POSSE
HERRERA
RUIZ

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
No. 13-283336- -00000-0000
Fecha: 2013-12-03 14:15:50 Dep. 2020 DIR.NUEVASCR
Tra. 11 PATENTEIYII Eve: 378 FASENACIONALI
Act. 411 PRESENTACION Folios: 372

Industria y Comercio
SUPERINTENDENCIA

DELEGATURA DE NUEVAS CREACIONES

SOLICITUD
FASE NACIONAL -PCT

21. EXPEDIENTE No. _____

54. TITULO: COMBINACIONES DE PRINCIPIOS ACTIVOS

51. CLASIFICACION INTERNACIONAL:
A01N 43/78 (2006.01) A01N 43/80 (2006.01)
A01P 3/00 (2006.01) C07D 417/14 (2006.01)
A01N 25/00 (2006.01)

71. SOLICITANTE: BAYER INTELLECTUAL PROPERTY GMBH

DOMICILIO: Alfred Nobel Strasse 10, Monheim am Rhein ALEMANIA

74. APODERADO: ERNESTO CAVELIER FRANCO

22. BOGOTÁ D.C., DICIEMBRE 3 DE 2013

C1

Industria y Comercio
SUPERINTENDENCIA

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DIRECCIÓN DE NUEVAS CREACIONES
SOLICITUD FASE NACIONAL –PCT

1	**TIPO DE SOLICITUD**	☒ Patente de invención ☒ Capítulo I	☐ Patente de Modelo de Utilidad ☐ Capitulo II

2 DATOS SOLICITUD INTERNACIONAL PCT (86)

Solicitud Internacional No.	**PCT/EP2012/060508**	**Fecha**	04/06/2012
Publicación Internacional No.	**WO 2012/168188 A1**	**Fecha**	13/12/2012

3 TÍTULO DE LA INVENCIÓN (200 caracteres o espacios máximos)

COMBINACIONES DE PRINCIPIOS ACTIVOS

4 CLASIFICACIÓN INTERNACIONAL (CIP)

A01N 43/78 (2006.01) ***A01N 43/80*** (2006.01) ***A01P 3/00*** (2006.01) ***C07D 417/14*** (2006.01) ***A01N 25/00*** (2006.01)

SOLICITANTE (S) Esta persona también es inventor. Para datos adicionales utilizar hoja de información complementaria

	APELLIDOS O RAZÓN SOCIAL	NOMBRE	IDENTIFICACIÓN	TIPO
1	**BAYER INTELLECTUAL PROPERTY GMBH**			

6 DATOS DEL SOLICITANTE

DIRECCIÓN	**Alfred Nobel Strasse 10, Monheim am Rhein**	No. TELÉFONO	
CIUDAD	**Monheim am Rhein**	CORREO ELECTRÓNICO	
DEPARTAMENTO/ESTADO		NACIONALIDAD O LUGAR DE CONSTITUCIÓN	**ALEMANIA**
PAÍS DE RESIDENCIA	**ALEMANIA**		

7 INVENTOR (ES) Para datos adicionales utilizar hoja de información complementaria

APELLIDOS	NOMBRES	NACIONALIDAD
1. HOFFMANN	**Sebastian**	**ALEMANIA**
2. WASNAIRE	**Pierre**	**BELGICA**
3. WACHENDORFF-NEUMANN	**Ulrike**	**ALEMANIA**

DIRECCIÓN DE CORREO ELECTRÓNICO:

8 DATOS INVENTOR (ES)

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2. Alemania		**2. Düsseldorf**	**2. Christophstr. 55, 40225**
3. Alemania		**3. Neuwied**	**3. Oberer Markenweg 85, 56566**

OTRO(S) SOLICITANTE(S) Y/O (OTRO(S)) INVENTOR(ES)

☐ Los demás solicitantes y/o (demás) inventores se indican en una hoja a continuación.

9 ☐ **REPRESENTANTE LEGAL** ☒ **APODERADO**

APELLIDOS	NOMBRES	IDENTIFICACIÓN
CAVELIER FRANCO	**ERNESTO**	**C.C 19.081.620 T.P 11519**

DIRECCIÓN	**CARRERA 7 Nº 71 – 52, TORRE A, PISO 5**	No. TELÉFONO	**3257300**
CIUDAD	**BOGOTÁ**	CORREO ELECTRÓNICO	**ernesto.cavelier@phrlegal.com**
PAÍS	**COLOMBIA**	No. RADICACIÓN DE PROTOCOLO DE PODER GENERAL	**PODER PROT. 13 102341**

10 DECLARACIONES DE PRIORIDAD ☒ SI ☐ NO

(33) PAÍS DE ORIGEN	CÓDIGO PAÍS	(31) NÚMERO	(32) FECHA (AAAA/MM/DD)
1. COMUNIDAD EUROPEA		**11168904.8**	**07/06/2011**
2. ESTADOS UNIDOS DE AMERICA		**61/494,105**	**07/06/2011**

11	DECLARACIÓN SOBRE USO DE RECURSOS GENÉTICOS O BIOLÓGICOS

Declaro que el objeto de la presente solicitud de patente fue obtenido a partir de recursos genéticos o biológicos de los que cualquiera de los países miembros de la Comunidad Andina es país de origen.

☐ SI ☒ NO

12	DECLARACIÓN SOBRE USO DE CONOCIMIENTOS TRADICIONALES

Declaro que el objeto de la presente solicitud de patente fue obtenido a partir de conocimientos tradicionales de comunidades indígenas, afroamericanas o locales de países miembros de la Comunidad Andina.

☐ SI ☒ NO

13	REDUCCIÓN DE TASAS

Declaro que carezco de medios económicos para presentar la solicitud de patente.

☐ SI ☒ NO

Micro, pequeñas y medianas empresas ☐
Universidades públicas o privadas ☐
Entidades sin ánimo de lucro ☐

Debe aportar los documentos que se indican en el numeral 17 de anexos

14	AUTORIZACIÓN DE NOTIFICACIÓN EN LÍNEA ☒ SI ☐ NO

Manifiesto que he leído y entendido perfectamente los términos y condiciones de uso de medios electrónicos para las notificaciones en línea a través de Internet de los actos administrativos proferidos por la Superintendencia de Industria y Comercio que deben ser notificados personalmente y, en consecuencia, autorizo el servicio de notificación a través de internet.

15	COMPROBANTE DE PAGO O PAGO ELECTRÓNICO	N°	Fecha

16	FIRMA DEL SOLICITANTE, DEL APODERADO O DEL REPRESENTANTE LEGAL *Junto a cada firma, indicar el nombre del firmante y su calidad (si tal calidad no es obvia al leer el petitorio)*

Ernesto Cavelier

ERNESTO CAVELIER FRANCO

17	ANEXOS

Documentación Técnica
Solicitud Internacional en castellano

1. ☒ Descripción — N° de folios:
2. ☒ Reivindicaciones — N° Reivindicaciones:
3. ☒ Dibujos y/o figuras — N° folios:
4. ☒ Resumen.
5. ☐ Certificado de depósito de material biológico si fuera el caso.
6. ☐ Listado de secuencias de nucleótidos y/o aminoácidos en forma digital si fuera el caso.
7. ☐ Arte final 12 x 12.
8. ☐ Anexo formato digital.

Documentación Jurídica

9. ☐ Poderes, si fuera el caso, PODER PROT. 13 102341
10. ☐ Documento que legalmente pruebe la cesión del inventor al solicitante o a su causante.
11. ☐ Copia del contrato de acceso de recursos genéticos o productos derivados, *certificado o número de registro, si fuera el caso.*
12. ☐ Copia de la licencia o autorización de Conocimientos Tradicionales, certificado o número de registro, si fuera el caso.
13. **Reducción de tasas**

Micro, pequeñas o medinas empresas

☐ Copia simple de la declaración de renta del año inmediatamente anterior, o en su defecto prueba documental idónea.

☐ Documento de constancia de cumplimiento con lo establecido en la ley 905 de 2004.

Universidades públicas o privadas

☐ Copia acto de reconocimiento institucional emitido por el Ministerio de Educación

Entidades sin ánimo de lucro

☐ Copia de registro vigente en Cámara de comercio.
☐ Hoja de información complementaria.
☐ Otros, especificar

14. ☒ Comprobante de pago de la tasa de presentación de la solicitud.
15. ☐ Comprobante de pago por reivindicación de prioridad.
16. ☒ Comprobante de pago de la tasa por concepto de excedente de palabras en la publicación.
17. ☒ Comprobante de pago por reivindicación adicional a 10.

Combinaciones de principios activos

La presente invención se refiere a combinaciones de principios activos, en particular dentro de una composición fungicida, que comprende (A) un tiazolilisoxazolina de fórmula (I) y otro compuesto fúngicamente activo (B). Además, la invención se refiere a un procedimiento para controlar de forma curativa o preventiva los hongos fitopatógenos de plantas o cultivos, al uso de una combinación de acuerdo con la invención para el tratamiento de semillas, a un procedimiento para proteger una semilla y no al menos para la semilla tratada.

Ya es conocido que se pueden usar determinadas tiazolilisoxazolinas como fungicidas (véanse los documentos WO08/013925, WO WO09/094407, WO09/094445, WO09/055514 y PCT/EP2010/070156).

Puesto que los requisitos ambientales y económicos impuestos en las composiciones de protección de cultivos de hoy en día se están incrementando continuamente , con respecto, por ejemplo, al espectro de acción, toxicidad, selectividad, tasa de aplicación, formación de residuos, y capacidad de preparación favorable, y puesto que, además, puede haber problemas, por ejemplo, con resistencias, una tarea constante es la de desarrollar nuevas composiciones, en particular agentes fungicidas, que, en algunas áreas, al menos ayuden a cumplir con los requisitos mencionados anteriormente.

La presente invención proporciona combinaciones/composiciones de principios activos que en algunos aspectos al menos logran el objetivo establecido.

Ahora se ha descubierto, sorprendentemente, que las combinaciones de acuerdo con la invención no sólo producen la potenciación aditiva del espectro de acción con respecto al fitopatógeno que se ha de controlar que en principio era lo esperado sino que logra un efecto sinérgico que extiende el intervalo de acción del componente (A) y del componente (B) de dos formas. En primer lugar, las tasas de aplicación del componente (A) y del componente (B) se disminuyen mientras que la acción permanece igual de buena. En segundo lugar, la combinación aún logra

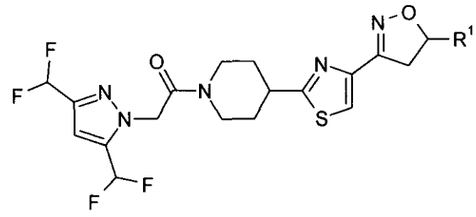
un alto grado de control fitopatógeno aún cuando los dos compuestos individuales se han vuelto totalmente ineficaces en un intervalo de tasa de aplicación bajo de este tipo. Esto permite, por un lado, una ampliación sustancial del espectro de fitopatógenos que se pueden controlar y, por otro lado, un incremento en la seguridad en uso.

Además de la actividad sinérgica fungicida, combinaciones de principios activos de acuerdo con la invención tienen otras propiedades sorprendentes que, en un sentido más amplio, también se pueden denominar sinérgicas, tales como, por ejemplo: ampliación del espectro de actividad para otros fitopatógenos, por ejemplo para cepas resistentes de emulsionantes de plantas; menores tasas de aplicación de los principios activos; control suficiente de plagas con la ayuda de las combinaciones de principios activos de acuerdo con la invención incluso en tasas de aplicación en las que los compuestos individuales no muestran ninguna o virtualmente ninguna actividad; comportamiento ventajoso durante la formulación o durante el uso, por ejemplo durante la molienda, tamizado, emulsionado, disolución o dispensación; mejora de la estabilidad en almacenamiento y estabilidad a la luz; formación de residuo ventajosa; mejora en el comportamiento toxicológico o ecotoxicológico; mejora en las propiedades de la planta, por ejemplo un mejor crecimiento, incremento en los rendimientos de las cosechas, un mejor sistema de raíces desarrolladas, un mayor área de la hoja, hojas más verdes, brotes más fuertes, menos semillas requeridas, menor fitotoxicidad, movilización del sistema de defensa de la planta, buena compatibilidad con plantas. Por tanto, el uso de las combinaciones o composiciones de principios activos de acuerdo con la invención contribuye considerablemente a mantener el cereal tierno más sanos, lo que incrementa, por ejemplo, la supervivencia en invierno de la semilla de cereal tratada, y también garantiza la calidad y el rendimiento. Además, las combinaciones de principios activos de acuerdo con la invención pueden contribuir a una potenciación de la acción sistémica. Incluso si los compuestos individuales de la combinación no tienen propiedades sistémicas suficientes, las

combinaciones de principios activos de acuerdo con la invención todavía pueden tener esta propiedad. De manera similar, las combinaciones de principios activos de acuerdo con la invención pueden dar como resultado una mayor persistencia de la acción fungicida.

En consecuencia, la presente invención proporciona una combinación que comprende:

(A) al menos una tiazolilisoxazolina de fórmula **(I)**



(I)

en la que

R^1 representa fenilo, que está al menos sustituido con un prop-2-en-1-iloxi y opcionalmente está sustituido adicionalmente con uno, dos o tres sustituyentes seleccionados del grupo que consiste en metilo, metoxi, fluoro o cloro

o una sal agroquímicamente aceptable del mismo,

y

(B) al menos un principio activo adicional seleccionado de los siguientes grupos

(1) inhibidores de la síntesis de ergosterol,

(2) inhibidores de la cadena respiratoria en el complejo I o II,

(3) inhibidores de la cadena respiratoria en el complejo III,

(4) inhibidores de la mitosis y división celular,

(5) compuestos que pueden tener una acción multisitio,

(6) compuestos que pueden inducir una defensa de huésped,

(7) inhibidores de la biosíntesis de aminoácidos y/o proteínas,

(8) inhibidores de la producción de ATP,

(9) inhibidores de la síntesis de la pared celular,

(10) inhibidores de la síntesis de lípidos y membranas,

(11) inhibidores de la biosíntesis de melanina,

(12) inhibidores de la síntesis de ácidos nucleicos,

(13) inhibidores de la transducción de señal,

(14) compuestos que pueden actuar como desacoplador,

(15) otros fungicidas.

Se da preferencia a combinaciones que comprenden al menos un compuesto de la fórmula (I) seleccionado del grupo que consiste en

(I-1) 2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[2-(prop-2-en-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona,

(I-2) 2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[4-(prop-2-en-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona,

(I-3) 2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[3-(prop-2-en-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona,

(I-4) 2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[2,6-difluoro-4-(prop-2-en-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona,

(I-5) 2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[2-fluoro-6-(prop-2-en-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona,

(I-6) 2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[2-cloro-6-(prop-2-en-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona,

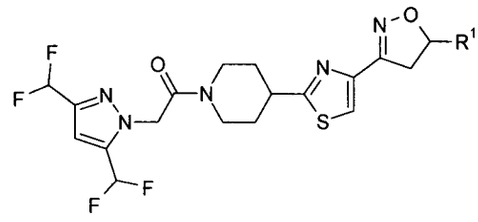
(I-7) 2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[2,6-difluoro-3-(prop-2-en-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona,

(I-8) 2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[5-fluoro-2-(prop-2-en-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona,

(I-9) 2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[4-metoxi-2-(prop-2-en-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona,

(I-10) 2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[3-fluoro-2-(prop-2-en-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona.

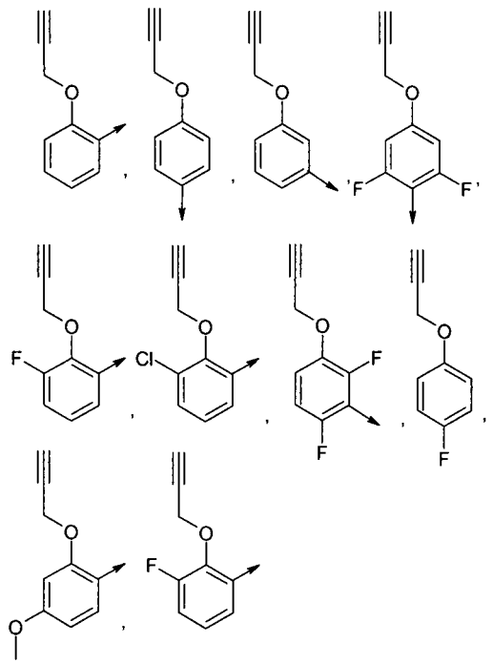
La presente invención también se refiere a tiazolilisoxazolina de la fórmula **(I)**



(I)

en la que

R^1 es



La tiazolilisoxazolina de fórmula (I) de acuerdo con la presente invención es:

(I-1) 2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[2-(prop-2-en-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona,

(I-2) 2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[4-(prop-2-en-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona,

(I-3) 2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[3-(prop-2-en-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona,

(I-4) 2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[2,6-difluoro-4-(prop-2-en-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona,

(I-5) 2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[2-fluoro-6-(prop-2-en-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona,

(I-6) 2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[2-cloro-6-(prop-2-en-1-

iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona,

(I-7) 2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[2,6-difluoro-3-(prop-2-en-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona,

(I-8) 2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[5-fluoro-2-(prop-2-en-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona,

(I-9) 2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[4-metoxi-2-(prop-2-en-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona,

(I-10) 2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[3-fluoro-2-(prop-2-en-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona.

En la descripción a continuación, los números en paréntesis después de un nombre de compuesto representan el número de registro CAS de dicho compuesto.

Se da preferencia además a combinaciones que comprenden al menos un principio activo adicional (B) seleccionado de los siguientes grupos:

(1) Inhibidores de la biosíntesis de ergosterol, por ejemplo (1.1) aldimorph (1704-28-5), (1.2) azaconazol (60207-31-0), (1.3) bitertanol (55179-31-2), (1.4) bromuconazol (116255-48-2), (1.5) ciproconazol (113096-99-4), (1.6) diclobutrazol (75736-33-3), (1.7) difenoconazol (119446-68-3), (1.8) diniconazol (83657-24-3), (1.9) diniconazol-M (83657-18-5), (1.10) dodemorph (1593-77-7), (1.11) acetato de dodemorph (31717-87-0), (1.12) epoxiconazol (106325-08-0), (1.13) etaconazol (60207-93-4), (1.14) fenarimol (60168-88-9), (1.15) fenbuconazol (114369-43-6), (1.16) fenhexamida (126833-17-8), (1.17) fenpropidin (67306-00-7), (1.18) fenpropimorph (67306-03-0), (1.19) fluquinconazol (136426-54-5), (1.20) flurprimidol (56425-91-3), (1.21) flusilazol (85509-19-9), (1.22) flutriafol (76674-21-0), (1.23) furconazol (112839-33-5), (1.24) furconazol-cis (112839-32-4), (1.25) hexaconazol (79983-71-4), (1.26) imazalilo (60534-80-7), (1.27) sulfato de imazalilo (58594-72-2), (1.28) imibenconazol (86598-92-7), (1.29) ipconazol (125225-28-7), (1.30) metconazol (125116-23-6), (1.31) miclobutanilo (88671-89-0), (1.32) naftifina (65472-88-0), (1.33) nuarimol (63284-71-9), (1.34) oxpoconazol

(174212-12-5), (1.35) paclobutrazol (76738-62-0), (1.36) pefurazoato (101903-30-4), (1.37) penconazol (66246-88-6), (1.38) piperalin (3478-94-2), (1.39) procloraz (67747-09-5), (1.40) propiconazol (60207-90-1), (1.41) protioconazol (178928-70-6), (1.42) piributicarb (88678-67-5), (1.43) pirifenox (88283-41-4), (1.44) quinconazol (103970-75-8), (1.45) simeconazol (149508-90-7), (1.46) espiroxamina (118134-30-8), (1.47) tebuconazol (107534-96-3), (1.48) terbinafina (91161-71-6), (1.49) tetraconazol (112281-77-3), (1.50) triadimefon (43121-43-3), (1.51) triadimenol (89482-17-7), (1.52) tridemorph (81412-43-3), (1.53) triflumizol (68694-11-1), (1.54) triforina (26644-46-2), (1.55) triticonazol (131983-72-7), (1.56) uniconazol (83657-22-1), (1.57) uniconazol-p (83657-17-4), (1.58) viniconazol (77174-66-4), (1.59) voriconazol (137234-62-9), (1.60) 1-(4-clorofenil)-2-(1H-1,2,4-triazol-1-il)cicloheptanol (129586-32-9), (1.61) 1-(2,2-dimetil-2,3-dihidro-1H-inden-1-il)-1H-imidazol-5-carboxilato de metilo (110323-95-0), (1.62) N'-{5-(difluorometil)-2-metil-4-[3-(trimetilsilil)propoxi]fenil}-N-etil-N-metilimidoformamida, (1.63) N-etil-N-metil-N'-{2-metil-5-(trifluorometil)-4-[3-(trimetilsilil)propoxi]fenil}imidoformamida y (1.64) O-[1-(4-metoxifenoxi)-3,3-dimetilbutan-2-il] 1H-imidazol-1-carbotioato (111226-71-2).

(2) inhibidores de la cadena respiratoria en el complejo I o II, por ejemplo (2.1) bixafeno (581809-46-3), boscalid (188425-85-6), (2.3) carboxina (5234-68-4), (2.4) diflumetorim (130339-07-0), (2.5) fenfuram (24691-80-3), (2.6) fluopiram (658066-35-4), (2.7) flutolanilo (66332-96-5), (2.8) fluxapiroxad (907204-31-3), (2.9) furametpir (123572-88-3), (2.10) furmeciclox (60568-05-0), (2.11) isopirazam (mezcla de racemato syn-epimérico 1RS,4SR,9RS y racemato anti-epimérico 1RS,4SR,9SR) (881685-58-1), (2.12) isopirazam (racemato anti-epimérico 1RS,4SR,9SR), (2.13) isopirazam (enantiómero anti-epimérico 1R,4S,9S), (2.14) isopirazam (enantiómero anti-epimérico 1S,4R,9R), (2.15) isopirazam (racemato syn-epimérico 1RS,4SR,9RS), (2.16) isopirazam (enantiómero syn-epimérico 1R,4S,9R), (2.17) isopirazam (enantiómero syn-epimérico 1S,4R,9S), (2.18) mepronilo (55814-41-0), (2.19) oxicarboxina (5259-88-1), (2.20) penflufeno

(494793-67-8), (2.21) pentiopirad (183675-82-3), (2.22) sedaxano (874967-67-6), (2.23) tifluzamida (130000-40-7), (2.24) 1-metil-N-[2-(1,1,2,2-tetrafluoroetoxi)fenil]-3-(trifluorometil)-1H-pirazol-4-carboxamida, (2.25) 3-(difluorometil)-1-metil-N-[2-(1,1,2,2-tetrafluoroetoxi)fenil]-1H-pirazol-4-carboxamida, (2.26) 3-(difluorometil)-N-[4-fluoro-2-(1,1,2,3,3,3-hexafluoropropoxi)fenil]-1-metil-1H-pirazol-4-carboxamida, (2.27) N-[1-(2,4-diclorofenil)-1-metoxipropan-2-il]-3-(difluorometil)-1-metil-1H-pirazol-4-carboxamida (1092400-95-7) (documento WO 2008148570), (2.28) 5,8-difluoro-N-[2-(2-fluoro-4-{[4-(trifluorometil)piridin-2-il]oxi}fenil)etil]quinazolin-4-amina (1210070-84-0) (documento WO2010025451), (2.29) N-[9-(diclorometilen)-1,2,3,4-tetrahidro-1,4-metanonaftalen-5-il]-3-(difluorometil)-1-metil-1H-pirazol-4-carboxamida, (2.30) N-[(1S,4R)-9-(diclorometilen)-1,2,3,4-tetrahidro-1,4-metanonaftalen-5-il]-3-(difluorometil)-1-metil-1H-pirazol-4-carboxamida y (2.31) N-[(1R,4S)-9-(diclorometilen)-1,2,3,4-tetrahidro-1,4-metanonaftalen-5-il]-3-(difluorometil)-1-metil-1H-pirazol-4-carboxamida.

(3) inhibidores de la cadena respiratoria en el complejo III, por ejemplo (3.1) ametoctradina, (865318-97-4), (3.2) amisulbrom (348635-87-0), (3.3) azoxiestrobina (131860-33-8), (3.4) ciazofamid (120116-88-3), (3.5) coumetoxiestrobina (850881-30-0), (3.6) coumoxiistrobina (850881-70-8), (3.7) dimoxiestrobina (141600-52-4), (3.8) enestroburina (238410-11-2) (documento WO 2004/058723), (3.9) famoxadona (131807-57-3) (documento WO 2004/058723), (3.10) fenamidona (161326-34-7) (WO 2004/058723), (3.11) fenoxiestrobina (918162-02-4), (3.12) fluoxaestrobina (361377-29-9) (WO 2004/058723), (3.13) kresoximetilo (143390-89-0) (documento WO 2004/058723), (3.14) metominoestrobina (133408-50-1) (documento WO 2004/058723), (3.15) orisaestrobina (189892-69-1) (documento WO 2004/058723), (3.16) picoxiestrobina (117428-22-5) (documento WO 2004/058723), (3.17) piracloestrobina (175013-18-0) (documento WO 2004/058723), (3.18) pirametoestrobina (915410-70-7) (documento WO 2004/058723), (3.19) piraoxiestrobina (862588-11-2) (documento WO 2004/058723), (3.20) piribencarb

(799247-52-2) (documento WO 2004/058723), (3.21) triclopiricarb (902760-40-1), (3.22) trifloxiestrobina (141517-21-7) (documento WO 2004/058723), (3.23) (2E)-2-(2-{[6-(3-cloro-2-metilfenoxi)-5-fluoropirimidin-4-il]oxi}fenil)-2-(metoxiimino)-N-metiletanamida (documento WO 2004/058723), (3.24) (2E)-2-(metoxiimino)-N-metil-2-(2-{[({(1E)-1-[3-(trifluorometil)fenil]etiliden}amino)oxi]metil}fenil)etanamida (documento WO 2004/058723), (3.25) (2E)-2-(metoxiimino)-N-metil-2-{2-[(E)-({1-[3-(trifluorometil)fenil]etoxi}imino)metil]fenil}etanamida (158169-73-4), (3.26) (2E)-2-{2-[({[(1E)-1-(3-{[(E)-1-fluoro-2-feniletenil]oxi}fenil)etiliden]amino}oxi)metil]fenil}-2-(metoxiimino)-N-metiletanamida (326896-28-0), (3.27) (2E)-2-{2-[({[(2E,3E)-4-(2,6-diclorofenil)but-3-en-2-iliden]amino}oxi)metil]fenil}-2-(metoxiimino)-N-metiletanamida, (3.28) 2-cloro-N-(1,1,3-trimetil-2,3-dihidro-1H-inden-4-il)piridin-3-carboxamida (119899-14-8), (3.29) 5-metoxi-2-metil-4-(2-{[({(1E)-1-[3-(trifluorometil)fenil]etiliden}amino)oxi]metil}fenil)-2,4-dihidro-3H-1,2,4-triazol-3-ona, (3.30) (2E)-2-{2-[({ciclopropil[(4-metoxifenil)imino]metil}sulfanil)metil]fenil}-3-metoxiprop-2-enoato de metilo (149601-03-6), (3.31) N-(3-etil-3,5,5-trimetilciclohexil)-3-(formilamino)-2-hidroxibenzamida (226551-21-9), (3.32) 2-{2-[(2,5-dimetilfenoxi)metil]fenil}-2-metoxi-N-metilacetamida (173662-97-0) y (3.33) (2R)-2-{2-[(2,5-dimetilfenoxi)metil]fenil}-2-metoxi-N-metilacetamida (394657-24-0).

(4) Inhibidores de la mitosis y la división celular, por ejemplo (4.1) benomilo (17804-35-2), (4.2) carbendazim (10605-21-7), (4.3) clorfenazol (3574-96-7), (4.4) dietofencarb (87130-20-9), (4.5) etaboxam (162650-77-3), (4.6) fluopicolida (239110-15-7), (4.7) fuberidazol (3878-19-1), (4.8) pencicuron (66063-05-6), (4.9) tiabendazol (148-79-8), (4.10) tiofanato-metilo (23564-05-8), (4.11) tiofanato (23564-06-9), (4.12) zoxamida (156052-68-5), (4.13) 5-cloro-7-(4-metilpiperidin-1-il)-6-(2,4,6-trifluorofenil)[1,2,4]triazolo[1,5-a]pirimidina (214706-53-3) y (4.14) 3-cloro-5-(6-cloropiridin-3-il)-6-metil-4-(2,4,6-trifluorofenil)piridazina (1002756-87-7).

(5) Compuestos que pueden tener una acción multisitio, como, por ejemplo, (5.1) caldo bordelés (8011-63-0), (5.2) captafol (2425-06-1), (5.3) captan (133-06-2) (WO 02/12172), (5.4) clorotalonilo (1897-45-6), (5.5) hidróxido de cobre (20427-

59-2), (5.6) naftenato de cobre (1338-02-9), (5.7) óxido de cobre (1317-39-1), (5.8) oxicloruro de cobre (1332-40-7), (5.9) sulfato de cobre (2+) (7758-98-7), (5.10) diclofluanid (1085-98-9), (5.11) ditianon (3347-22-6), (5.12) dodina (2439-10-3), (5.13) base libre de dodina, (5.14) ferbam (14484-64-1), (5.15) fluorofolpet (719-96-0), (5.16) folpet (133-07-3), (5.17) guazatina (108173-90-6), (5.18) acetato de guazatina, (5.19) iminoctadina (13516-27-3), (5.20) albesilato de iminoctadina (169202-06-6), (5.21) triacetato de iminoctadina (57520-17-9), (5.22) mancopper (53988-93-5), (5.23) mancozeb (8018-01-7), (5.24) maneb (12427-38-2), (5.25) metiram (9006-42-2), (5.26) metiram cinc (9006-42-2), (5.27) oxina-cobre (10380-28-6), (5.28) propamidina (104-32-5), (5.29) propineb (12071-83-9), (5.30) azufre y preparaciones de azufre, incluidas polisulfuro de calcio (7704-34-9), (5.31) tiram (137-26-8), (5.32) tolilfluanid (731-27-1), (5.33) zineb (12122-67-7) y (5.34) ziram (137-30-4).

6) Compuestos que pueden inducir una defensa del huésped, como por ejemplo (6.1) acibenzolar-S-metilo (135158-54-2), (6.2) isotianilo (224049-04-1), (6.3) probenazol (27605-76-1) y (6.4) tiadinilo (223580-51-6).

(7) Inhibidores de la biosíntesis de aminoácidos y/o proteínas, por ejemplo (7.1) andoprim (23951-85-1), (7.2) blasticidina-S (2079-00-7), (7.3) ciprodinilo (121552-61-2), (7.4) kasugamicina (6980-18-3), (7.5) kasugamicina clorhidrato hidrato (19408-46-9), (7.6) mepanipirim (110235-47-7), (7.7) pirimetanilo (53112-28-0) y (7.8) 3-(5-fluoro-3,3,4,4-tetrametil-3,4-dihidroisoquinolin-1-il)quinolina (861647-32-7) (documento WO2005070917).

(8) Inhibidores de la producción de ATP, por ejemplo (8.1) acetato de sentina 900-95-8), (8.2) cloruro de sentina (639-58-7), (8.3) hidróxido de fentina (76-87-9) y (8.4) siltiofam (175217-20-6).

(9) Inhibidores de la síntesis de la pared celular, por ejemplo (9.1) bentiavalicarb (177406-68-7), (9.2) dimetomorf (110488-70-5), (9.3) flumorf (211867-47-9), (9.4) iprovalicarb (140923-17-7), (9.5) mandipropamid (374726-62-2), (9.6) polioxinas (11113-80-7), (9.7) polioxorim (22976-86-9), (9.8) validamicina A (37248-47-8) y

(9.9) valifenalato (283159-94-4; 283159-90-0).

(10) Inhibidores de la síntesis de lípidos y de membrana, por ejemplo (10.1) bifenil (92-52-4), (10.2) cloroneb (2675-77-6), (10.3) dicloran (99-30-9), (10.4) edifenfos (17109-49-8), (10.5) etridiazol (2593-15-9), (10.6) iodocarb (55406-53-6), (10.7) iprobenfos (26087-47-8), (10.8) isoprotiolano (50512-35-1), (10.9) propamocarb (25606-41-1), (10.10) propamocarb clorhidrato (25606-41-1), (10.11) protiocarb (19622-08-3), (10.12) pirazofos (13457-18-6), (10.13) quintozeno (82-68-8), (10.14) tecnazeno (117-18-0) y (10.15) tolclofos-metilo (57018-04-9).

(11) Inhibidores de la biosíntesis de melanina, por ejemplo (11.1) carpropamid (104030-54-8), (11.2) diclocimet (139920-32-4), (11.3) fenoxanilo (115852-48-7), (11.4) ftalida (27355-22-2), (11.5) piroquilon (57369-32-1), (11.6) triciclazol (41814-78-2) y (11.7) {3-metil-1-[(4-metilbenzoil)amino]butan-2-il}carbamato de 2,2,2-trifluoroetilo (851524-22-6) (documento WO2005042474)

(12) Inhibidores de la síntesis de ácidos nucleicos, por ejemplo (12.1) benalaxilo (71626-11-4), (12.2) benalaxil-M (kiralaxilo) (98243-83-5), (12.3) bupirimato (41483-43-6), (12.4) clozilacon (67932-85-8), (12.5) dimetirimol (5221-53-4), (12.6) etirimol (23947-60-6), (12.7) furalaxilo (57646-30-7), (12.8) himexazol (10004-44-1), (12.9) metalaxilo (57837-19-1), (12.10) metalaxil-M (mefenoxam) (70630-17-0), (12.11) ofurace (58810-48-3), (12.12) oxadixilo (77732-09-3) y (12.13) ácido oxolínico (14698-29-4).

(13) Inhibidores de la transducción de señal, por ejemplo 13.1) clozolinato (84332-86-5), (13.2) fenpiclonilo (74738-17-3), (13.3) fludioxonilo (131341-86-1), (13.4) iprodiona (36734-19-7), (13.5) procimidona (32809-16-8), (13.6) quinoxifen (124495-18-7) y (13.7) vinclozolina (50471-44-8).

(14) Compuestos que pueden actuar como desacoplador, como por ejemplo (14.1) binapacrilo (485-31-4), (14.2) dinocap (131-72-6), (14.3) ferimzona (89269-64-7), (14.4) fluazinam (79622-59-6) y (14.5) meptildinocap (131-72-6).

(15) Otros compuestos, como por ejemplo bentiazol (21564-17-0), (15.2) betoxazina (163269-30-5), (15.3) capsimicina (70694-08-5), (15.4) carvona (99-49-

0), (15.5) cinometionat (2439-01-2), (15.6) piriofenona (clazafenona) (688046-61-9), (15.7) cufraneb (11096-18-7), (15.8) ciflufenamid (180409-60-3), (15.9) cimoxanilo (57966-95-7), (15.10) ciprosulfamida (221667-31-8), (15.11) dazomet (533-74-4), (15.12) debacarb (62732-91-6), (15.13) diclorofen (97-23-4), (15.14) diclomezina (62865-36-5), (15.15) difenzoquat (49866-87-7), (15.16) difenzoquat metilsulfato (43222-48-6), (15.17) difenilamina (122-39-4), (15.18) ecomato, (15.19) fenpirazamina (473798-59-3), (15.20) flumetover (154025-04-4), (15.21) fluoroimida (41205-21-4), (15.22) flusulfamida (106917-52-6), (15.23) flutianilo (304900-25-2), (15.24) fosetil-aluminio (39148-24-8), (15.25) fosetil-calcio, (15.26) fosetil-sodio (39148-16-8), (15.27) hexaclorobenceno (118-74-1), (15.28) irumamicina (81604-73-1), (15.29) metasulfocarb (66952-49-6), (15.30) isotiocianato de metilo (556-61-6), (15.31) metrafenona (220899-03-6), (15.32) mildiomicina (67527-71-3), (15.33) natamicina (7681-93-8), (15.34) dimetilditiocarbamato de níquel (15521-65-0), (15.35) nitrotal-isopropilo (10552-74-6), (15.36) octilinona (26530-20-1), (15.37) oxamocarb (917242-12-7), (15.38) oxifentiina (34407-87-9), (15.39) pentaclorofenol y sales (87-86-5), (15.40) fenotrin, (15.41) ácido fosforoso y sus sales (13598-36-2), (15.42) propamocarb-fosetilato, (15.43) propanosina-sodio (88498-02-6), (15.44) proquinazid (189278-12-4), (15.45) pirimorf (868390-90-3), (15.45e) (2E)-3-(4-terc-butilfenil)-3-(2-cloropiridin-4-il)-1-(morfolin-4-il)prop-2-en-1-ona (1231776-28-5), (15.45z) (2Z)-3-(4-terc-butilfenil)-3-(2-cloropiridin-4-il)-1-(morfolin-4-il)prop-2-en-1-ona (1231776-29-6), (15.46) pirrolnitrina (1018-71-9) (EP-A 1 559 320), (15.47) tebufloquina (376645-78-2), (15.48) tecloftalam (76280-91-6), (15.49) tolnifanida (304911-98-6), (15.50) triazoxida (72459-58-6), (15.51) triclamida (70193-21-4), (15.52) zarilamid (84527-51-5), (15.53) (3S,6S,7R,8R)-8-bencil-3-[({3-[(isobutiriloxi)metoxi]-4-metoxipiridin-2-il}carbonil)amino]-6-metil-4,9-dioxo-1,5-dioxonan-7-il 2-metilpropanoato (517875-34-2) (documento WO2003035617), (15.54) 1-(4-{4-[(5R)-5-(2,6-difluorofenil)-4,5-dihidro-1,2-oxazol-3-il]-1,3-tiazol-2-il}piperidin-1-il)-2-[5-metil-3-(trifluorometil)-1H-pirazol-1-il]etanona (1003319-79-6) (documento WO 2008013622), (15.55) 1-(4-

{4-[(5S)-5-(2,6-difluorofenil)-4,5-dihidro-1,2-oxazol-3-il]-1,3-tiazol-2-il}piperidin-1-il)-2-[5-metil-3-(trifluorometil)-1H-pirazol-1-il]etanona (1003319-80-9) (documento WO 2008013622), (15.56) 1-(4-{4-[5-(2,6-difluorofenil)-4,5-dihidro-1,2-oxazol-3-il]-1,3-tiazol-2-il}piperidin-1-il)-2-[5-metil-3-(trifluorometil)-1H-pirazol-1-il]etanona (1003318-67-9) (documento WO 2008013622), 1H-imidazol-1-carboxilato de (15.57) 1-(4-metoxifenoxi)-3,3-dimetilbutan-2-ilo (111227-17-9), (15.58) 2,3,5,6-tetracloro-4-(metilsulfonil)piridina (13108-52-6), (15.59) 2,3-dibutil-6-clorotieno[2,3-d]pirimidin-4(3H)-ona (221451-58-7), (15.60) 2,6-dimetil-1H,5H-[1,4]ditiino[2,3-c:5,6-c']dipirrole-1,3,5,7(2H,6H)-tetrona, (15.61) 2-[5-metil-3-(trifluorometil)-1H-pirazol-1-il]-1-(4-{4-[(5R)-5-fenil-4,5-dihidro-1,2-oxazol-3-il]-1,3-tiazol-2-il}piperidin-1-il)etanona (1003316-53-7) (documento WO 2008013622), (15.62) 2-[5-metil-3-(trifluorometil)-1H-pirazol-1-il]-1-(4-{4-[(5S)-5-fenil-4,5-dihidro-1,2-oxazol-3-il]-1,3-tiazol-2-il}piperidin-1-il)etanona (1003316-54-8) (documento WO 2008013622), (15.63) 2-[5-metil-3-(trifluorometil)-1H-pirazol-1-il]-1-{4-[4-(5-fenil-4,5-dihidro-1,2-oxazol-3-il)-1,3-tiazol-2-il]piperidin-1-il}etanona (1003316-51-5) (documento WO 2008013622), (15.64) 2-butoxi-6-iodo-3-propil-4H-cromen-4-ona, (15.65) 2-cloro-5-[2-cloro-1-(2,6-difluoro-4-metoxifenil)-4-metil-1H-imidazol-5-il]piridina, (15.66) 2-fenilfenol y sales (90-43-7), (15.67) 3-(4,4,5-trifluoro-3,3-dimetil-3,4-dihidroisoquinolin-1-il)quinolina (861647-85-0) (documento WO2005070917), (15.68) 3,4,5-tricloropiridina-2,6-dicarbonitrilo (17824-85-0), (15.69) 3-[5-(4-clorofenil)-2,3-dimetil-1,2-oxazolidin-3-il]piridina, (15.70) 3-cloro-5-(4-clorofenil)-4-(2,6-difluorofenil)-6-metilpiridazina, (15.71) 4-(4-clorofenil)-5-(2,6-difluorofenil)-3,6-dimetilpiridazina, (15.72) 5-amino-1,3,4-tiadiazol-2-tiol, (15.73) 5-cloro-N'-fenil-N'-(prop-2-en-1-il)tiofeno-2-sulfonohidrazida (134-31-6), (15.74) 5-fluoro-2-[(4-fluorobencil)oxi]pirimidin-4-amina (1174376-11-4) (documento WO2009094442), (15.75) 5-fluoro-2-[(4-metilbencil)oxi]pirimidin-4-amina (1174376-25-0) (documento WO2009094442), (15.76) 5-metil-6-octil[1,2,4]triazolo[1,5-a]pirimidin-7-amina, (15.77) etil (2Z)-3-amino-2-ciano-3-fenilprop-2-enoato, (15.78) N'-(4-{[3-(4-clorobencil)-1,2,4-tiadiazol-5-il]oxi}-2,5-dimetilfenil)-N-etil-N-metilimidoformamida,

(15.79) N-(4-clorobencil)-3-[3-metoxi-4-(prop-2-en-1-iloxi)fenil]propanamida, (15.80) N-[(4-clorofenil)(ciano)metil]-3-[3-metoxi-4-(prop-2-en-1-iloxi)fenil]propanamida, (15.81) N-[(5-bromo-3-cloropiridin-2-il)metil]-2,4-dicloropiridina-3-carboxamida, (15.82) N-[1-(5-bromo-3-cloropiridin-2-il)etil]-2,4-dicloropiridina-3-carboxamida, (15.83) N-[1-(5-bromo-3-cloropiridin-2-il)etil]-2-fluoro-4-iodopiridina-3-carboxamida, (15.84) N-{(E)-[(ciclopropilmetoxi)imino][6-(difluorometoxi)-2,3-difluorofenil]metil}-2-fenilacetamida (221201-92-9), (15.85) N-{(Z)-[(ciclopropilmetoxi)imino][6-(difluorometoxi)-2,3-difluorofenil]metil}-2-fenilacetamida (221201-92-9), (15.86) N'-{4-[(3-terc-butil-4-ciano-1,2-tiazol-5-il)oxi]-2-cloro-5-metilfenil}-N-etil-N-metilimidoformamida, (15.87) N-metil-2-(1-{[5-metil-3-(trifluorometil)-1H-pirazol-1-il]acetil}piperidin-4-il)-N-(1,2,3,4-tetrahidronaftalen-1-il)-1,3-tiazole-4-carboxamida (922514-49-6) (documento WO 2007014290), (15.88) N-metil-2-(1-{[5-metil-3-(trifluorometil)-1H-pirazol-1-il]acetil}piperidin-4-il)-N-[(1R)-1,2,3,4-tetrahidronaftalen-1-il]-1,3-tiazole-4-carboxamida (922514-07-6) (WO 2007014290), (15.89) N-metil-2-(1-{[5-metil-3-(trifluorometil)-1H-pirazol-1-il]acetil}piperidin-4-il)-N-[(1S)-1,2,3,4-tetrahidronaftalen-1-il]-1,3-tiazole-4-carboxamida (922514-48-5) (documento WO 2007014290), (15.90) {6-[({[(1-metil-1H-tetrazol-5-il)(fenil)metilidane]amino}oxi)metil]piridin-2-il}carbamato de pentilo, (15.91) ácido fenazina-1-carboxílico , (15.92) quinolin-8-ol (134-31-6), (15.93) quinolin-8-ol sulfato (2:1) (134-31-6) y (15.94) {6-[({[(1-metil-1H-tetrazol-5-il)(fenil)metilen]amino}oxi)metil]piridin-2-il}carbamato de terc-butilo.

(16) Compuestos adicionales como por ejemplo (16.1) 1-metil-3-(trifluorometil)-N-[2'-(trifluorometil)bifenil-2-il]-1H-pirazol-4-carboxamida, (16.2) N-(4'-clorobifenil-2-il)-3-(difluorometil)-1-metil-1H-pirazol-4-carboxamida, (16.3) N-(2',4'-diclorobifenil-2-il)-3-(difluorometil)-1-metil-1H-pirazol-4-carboxamida, (16.4) 3-(difluorometil)-1-metil-N-[4'-(trifluorometil)bifenil-2-il]-1H-pirazol-4-carboxamida, (16.5) N-(2',5'-difluorobifenil-2-il)-1-metil-3-(trifluorometil)-1H-pirazol-4-carboxamida, (16.6) 3-(difluorometil)-1-metil-N-[4'-(prop-1-en-1-il)bifenil-2-il]-1H-pirazol-4-carboxamida (conocida en el documento WO 2004/058723), (16.7) 5-fluoro-1,3-dimetil-N-[4'-

(prop-1-en-1-il)bifenil-2-il]-1H-pirazol-4-carboxamida (conocida en el documento WO 2004/058723), (16.8) 2-cloro-N-[4'-(prop-1-en-1-il)bifenil-2-il]piridin-3-carboxamida (conocida en el documento 2004/058723), (16.9) 3-(difluorometil)-N-[4'-(3,3-dimetilbut-1-en-1-il)bifenil-2-il]-1-metil-1H-pirazol-4-carboxamida (conocida en el documento WO 2004/058723), (16.10) N-[4'-(3,3-dimetilbut-1-en-1-il)bifenil-2-il]-5-fluoro-1,3-dimetil-1H-pirazol-4-carboxamida (conocida en el documento WO 2004/058723), (16.11) 3-(difluorometil)-N-(4'-etinilbifenil-2-il)-1-metil-1H-pirazol-4-carboxamida (conocida en el documento WO 2004/058723), (16.12) N-(4'-etinilbifenil-2-il)-5-fluoro-1,3-dimetil-1H-pirazol-4-carboxamida (conocida en el documento WO 2004/058723), (16.13) 2-cloro-N-(4'-etinilbifenil-2-il)piridin-3-carboxamida (conocida en el documento WO 2004/058723), (16.14) 2-cloro-N-[4'-(3,3-dimetilbut-1-en-1-il)bifenil-2-il]piridin-3-carboxamida (conocida en el documento WO 2004/058723), (16.15) 4-(difluorometil)-2-metil-N-[4'-(trifluorometil)bifenil-2-il]-1,3-tiazol-5-carboxamida (conocida en el documento WO 2004/058723), (16.16) 5-fluoro-N-[4'-(3-hidroxi-3-metilbut-1-en-1-il)bifenil-2-il]-1,3-dimetil-1H-pirazol-4-carboxamida (conocida en el documento WO 2004/058723), (16.17) 2-cloro-N-[4'-(3-hidroxi-3-metilbut-1-en-1-il)bifenil-2-il]piridin-3-carboxamida (conocida en el documento WO 2004/058723), (16.18) 3-(difluorometil)-N-[4'-(3-metoxi-3-metilbut-1-en-1-il)bifenil-2-il]-1-metil-1H-pirazol-4-carboxamida (conocida en el documento WO 2004/058723), (16.19) 5-fluoro-N-[4'-(3-metoxi-3-metilbut-1-en-1-il)bifenil-2-il]-1,3-dimetil-1H-pirazol-4-carboxamida (conocida en el documento WO 2004/058723), (16.20) 2-cloro-N-[4'-(3-metoxi-3-metilbut-1-en-1-il)bifenil-2-il]piridin-3-carboxamida (conocida en el documento WO 2004/058723), (16.21) (5-bromo-2-metoxi-4-metilpiridin-3-il)(2,3,4-trimetoxi-6-metilfenil)metanona (conocida en el documento EP-A 1 559 320), (16.22) N-[2-(4-{[3-(4-clorofenil)prop-2-en-1-il]oxi}-3-metoxifenil)etil]-N2-(metilsulfonil)valinamida (220706-93-4), (16.23) ácido 4-oxo-4-[(2-feniletil)amino]butanoico y (16.24) {6-[({[(Z)-(1-metil-1H-tetrazol-5-il)(fenil)metilen]amino}oxi)metil]piridin-2-il}carbamato de but-3-en-1-ilo.

Todos los compañeros de mezcla citados de las clases (1) a (16), si sus grupos

funcionales lo permiten, pueden formar opcionalmente sales con bases o ácidos adecuados.

Se da preferencia particular además a combinaciones que comprenden al menos un principio activo adicional (B) seleccionado de los siguientes grupos:

(2.1) bixafen, (2.2) boscalid, (2.6) fluopiram, (2.8) fluxapiroxad, (2.11) isopirazam (mezcla de racemato syn-epimérico 1RS,4SR,9RS y racemato anti-epimérico 1RS,4SR,9SR), (2.12) isopirazam (racemato anti-epimérico 1RS,4SR,9SR), (2.13) isopirazam (enantiómero anti-epimérico 1R,4S,9S), (2.14) isopirazam (enantiómero anti-epimérico 1S,4R,9R), (2.15) isopirazam (racemato syn-epimérico 1RS,4SR,9RS), (2.16) isopirazam (enantiómero syn-epimérico 1R,4S,9R), (2.17) isopirazam (enantiómero syn-epimérico 1S,4R,9S), (2.27) N-[1-(2.4-diclorofenil)-1-metoxipropan-2-il]-3-(difluorometil)-1-metil-1H-pirazole-4-carboxamida, (2.29) N-[9-(diclorometilen)-1,2,3,4-tetrahidro-1,4-metanonaftalen-5-il]-3-(difluorometil)-1-metil-1H-pirazole-4-carboxamida, (3.1) ametoctradin, (3.2) amisulbrom, (3.3) azoxistrobin, (3.4) cyazofamid, (3.9) famoxadone, (3.10) fenamidona, (3.12) fluoxastrobin, (3.16) picoxistrobin, (3.17) piraclostrobin, (3.22) trifloxistrobin, (4.6) fluopicolide, (5.1) caldo bordelés, (5.4) clorotalonilo, (5.5) hidróxido de cobre, (5.7) óxido de cobre, (5.8) oxicloruro de cobre , (5.9) sulfato de cobre (2+), (5.16) folpet, (5.23) mancozeb, (5.25) metiram, (5.26) metiram zinc, (5.29) propineb, (5.30) azufre y preparaciones de azufre incluyendo polisulfuro de calcio, (7.7) pirimetanilo, (9.2) dimetomorph, (9.4) iprovalicarb, (9.5) mandipropamid, (10.9) propamocarb, (10.10) propamocarb clorhidrato , (12.9) metalaxilo, (12.10) metalaxilo-M (mefenoxam), (14.4) fluazinam, (15.9) cimoxanilo, (15.24) fosetil-aluminio, (15.25) fosetil-calcio, (15.26) fosetil-sodio, (15.41) ácido fosforoso y sus sales, (15.42) propamocarb-fosetilato, (15.54) 1-(4-{4-[(5R)-5-(2,6-difluorofenil)-4,5-dihidro-1,2-oxazol-3-il]-1,3-tiazol-2-il}piperidin-1-il)-2-[5-metil-3-(trifluorometil)-1H-pirazol-1-il]etanona, (15.55) 1-(4-{4-[(5S)-5-(2,6-difluorofenil)-4,5-dihidro-1,2-oxazol-3-il]-1,3-tiazol-2-il}piperidin-1-il)-2-[5-metil-3-(trifluorometil)-1H-pirazol-1-il]etanona, (15.56) 1-(4-{4-[5-(2,6-difluorofenil)-4,5-dihidro-1,2-oxazol-

3-il]-1,3-tiazol-2-il}piperidin-1-il)-2-[5-metil-3-(trifluorometil)-1H-pirazol-1-il]etanona, (15.60) 2,6-dimetil-1H,5H-[1,4]dithiino[2,3-c:5,6-c']dipirrol-1,3,5,7(2H,6H)-tetrona, (15.90) {6-[({[(1-metil-1H-tetrazol-5-il)(fenil)metiliden]amino}oxi)metil]piridin-2-il}carbamato de pentilo.

Todos los compañeros de mezcla citados de las clases (1) a (15), si sus grupos funcionales lo permiten, pueden formar opcionalmente sales con bases o ácidos adecuados.

En un modo de realización preferente, la presente invención se refiere a mezclas que comprenden el compuesto (I-1) como el compuesto de fórmula (I) y un componente (B), en particular las mezclas (I-1) + (1,1), (I-1) + (1,2), (I-1) + (1,3), (I-1) + (1,4), (I-1) + (1,5), (I-1) + (1,6), (I-1) + (1,7), (I-1) + (1,8), (I-1) + (1,9), (I-1) + (1,10), (I-1) + (1,11), (I-1) + (1,12), (I-1) + (1,13), (I-1) + (1,14), (I-1) + (1,15), (I-1) + (1,16), (I-1) + (1,17), (I-1) + (1,18), (I-1) + (1,19), (I-1) + (1,20), (I-1) + (1,21), (I-1) + (1,22), (I-1) + (1,23), (I-1) + (1,24), (I-1) + (1,25), (I-1) + (1,26), (I-1) + (1,27), (I-1) + (1,28), (I-1) + (1,29), (I-1) + (1,30), (I-1) + (1,31), (I-1) + (1,32), (I-1) + (1,33), (I-1) + (1,34), (I-1) + (1,35), (I-1) + (1,36), (I-1) + (1,37), (I-1) + (1,38), (I-1) + (1,39), (I-1) + (1,40), (I-1) + (1,41), (I-1) + (1,42), (I-1) + (1,43), (I-1) + (1,44), (I-1) + (1,45), (I-1) + (1,46), (I-1) + (1,47), (I-1) + (1,48), (I-1) + (1,49), (I-1) + (1,50), (I-1) + (1,51), (I-1) + (1,52), (I-1) + (1,53), (I-1) + (1,54), (I-1) + (1,55), (I-1) + (1,56), (I-1) + (1,57), (I-1) + (1,58), (I-1) + (1,59), (I-1) + (1,60), (I-1) + (1,61), (I-1) + (1,62), (I-1) + (1,63), (I-1) + (1,64), (I-1) + (2,1), (I-1) + (2,2), (I-1) + (2,3), (I-1) + (2,4), (I-1) + (2,5), (I-1) + (2,6), (I-1) + (2,7), (I-1) + (2,8), (I-1) + (2,9), (I-1) + (2,10), (I-1) + (2,11), (I-1) + (2,12), (I-1) + (2,13), (I-1) + (2,14), (I-1) + (2,15), (I-1) + (2,16), (I-1) + (2,17), (I-1) + (2,18), (I-1) + (2,19), (I-1) + (2,20), (I-1) + (2,21), (I-1) + (2,22), (I-1) + (2,23), (I-1) + (2,24), (I-1) + (2,25), (I-1) + (2,26), (I-1) + (2,27), (I-1) + (2,28), (I-1) + (2,29), (I-1) + (3,1), (I-1) + (3,2), (I-1) + (3,3), (I-1) + (3,4), (I-1) + (3,5), (I-1) + (3,6), (I-1) + (3,7), (I-1) + (3,8), (I-1) + (3,9), (I-1) + (3,10), (I-1) + (3,11), (I-1) + (3,12), (I-1) + (3,13), (I-1) + (3,14), (I-1) + (3,15), (I-1) + (3,16), (I-1) + (3,17), (I-1) + (3,18), (I-1) + (3,19), (I-1) + (3,20), (I-1) + (3,21), (I-1) + (3,22), (I-1) + (3,23), (I-1) + (3,24),

(l-1) + (3,25), (l-1) + (3,26), (l-1) + (3,27), (l-1) + (3,28), (l-1) + (3,29), (l-1) + (3,30), (l-1) + (3,31), (l-1) + (3,32), (l-1) + (3,33), (l-1) + (4,1), (l-1) + (4,2), (l-1) + (4,3), (l-1) + (4,4), (l-1) + (4,5), (l-1) + (4,6), (l-1) + (4,7), (l-1) + (4,8), (l-1) + (4,9), (l-1) + (4,10), (l-1) + (4,11), (l-1) + (4,12), (l-1) + (4,13), (l-1) + (4,14), (l-1) + (5,1), (l-1) + (5,2), (l-1) + (5,3), (l-1) + (5,4), (l-1) + (5,5), (l-1) + (5,6), (l-1) + (5,7), (l-1) + (5,8), (l-1) + (5,9), (l-1) + (5,10), (l-1) + (5,11), (l-1) + (5,12), (l-1) + (5,13), (l-1) + (5,14), (l-1) + (5,15), (l-1) + (5,16), (l-1) + (5,17), (l-1) + (5,18), (l-1) + (5,19), (l-1) + (5,20), (l-1) + (5,21), (l-1) + (5,22), (l-1) + (5,23), (l-1) + (5,24), (l-1) + (5,25), (l-1) + (5,26), (l-1) + (5,27), (l-1) + (5,28), (l-1) + (5,29), (l-1) + (5,30), (l-1) + (5,31), (l-1) + (5,32), (l-1) + (5,33), (l-1) + (5,34), (l-1) + (6,1), (l-1) + (6,2), (l-1) + (6,3), (l-1) + (6,4), (l-1) + (7,1), (l-1) + (7,2), (l-1) + (7,3), (l-1) + (7,4), (l-1) + (7,5), (l-1) + (7,6), (l-1) + (7,7), (l-1) + (7,8), (l-1) + (8,1), (l-1) + (8,2), (l-1) + (8,3), (l-1) + (8,4), (l-1) + (9,1), (l-1) + (9,2), (l-1) + (9,3), (l-1) + (9,4), (l-1) + (9,5), (l-1) + (9,6), (l-1) + (9,7), (l-1) + (9,8), (l-1) + (9,9), (l-1) + (10,1), (l-1) + (10,2), (l-1) + (10,3), (l-1) + (10,4), (l-1) + (10,5), (l-1) + (10,6), (l-1) + (10,7), (l-1) + (10,8), (l-1) + (10,9), (l-1) + (10,10), (l-1) + (10,11), (l-1) + (10,12), (l-1) + (10,13), (l-1) + (10,14), (l-1) + (10,15), (l-1) + (11,1), (l-1) + (11,2), (l-1) + (11,3), (l-1) + (11,4), (l-1) + (11,5), (l-1) + (11,6), (l-1) + (11,7), (l-1) + (12,1), (l-1) + (12,2), (l-1) + (12,3), (l-1) + (12,4), (l-1) + (12,5), (l-1) + (12,6), (l-1) + (12,7), (l-1) + (12,8), (l-1) + (12,9), (l-1) + (12,10), (l-1) + (12,11), (l-1) + (12,12), (l-1) + (12,13), (l-1) + (13,1), (l-1) + (13,2), (l-1) + (13,3), (l-1) + (13,4), (l-1) + (13,5), (l-1) + (13,6), (l-1) + (13,7), (l-1) + (14,1), (l-1) + (14,2), (l-1) + (14,3), (l-1) + (14,4), (l-1) + (14,5), (l-1) + (15,1), (l-1) + (15,2), (l-1) + (15,3), (l-1) + (15,4), (l-1) + (15,5), (l-1) + (15,6), (l-1) + (15,7), (l-1) + (15,8), (l-1) + (15,9), (l-1) + (15,10), (l-1) + (15,11), (l-1) + (15,12), (l-1) + (15,13), (l-1) + (15,14), (l-1) + (15,15), (l-1) + (15,16), (l-1) + (15,17), (l-1) + (15,18), (l-1) + (15,19), (l-1) + (15,20), (l-1) + (15,21), (l-1) + (15,22), (l-1) + (15,23), (l-1) + (15,24), (l-1) + (15,25), (l-1) + (15,26), (l-1) + (15,27), (l-1) + (15,28), (l-1) + (15,29), (l-1) + (15,30), (l-1) + (15,31), (l-1) + (15,32), (l-1) + (15,33), (l-1) + (15,34), (l-1) + (15,35), (l-1) + (15,36),

(I-1) + (15,37), (I-1) + (15,38), (I-1) + (15,39), (I-1) + (15,41), (I-1) + (15,42), (I-1) + (15,43), (I-1) + (15,44), (I-1) + (15,45), (I-1) + (15,46), (I-1) + (15,47), (I-1) + (15,48), (I-1) + (15,49), (I-1) + (15,50), (I-1) + (15,51), (I-1) + (15,52), (I-1) + (15,53), (I-1) + (15,54), (I-1) + (15,55), (I-1) + (15,56), (I-1) + (15,57), (I-1) + (15,58), (I-1) + (15,59), (I-1) + (15,60), (I-1) + (15,61), (I-1) + (15,62), (I-1) + (15,63), (I-1) + (15,64), (I-1) + (15,65), (I-1) + (15,66), (I-1) + (15,67), (I-1) + (15,68), (I-1) + (15,69), (I-1) + (15,70), (I-1) + (15,71), (I-1) + (15,72), (I-1) + (15,73), (I-1) + (15,74), (I-1) + (15,75), (I-1) + (15,76), (I-1) + (15,77), (I-1) + (15,78), (I-1) + (15,79), (I-1) + (15,80), (I-1) + (15,81), (I-1) + (15,82), (I-1) + (15,83), (I-1) + (15,84), (I-1) + (15,85), (I-1) + (15,86), (I-1) + (15,87), (I-1) + (15,88), (I-1) + (15,89), (I-1) + (15,90), (I-1) + (15,91), (I-1) + (15,92), (I-1) + (15,93), (I-1) + (15,94).

En otro modo de realización particularmente preferente, la presente invención se refiere a mezclas que comprenden el compuesto (I-1) como el compuesto de fórmula (I) y un componente (B), en particular las mezclas (I-1) + (2,1), (I-1) + (2,2), (I-1) + (2,6), (I-1) + (2,8), (I-1) + (2,11), (I-1) + (2,12), (I-1) + (2,13), (I-1) + (2,14), (I-1) + (2,15), (I-1) + (2,16), (I-1) + (2,17), (I-1) + (2,29), (I-1) + (3,1), (I-1) + (3,2), (I-1) + (3,3), (I-1) + (3,4), (I-1) + (3,9), (I-1) + (3,10), (I-1) + (3,12), (I-1) + (3,16), (I-1) + (3,17), (I-1) + (3,22), (I-1) + (4,6), (I-1) + (5,1), (I-1) + (5,4), (I-1) + (5,5), (I-1) + (5,7), (I-1) + (5,8), (I-1) + (5,9), (I-1) + (5,16), (I-1) + (5,23), (I-1) + (5,25), (I-1) + (5,26), (I-1) + (5,29), (I-1) + (5,30), (I-1) + (7,7), (I-1) + (9,2), (I-1) + (9,4), (I-1) + (9,5), (I-1) + (10,9), (I-1) + (10,10), (I-1) + (12,9), (I-1) + (12,10), (I-1) + (14,4), (I-1) + (15,9), (I-1) + (15,24), (I-1) + (15,25), (I-1) + (15,26), (I-1) + (15,41), (I-1) + (15,42), (I-1) + (15,54), (I-1) + (15,55), (I-1) + (15,56), (I-1) + (15,60), (I-1) + (15,90).

En un modo de realización preferente, la presente invención se refiere a mezclas que comprenden el compuesto (I-2) como el compuesto de fórmula (I) y un componente (B), en particular las mezclas (I-2) + (1,1), (I-2) + (1,2), (I-2) + (1,3), (I-2) + (1,4), (I-2) + (1,5), (I-2) + (1,6), (I-2) + (1,7), (I-2) + (1,8), (I-2) + (1,9), (I-

2) + (1,10), (I-2) + (1,11), (I-2) + (1,12), (I-2) + (1,13), (I-2) + (1,14), (I-2) + (1,15), (I-2) + (1,16), (I-2) + (1,17), (I-2) + (1,18), (I-2) + (1,19), (I-2) + (1,20), (I-2) + (1,21), (I-2) + (1,22), (I-2) + (1,23), (I-2) + (1,24), (I-2) + (1,25), (I-2) + (1,26), (I-2) + (1,27), (I-2) + (1,28), (I-2) + (1,29), (I-2) + (1,30), (I-2) + (1,31), (I-2) + (1,32), (I-2) + (1,33), (I-2) + (1,34), (I-2) + (1,35), (I-2) + (1,36), (I-2) + (1,37), (I-2) + (1,38), (I-2) + (1,39), (I-2) + (1,40), (I-2) + (1,41), (I-2) + (1,42), (I-2) + (1,43), (I-2) + (1,44), (I-2) + (1,45), (I-2) + (1,46), (I-2) + (1,47), (I-2) + (1,48), (I-2) + (1,49), (I-2) + (1,50), (I-2) + (1,51), (I-2) + (1,52), (I-2) + (1,53), (I-2) + (1,54), (I-2) + (1,55), (I-2) + (1,56), (I-2) + (1,57), (I-2) + (1,58), (I-2) + (1,59), (I-2) + (1,60), (I-2) + (1,61), (I-2) + (1,62), (I-2) + (1,63), (I-2) + (1,64), (I-2) + (2,1), (I-2) + (2,2), (I-2) + (2,3), (I-2) + (2,4), (I-2) + (2,5), (I-2) + (2,6), (I-2) + (2,7), (I-2) + (2,8), (I-2) + (2,9), (I-2) + (2,10), (I-2) + (2,11), (I-2) + (2,12), (I-2) + (2,13), (I-2) + (2,14), (I-2) + (2,15), (I-2) + (2,16), (I-2) + (2,17), (I-2) + (2,18), (I-2) + (2,19), (I-2) + (2,20), (I-2) + (2,21), (I-2) + (2,22), (I-2) + (2,23), (I-2) + (2,24), (I-2) + (2,25), (I-2) + (2,26), (I-2) + (2,27), (I-2) + (2,28), (I-2) + (2,29), (I-2) + (3,1), (I-2) + (3,2), (I-2) + (3,3), (I-2) + (3,4), (I-2) + (3,5), (I-2) + (3,6), (I-2) + (3,7), (I-2) + (3,8), (I-2) + (3,9), (I-2) + (3,10), (I-2) + (3,11), (I-2) + (3,12), (I-2) + (3,13), (I-2) + (3,14), (I-2) + (3,15), (I-2) + (3,16), (I-2) + (3,17), (I-2) + (3,18), (I-2) + (3,19), (I-2) + (3,20), (I-2) + (3,21), (I-2) + (3,22), (I-2) + (3,23), (I-2) + (3,24), (I-2) + (3,25), (I-2) + (3,26), (I-2) + (3,27), (I-2) + (3,28), (I-2) + (3,29), (I-2) + (3,30), (I-2) + (3,31), (I-2) + (3,32), (I-2) + (3,33), (I-2) + (4,1), (I-2) + (4,2), (I-2) + (4,3), (I-2) + (4,4), (I-2) + (4,5), (I-2) + (4,6), (I-2) + (4,7), (I-2) + (4,8), (I-2) + (4,9), (I-2) + (4,10), (I-2) + (4,11), (I-2) + (4,12), (I-2) + (4,13), (I-2) + (4,14), (I-2) + (5,1), (I-2) + (5,2), (I-2) + (5,3), (I-2) + (5,4), (I-2) + (5,5), (I-2) + (5,6), (I-2) + (5,7), (I-2) + (5,8), (I-2) + (5,9), (I-2) + (5,10), (I-2) + (5,11), (I-2) + (5,12), (I-2) + (5,13), (I-2) + (5,14), (I-2) + (5,15), (I-2) + (5,16), (I-2) + (5,17), (I-2) + (5,18), (I-2) + (5,19), (I-2) + (5,20), (I-2) + (5,21), (I-2) + (5,22), (I-2) + (5,23), (I-2) + (5,24), (I-2) + (5,25), (I-2) + (5,26), (I-2) + (5,27), (I-2) + (5,28), (I-2) + (5,29), (I-2) + (5,30), (I-2) + (5,31), (I-2) + (5,32), (I-2) + (5,33), (I-2) + (5,34), (I-2) + (6,1), (I-2) + (6,2), (I-2) + (6,3), (I-2) + (6,4), (I-2) + (7,1), (I-2) + (7,2), (I-2) + (7,3), (I-2) + (7,4), (I-2) + (7,5), (I-

2) + (7,6), (I-2) + (7,7), (I-2) + (7,8), (I-2) + (8,1), (I-2) + (8,2), (I-2) + (8,3), (I-2) + (8,4), (I-2) + (9,1), (I-2) + (9,2), (I-2) + (9,3), (I-2) + (9,4), (I-2) + (9,5), (I-2) + (9,6), (I-2) + (9,7), (I-2) + (9,8), (I-2) + (9,9), (I-2) + (10,1), (I-2) + (10,2), (I-2) + (10,3), (I-2) + (10,4), (I-2) + (10,5), (I-2) + (10,6), (I-2) + (10,7), (I-2) + (10,8), (I-2) + (10,9), (I-2) + (10,10), (I-2) + (10,11), (I-2) + (10,12), (I-2) + (10,13), (I-2) + (10,14), (I-2) + (10,15), (I-2) + (11,1), (I-2) + (11,2), (I-2) + (11,3), (I-2) + (11,4), (I-2) + (11,5), (I-2) + (11,6), (I-2) + (11,7), (I-2) + (12,1), (I-2) + (12,2), (I-2) + (12,3), (I-2) + (12,4), (I-2) + (12,5), (I-2) + (12,6), (I-2) + (12,7), (I-2) + (12,8), (I-2) + (12,9), (I-2) + (12,10), (I-2) + (12,11), (I-2) + (12,12), (I-2) + (12,13), (I-2) + (13,1), (I-2) + (13,2), (I-2) + (13,3), (I-2) + (13,4), (I-2) + (13,5), (I-2) + (13,6), (I-2) + (13,7), (I-2) + (14,1), (I-2) + (14,2), (I-2) + (14,3), (I-2) + (14,4), (I-2) + (14,5), (I-2) + (15,1), (I-2) + (15,2), (I-2) + (15,3), (I-2) + (15,4), (I-2) + (15,5), (I-2) + (15,6), (I-2) + (15,7), (I-2) + (15,8), (I-2) + (15,9), (I-2) + (15,10), (I-2) + (15,11), (I-2) + (15,12), (I-2) + (15,13), (I-2) + (15,14), (I-2) + (15,15), (I-2) + (15,16), (I-2) + (15,17), (I-2) + (15,18), (I-2) + (15,19), (I-2) + (15,20), (I-2) + (15,21), (I-2) + (15,22), (I-2) + (15,23), (I-2) + (15,24), (I-2) + (15,25), (I-2) + (15,26), (I-2) + (15,27), (I-2) + (15,28), (I-2) + (15,29), (I-2) + (15,30), (I-2) + (15,31), (I-2) + (15,32), (I-2) + (15,33), (I-2) + (15,34), (I-2) + (15,35), (I-2) + (15,36), (I-2) + (15,37), (I-2) + (15,38), (I-2) + (15,39), (I-2) + (15,41), (I-2) + (15,42), (I-2) + (15,43), (I-2) + (15,44), (I-2) + (15,45), (I-2) + (15,46), (I-2) + (15,47), (I-2) + (15,48), (I-2) + (15,49), (I-2) + (15,50), (I-2) + (15,51), (I-2) + (15,52), (I-2) + (15,53), (I-2) + (15,54), (I-2) + (15,55), (I-2) + (15,56), (I-2) + (15,57), (I-2) + (15,58), (I-2) + (15,59), (I-2) + (15,60), (I-2) + (15,61), (I-2) + (15,62), (I-2) + (15,63), (I-2) + (15,64), (I-2) + (15,65), (I-2) + (15,66), (I-2) + (15,67), (I-2) + (15,68), (I-2) + (15,69), (I-2) + (15,70), (I-2) + (15,71), (I-2) + (15,72), (I-2) + (15,73), (I-2) + (15,74), (I-2) + (15,75), (I-2) + (15,76), (I-2) + (15,77), (I-2) + (15,78), (I-2) + (15,79), (I-2) + (15,80), (I-2) + (15,81), (I-2) + (15,82), (I-2) + (15,83), (I-2) + (15,84), (I-2) + (15,85), (I-2) + (15,86), (I-2) + (15,87), (I-2) + (15,88), (I-2) + (15,89), (I-2) + (15,90), (I-2) + (15,91), (I-2) + (15,92), (I-2) + (15,93), (I-

2) + (15,94).

En otro modo de realización particularmente preferente, la presente invención se refiere a mezclas que comprenden el compuesto (I-2) como el compuesto de fórmula (I) y un componente (B), en particular las mezclas (I-2) + (2,1), (I-2) + (2,2), (I-2) + (2,6), (I-2) + (2,8), (I-2) + (2,11), (I-2) + (2,12), (I-2) + (2,13), (I-2) + (2,14), (I-2) + (2,15), (I-2) + (2,16), (I-2) + (2,17), (I-2) + (2,29), (I-2) + (3,1), (I-2) + (3,2), (I-2) + (3,3), (I-2) + (3,4), (I-2) + (3,9), (I-2) + (3,10), (I-2) + (3,12), (I-2) + (3,16), (I-2) + (3,17), (I-2) + (3,22), (I-2) + (4,6), (I-2) + (5,1), (I-2) + (5,4), (I-2) + (5,5), (I-2) + (5,7), (I-2) + (5,8), (I-2) + (5,9), (I-2) + (5,16), (I-2) + (5,23), (I-2) + (5,25), (I-2) + (5,26), (I-2) + (5,29), (I-2) + (5,30), (I-2) + (7,7), (I-2) + (9,2), (I-2) + (9,4), (I-2) + (9,5), (I-2) + (10,9), (I-2) + (10,10), (I-2) + (12,9), (I-2) + (12,10), (I-2) + (14,4), (I-2) + (15,9), (I-2) + (15,24), (I-2) + (15,25), (I-2) + (15,26), (I-2) + (15,41), (I-2) + (15,42), (I-2) + (15,54), (I-2) + (15,55), (I-2) + (15,56), (I-2) + (15,60), (I-2) + (15,90).

En un modo de realización preferente, la presente invención se refiere a mezclas que comprenden el compuesto (I-3) como el compuesto de fórmula (I) y un componente (B), en particular las mezclas (I-3) + (1,1), (I-3) + (1,2), (I-3) + (1,3), (I-3) + (1,4), (I-3) + (1,5), (I-3) + (1,6), (I-3) + (1,7), (I-3) + (1,8), (I-3) + (1,9), (I-3) + (1,10), (I-3) + (1,11), (I-3) + (1,12), (I-3) + (1,13), (I-3) + (1,14), (I-3) + (1,15), (I-3) + (1,16), (I-3) + (1,17), (I-3) + (1,18), (I-3) + (1,19), (I-3) + (1,20), (I-3) + (1,21), (I-3) + (1,22), (I-3) + (1,23), (I-3) + (1,24), (I-3) + (1,25), (I-3) + (1,26), (I-3) + (1,27), (I-3) + (1,28), (I-3) + (1,29), (I-3) + (1,30), (I-3) + (1,31), (I-3) + (1,32), (I-3) + (1,33), (I-3) + (1,34), (I-3) + (1,35), (I-3) + (1,36), (I-3) + (1,37), (I-3) + (1,38), (I-3) + (1,39), (I-3) + (1,40), (I-3) + (1,41), (I-3) + (1,42), (I-3) + (1,43), (I-3) + (1,44), (I-3) + (1,45), (I-3) + (1,46), (I-3) + (1,47), (I-3) + (1,48), (I-3) + (1,49), (I-3) + (1,50), (I-3) + (1,51), (I-3) + (1,52), (I-3) + (1,53), (I-3) + (1,54), (I-3) + (1,55), (I-3) + (1,56), (I-3) + (1,57), (I-3) + (1,58), (I-3) + (1,59), (I-3) + (1,60), (I-3) + (1,61), (I-3) + (1,62), (I-3) + (1,63), (I-3) + (1,64), (I-3) + (2,1), (I-3) + (2,2), (I-3) + (2,3), (I-3) + (2,4), (I-3) + (2,5), (I-3) + (2,6), (I-3) + (2,7), (I-3) + (2,8), (I-3) + (2,9), (I-3) + (2,10), (I-3) + (2,11), (I-

3) + (2,12), (I-3) + (2,13), (I-3) + (2,14), (I-3) + (2,15), (I-3) + (2,16), (I-3) + (2,17), (I-3) + (2,18), (I-3) + (2,19), (I-3) + (2,20), (I-3) + (2,21), (I-3) + (2,22), (I-3) + (2,23), (I-3) + (2,24), (I-3) + (2,25), (I-3) + (2,26), (I-3) + (2,27), (I-3) + (2,28), (I-3) + (2,29), (I-3) + (3,1), (I-3) + (3,2), (I-3) + (3,3), (I-3) + (3,4), (I-3) + (3,5), (I-3) + (3,6), (I-3) + (3,7), (I-3) + (3,8), (I-3) + (3,9), (I-3) + (3,10), (I-3) + (3,11), (I-3) + (3,12), (I-3) + (3,13), (I-3) + (3,14), (I-3) + (3,15), (I-3) + (3,16), (I-3) + (3,17), (I-3) + (3,18), (I-3) + (3,19), (I-3) + (3,20), (I-3) + (3,21), (I-3) + (3,22), (I-3) + (3,23), (I-3) + (3,24), (I-3) + (3,25), (I-3) + (3,26), (I-3) + (3,27), (I-3) + (3,28), (I-3) + (3,29), (I-3) + (3,30), (I-3) + (3,31), (I-3) + (3,32), (I-3) + (3,33), (I-3) + (4,1), (I-3) + (4,2), (I-3) + (4,3), (I-3) + (4,4), (I-3) + (4,5), (I-3) + (4,6), (I-3) + (4,7), (I-3) + (4,8), (I-3) + (4,9), (I-3) + (4,10), (I-3) + (4,11), (I-3) + (4,12), (I-3) + (4,13), (I-3) + (4,14), (I-3) + (5,1), (I-3) + (5,2), (I-3) + (5,3), (I-3) + (5,4), (I-3) + (5,5), (I-3) + (5,6), (I-3) + (5,7), (I-3) + (5,8), (I-3) + (5,9), (I-3) + (5,10), (I-3) + (5,11), (I-3) + (5,12), (I-3) + (5,13), (I-3) + (5,14), (I-3) + (5,15), (I-3) + (5,16), (I-3) + (5,17), (I-3) + (5,18), (I-3) + (5,19), (I-3) + (5,20), (I-3) + (5,21), (I-3) + (5,22), (I-3) + (5,23), (I-3) + (5,24), (I-3) + (5,25), (I-3) + (5,26), (I-3) + (5,27), (I-3) + (5,28), (I-3) + (5,29), (I-3) + (5,30), (I-3) + (5,31), (I-3) + (5,32), (I-3) + (5,33), (I-3) + (5,34), (I-3) + (6,1), (I-3) + (6,2), (I-3) + (6,3), (I-3) + (6,4), (I-3) + (7,1), (I-3) + (7,2), (I-3) + (7,3), (I-3) + (7,4), (I-3) + (7,5), (I-3) + (7,6), (I-3) + (7,7), (I-3) + (7,8), (I-3) + (8,1), (I-3) + (8,2), (I-3) + (8,3), (I-3) + (8,4), (I-3) + (9,1), (I-3) + (9,2), (I-3) + (9,3), (I-3) + (9,4), (I-3) + (9,5), (I-3) + (9,6), (I-3) + (9,7), (I-3) + (9,8), (I-3) + (9,9), (I-3) + (10,1), (I-3) + (10,2), (I-3) + (10,3), (I-3) + (10,4), (I-3) + (10,5), (I-3) + (10,6), (I-3) + (10,7), (I-3) + (10,8), (I-3) + (10,9), (I-3) + (10,10), (I-3) + (10,11), (I-3) + (10,12), (I-3) + (10,13), (I-3) + (10,14), (I-3) + (10,15), (I-3) + (11,1), (I-3) + (11,2), (I-3) + (11,3), (I-3) + (11,4), (I-3) + (11,5), (I-3) + (11,6), (I-3) + (11,7), (I-3) + (12,1), (I-3) + (12,2), (I-3) + (12,3), (I-3) + (12,4), (I-3) + (12,5), (I-3) + (12,6), (I-3) + (12,7), (I-3) + (12,8), (I-3) + (12,9), (I-3) + (12,10), (I-3) + (12,11), (I-3) + (12,12), (I-3) + (12,13), (I-3) + (13,1), (I-3) + (13,2), (I-3) + (13,3), (I-3) + (13,4), (I-3) + (13,5), (I-3) + (13,6), (I-3) + (13,7), (I-3) + (14,1), (I-3) + (14,2), (I-3) + (14,3), (I-3) + (14,4), (I-3) + (14,5), (I-3) + (15,1),

(I-3) + (15,2), (I-3) + (15,3), (I-3) + (15,4), (I-3) + (15,5), (I-3) + (15,6), (I-3) + (15,7), (I-3) + (15,8), (I-3) + (15,9), (I-3) + (15,10), (I-3) + (15,11), (I-3) + (15,12), (I-3) + (15,13), (I-3) + (15,14), (I-3) + (15,15), (I-3) + (15,16), (I-3) + (15,17), (I-3) + (15,18), (I-3) + (15,19), (I-3) + (15,20), (I-3) + (15,21), (I-3) + (15,22), (I-3) + (15,23), (I-3) + (15,24), (I-3) + (15,25), (I-3) + (15,26), (I-3) + (15,27), (I-3) + (15,28), (I-3) + (15,29), (I-3) + (15,30), (I-3) + (15,31), (I-3) + (15,32), (I-3) + (15,33), (I-3) + (15,34), (I-3) + (15,35), (I-3) + (15,36), (I-3) + (15,37), (I-3) + (15,38), (I-3) + (15,39), (I-3) + (15,41), (I-3) + (15,42), (I-3) + (15,43), (I-3) + (15,44), (I-3) + (15,45), (I-3) + (15,46), (I-3) + (15,47), (I-3) + (15,48), (I-3) + (15,49), (I-3) + (15,50), (I-3) + (15,51), (I-3) + (15,52), (I-3) + (15,53), (I-3) + (15,54), (I-3) + (15,55), (I-3) + (15,56), (I-3) + (15,57), (I-3) + (15,58), (I-3) + (15,59), (I-3) + (15,60), (I-3) + (15,61), (I-3) + (15,62), (I-3) + (15,63), (I-3) + (15,64), (I-3) + (15,65), (I-3) + (15,66), (I-3) + (15,67), (I-3) + (15,68), (I-3) + (15,69), (I-3) + (15,70), (I-3) + (15,71), (I-3) + (15,72), (I-3) + (15,73), (I-3) + (15,74), (I-3) + (15,75), (I-3) + (15,76), (I-3) + (15,77), (I-3) + (15,78), (I-3) + (15,79), (I-3) + (15,80), (I-3) + (15,81), (I-3) + (15,82), (I-3) + (15,83), (I-3) + (15,84), (I-3) + (15,85), (I-3) + (15,86), (I-3) + (15,87), (I-3) + (15,88), (I-3) + (15,89), (I-3) + (15,90), (I-3) + (15,91), (I-3) + (15,92), (I-3) + (15,93), (I-3) + (15,94).

En otro modo de realización particularmente preferente, la presente invención se refiere a mezclas que comprenden el compuesto (I-3) como el compuesto de fórmula (I) y un componente (B), en particular las mezclas (I-3) + (2,1), (I-3) + (2,2), (I-3) + (2,6), (I-3) + (2,8), (I-3) + (2,11), (I-3) + (2,12), (I-3) + (2,13), (I-3) + (2,14), (I-3) + (2,15), (I-3) + (2,16), (I-3) + (2,17), (I-3) + (2,29), (I-3) + (3,1), (I-3) + (3,2), (I-3) + (3,3), (I-3) + (3,4), (I-3) + (3,9), (I-3) + (3,10), (I-3) + (3,12), (I-3) + (3,16), (I-3) + (3,17), (I-3) + (3,22), (I-3) + (4,6), (I-3) + (5,1), (I-3) + (5,4), (I-3) + (5,5), (I-3) + (5,7), (I-3) + (5,8), (I-3) + (5,9), (I-3) + (5,16), (I-3) + (5,23), (I-3) + (5,25), (I-3) + (5,26), (I-3) + (5,29), (I-3) + (5,30), (I-3) + (7,7), (I-3) + (9,2), (I-3) + (9,4), (I-3) + (9,5), (I-3) + (10,9), (I-3) + (10,10), (I-3) + (12,9), (I-3) + (12,10),

(I-3) + (14,4), (I-3) + (15,9), (I-3) + (15,24), (I-3) + (15,25), (I-3) + (15,26), (I-3) + (15,41), (I-3) + (15,42), (I-3) + (15,54), (I-3) + (15,55), (I-3) + (15,56), (I-3) + (15,60), (I-3) + (15,90).

En un modo de realización preferente, la presente invención se refiere a mezclas que comprenden el compuesto (I-4) como el compuesto de fórmula (I) y un componente (B), en particular las mezclas (I-4) + (1,1), (I-4) + (1,2), (I-4) + (1,3), (I-4) + (1,4), (I-4) + (1,5), (I-4) + (1,6), (I-4) + (1,7), (I-4) + (1,8), (I-4) + (1,9), (I-4) + (1,10), (I-4) + (1,11), (I-4) + (1,12), (I-4) + (1,13), (I-4) + (1,14), (I-4) + (1,15), (I-4) + (1,16), (I-4) + (1,17), (I-4) + (1,18), (I-4) + (1,19), (I-4) + (1,20), (I-4) + (1,21), (I-4) + (1,22), (I-4) + (1,23), (I-4) + (1,24), (I-4) + (1,25), (I-4) + (1,26), (I-4) + (1,27), (I-4) + (1,28), (I-4) + (1,29), (I-4) + (1,30), (I-4) + (1,31), (I-4) + (1,32), (I-4) + (1,33), (I-4) + (1,34), (I-4) + (1,35), (I-4) + (1,36), (I-4) + (1,37), (I-4) + (1,38), (I-4) + (1,39), (I-4) + (1,40), (I-4) + (1,41), (I-4) + (1,42), (I-4) + (1,43), (I-4) + (1,44), (I-4) + (1,45), (I-4) + (1,46), (I-4) + (1,47), (I-4) + (1,48), (I-4) + (1,49), (I-4) + (1,50), (I-4) + (1,51), (I-4) + (1,52), (I-4) + (1,53), (I-4) + (1,54), (I-4) + (1,55), (I-4) + (1,56), (I-4) + (1,57), (I-4) + (1,58), (I-4) + (1,59), (I-4) + (1,60), (I-4) + (1,61), (I-4) + (1,62), (I-4) + (1,63), (I-4) + (1,64), (I-4) + (2,1), (I-4) + (2,2), (I-4) + (2,3), (I-4) + (2,4), (I-4) + (2,5), (I-4) + (2,6), (I-4) + (2,7), (I-4) + (2,8), (I-4) + (2,9), (I-4) + (2,10), (I-4) + (2,11), (I-4) + (2,12), (I-4) + (2,13), (I-4) + (2,14), (I-4) + (2,15), (I-4) + (2,16), (I-4) + (2,17), (I-4) + (2,18), (I-4) + (2,19), (I-4) + (2,20), (I-4) + (2,21), (I-4) + (2,22), (I-4) + (2,23), (I-4) + (2,24), (I-4) + (2,25), (I-4) + (2,26), (I-4) + (2,27), (I-4) + (2,28), (I-4) + (2,29), (I-4) + (3,1), (I-4) + (3,2), (I-4) + (3,3), (I-4) + (3,4), (I-4) + (3,5), (I-4) + (3,6), (I-4) + (3,7), (I-4) + (3,8), (I-4) + (3,9), (I-4) + (3,10), (I-4) + (3,11), (I-4) + (3,12), (I-4) + (3,13), (I-4) + (3,14), (I-4) + (3,15), (I-4) + (3,16), (I-4) + (3,17), (I-4) + (3,18), (I-4) + (3,19), (I-4) + (3,20), (I-4) + (3,21), (I-4) + (3,22), (I-4) + (3,23), (I-4) + (3,24), (I-4) + (3,25), (I-4) + (3,26), (I-4) + (3,27), (I-4) + (3,28), (I-4) + (3,29), (I-4) + (3,30), (I-4) + (3,31), (I-4) + (3,32), (I-4) + (3,33), (I-4) + (4,1), (I-4) + (4,2), (I-4) + (4,3), (I-4) + (4,4), (I-4) + (4,5), (I-4) + (4,6), (I-4) + (4,7), (I-4) + (4,8), (I-4) + (4,9), (I-4) + (4,10), (I-4) + (4,11), (I-4) + (4,12), (I-4) + (4,13), (I-4) + (4,14), (I-4) + (5,1), (I-

4) + (5,2), (I-4) + (5,3), (I-4) + (5,4), (I-4) + (5,5), (I-4) + (5,6), (I-4) + (5,7), (I-4) + (5,8), (I-4) + (5,9), (I-4) + (5,10), (I-4) + (5,11), (I-4) + (5,12), (I-4) + (5,13), (I-4) + (5,14), (I-4) + (5,15), (I-4) + (5,16), (I-4) + (5,17), (I-4) + (5,18), (I-4) + (5,19), (I-4) + (5,20), (I-4) + (5,21), (I-4) + (5,22), (I-4) + (5,23), (I-4) + (5,24), (I-4) + (5,25), (I-4) + (5,26), (I-4) + (5,27), (I-4) + (5,28), (I-4) + (5,29), (I-4) + (5,30), (I-4) + (5,31), (I-4) + (5,32), (I-4) + (5,33), (I-4) + (5,34), (I-4) + (6,1), (I-4) + (6,2), (I-4) + (6,3), (I-4) + (6,4), (I-4) + (7,1), (I-4) + (7,2), (I-4) + (7,3), (I-4) + (7,4), (I-4) + (7,5), (I-4) + (7,6), (I-4) + (7,7), (I-4) + (7,8), (I-4) + (8,1), (I-4) + (8,2), (I-4) + (8,3), (I-4) + (8,4), (I-4) + (9,1), (I-4) + (9,2), (I-4) + (9,3), (I-4) + (9,4), (I-4) + (9,5), (I-4) + (9,6), (I-4) + (9,7), (I-4) + (9,8), (I-4) + (9,9), (I-4) + (10,1), (I-4) + (10,2), (I-4) + (10,3), (I-4) + (10,4), (I-4) + (10,5), (I-4) + (10,6), (I-4) + (10,7), (I-4) + (10,8), (I-4) + (10,9), (I-4) + (10,10), (I-4) + (10,11), (I-4) + (10,12), (I-4) + (10,13), (I-4) + (10,14), (I-4) + (10,15), (I-4) + (11,1), (I-4) + (11,2), (I-4) + (11,3), (I-4) + (11,4), (I-4) + (11,5), (I-4) + (11,6), (I-4) + (11,7), (I-4) + (12,1), (I-4) + (12,2), (I-4) + (12,3), (I-4) + (12,4), (I-4) + (12,5), (I-4) + (12,6), (I-4) + (12,7), (I-4) + (12,8), (I-4) + (12,9), (I-4) + (12,10), (I-4) + (12,11), (I-4) + (12,12), (I-4) + (12,13), (I-4) + (13,1), (I-4) + (13,2), (I-4) + (13,3), (I-4) + (13,4), (I-4) + (13,5), (I-4) + (13,6), (I-4) + (13,7), (I-4) + (14,1), (I-4) + (14,2), (I-4) + (14,3), (I-4) + (14,4), (I-4) + (14,5), (I-4) + (15,1), (I-4) + (15,2), (I-4) + (15,3), (I-4) + (15,4), (I-4) + (15,5), (I-4) + (15,6), (I-4) + (15,7), (I-4) + (15,8), (I-4) + (15,9), (I-4) + (15,10), (I-4) + (15,11), (I-4) + (15,12), (I-4) + (15,13), (I-4) + (15,14), (I-4) + (15,15), (I-4) + (15,16), (I-4) + (15,17), (I-4) + (15,18), (I-4) + (15,19), (I-4) + (15,20), (I-4) + (15,21), (I-4) + (15,22), (I-4) + (15,23), (I-4) + (15,24), (I-4) + (15,25), (I-4) + (15,26), (I-4) + (15,27), (I-4) + (15,28), (I-4) + (15,29), (I-4) + (15,30), (I-4) + (15,31), (I-4) + (15,32), (I-4) + (15,33), (I-4) + (15,34), (I-4) + (15,35), (I-4) + (15,36), (I-4) + (15,37), (I-4) + (15,38), (I-4) + (15,39), (I-4) + (15,41), (I-4) + (15,42), (I-4) + (15,43), (I-4) + (15,44), (I-4) + (15,45), (I-4) + (15,46), (I-4) + (15,47), (I-4) + (15,48), (I-4) + (15,49), (I-4) + (15,50), (I-4) + (15,51), (I-4) + (15,52), (I-4) + (15,53), (I-4) + (15,54), (I-4) + (15,55), (I-4) + (15,56), (I-4) + (15,57), (I-4) + (15,58), (I-

4) + (15,59), (I-4) + (15,60), (I-4) + (15,61), (I-4) + (15,62), (I-4) + (15,63), (I-4) + (15,64), (I-4) + (15,65), (I-4) + (15,66), (I-4) + (15,67), (I-4) + (15,68), (I-4) + (15,69), (I-4) + (15,70), (I-4) + (15,71), (I-4) + (15,72), (I-4) + (15,73), (I-4) + (15,74), (I-4) + (15,75), (I-4) + (15,76), (I-4) + (15,77), (I-4) + (15,78), (I-4) + (15,79), (I-4) + (15,80), (I-4) + (15,81), (I-4) + (15,82), (I-4) + (15,83), (I-4) + (15,84), (I-4) + (15,85), (I-4) + (15,86), (I-4) + (15,87), (I-4) + (15,88), (I-4) + (15,89), (I-4) + (15,90), (I-4) + (15,91), (I-4) + (15,92), (I-4) + (15,93), (I-4) + (15,94).

En otro modo de realización particularmente preferente, la presente invención se refiere a mezclas que comprenden el compuesto (I-4) como el compuesto de fórmula (I) y un componente (B), en particular las mezclas (I-4) + (2,1), (I-4) + (2,2), (I-4) + (2,6), (I-4) + (2,8), (I-4) + (2,11), (I-4) + (2,12), (I-4) + (2,13), (I-4) + (2,14), (I-4) + (2,15), (I-4) + (2,16), (I-4) + (2,17), (I-4) + (2,29), (I-4) + (3,1), (I-4) + (3,2), (I-4) + (3,3), (I-4) + (3,4), (I-4) + (3,9), (I-4) + (3,10), (I-4) + (3,12), (I-4) + (3,16), (I-4) + (3,17), (I-4) + (3,22), (I-4) + (4,6), (I-4) + (5,1), (I-4) + (5,4), (I-4) + (5,5), (I-4) + (5,7), (I-4) + (5,8), (I-4) + (5,9), (I-4) + (5,16), (I-4) + (5,23), (I-4) + (5,25), (I-4) + (5,26), (I-4) + (5,29), (I-4) + (5,30), (I-4) + (7,7), (I-4) + (9,2), (I-4) + (9,4), (I-4) + (9,5), (I-4) + (10,9), (I-4) + (10,10), (I-4) + (12,9), (I-4) + (12,10), (I-4) + (14,4), (I-4) + (15,9), (I-4) + (15,24), (I-4) + (15,25), (I-4) + (15,26), (I-4) + (15,41), (I-4) + (15,42), (I-4) + (15,54), (I-4) + (15,55), (I-4) + (15,56), (I-4) + (15,60), (I-4) + (15,90).

En un modo de realización preferente, la presente invención se refiere a mezclas que comprenden el compuesto (I-5) como el compuesto de fórmula (I) y un componente (B), en particular las mezclas (I-5) + (1,1), (I-5) + (1,2), (I-5) + (1,3), (I-5) + (1,4), (I-5) + (1,5), (I-5) + (1,6), (I-5) + (1,7), (I-5) + (1,8), (I-5) + (1,9), (I-5) + (1,10), (I-5) + (1,11), (I-5) + (1,12), (I-5) + (1,13), (I-5) + (1,14), (I-5) + (1,15), (I-5) + (1,16), (I-5) + (1,17), (I-5) + (1,18), (I-5) + (1,19), (I-5) + (1,20), (I-5) + (1,21), (I-5) + (1,22), (I-5) + (1,23), (I-5) + (1,24), (I-5) + (1,25), (I-5) + (1,26), (I-5) + (1,27), (I-5) + (1,28), (I-5) + (1,29), (I-5) + (1,30), (I-5) + (1,31), (I-5) + (1,32), (I-5) + (1,33),

(I-5) + (1,34), (I-5) + (1,35), (I-5) + (1,36), (I-5) + (1,37), (I-5) + (1,38), (I-5) + (1,39), (I-5) + (1,40), (I-5) + (1,41), (I-5) + (1,42), (I-5) + (1,43), (I-5) + (1,44), (I-5) + (1,45), (I-5) + (1,46), (I-5) + (1,47), (I-5) + (1,48), (I-5) + (1,49), (I-5) + (1,50), (I-5) + (1,51), (I-5) + (1,52), (I-5) + (1,53), (I-5) + (1,54), (I-5) + (1,55), (I-5) + (1,56), (I-5) + (1,57), (I-5) + (1,58), (I-5) + (1,59), (I-5) + (1,60), (I-5) + (1,61), (I-5) + (1,62), (I-5) + (1,63), (I-5) + (1,64), (I-5) + (2,1), (I-5) + (2,2), (I-5) + (2,3), (I-5) + (2,4), (I-5) + (2,5), (I-5) + (2,6), (I-5) + (2,7), (I-5) + (2,8), (I-5) + (2,9), (I-5) + (2,10), (I-5) + (2,11), (I-5) + (2,12), (I-5) + (2,13), (I-5) + (2,14), (I-5) + (2,15), (I-5) + (2,16), (I-5) + (2,17), (I-5) + (2,18), (I-5) + (2,19), (I-5) + (2,20), (I-5) + (2,21), (I-5) + (2,22), (I-5) + (2,23), (I-5) + (2,24), (I-5) + (2,25), (I-5) + (2,26), (I-5) + (2,27), (I-5) + (2,28), (I-5) + (2,29), (I-5) + (3,1), (I-5) + (3,2), (I-5) + (3,3), (I-5) + (3,4), (I-5) + (3,5), (I-5) + (3,6), (I-5) + (3,7), (I-5) + (3,8), (I-5) + (3,9), (I-5) + (3,10), (I-5) + (3,11), (I-5) + (3,12), (I-5) + (3,13), (I-5) + (3,14), (I-5) + (3,15), (I-5) + (3,16), (I-5) + (3,17), (I-5) + (3,18), (I-5) + (3,19), (I-5) + (3,20), (I-5) + (3,21), (I-5) + (3,22), (I-5) + (3,23), (I-5) + (3,24), (I-5) + (3,25), (I-5) + (3,26), (I-5) + (3,27), (I-5) + (3,28), (I-5) + (3,29), (I-5) + (3,30), (I-5) + (3,31), (I-5) + (3,32), (I-5) + (3,33), (I-5) + (4,1), (I-5) + (4,2), (I-5) + (4,3), (I-5) + (4,4), (I-5) + (4,5), (I-5) + (4,6), (I-5) + (4,7), (I-5) + (4,8), (I-5) + (4,9), (I-5) + (4,10), (I-5) + (4,11), (I-5) + (4,12), (I-5) + (4,13), (I-5) + (4,14), (I-5) + (5,1), (I-5) + (5,2), (I-5) + (5,3), (I-5) + (5,4), (I-5) + (5,5), (I-5) + (5,6), (I-5) + (5,7), (I-5) + (5,8), (I-5) + (5,9), (I-5) + (5,10), (I-5) + (5,11), (I-5) + (5,12), (I-5) + (5,13), (I-5) + (5,14), (I-5) + (5,15), (I-5) + (5,16), (I-5) + (5,17), (I-5) + (5,18), (I-5) + (5,19), (I-5) + (5,20), (I-5) + (5,21), (I-5) + (5,22), (I-5) + (5,23), (I-5) + (5,24), (I-5) + (5,25), (I-5) + (5,26), (I-5) + (5,27), (I-5) + (5,28), (I-5) + (5,29), (I-5) + (5,30), (I-5) + (5,31), (I-5) + (5,32), (I-5) + (5,33), (I-5) + (5,34), (I-5) + (6,1), (I-5) + (6,2), (I-5) + (6,3), (I-5) + (6,4), (I-5) + (7,1), (I-5) + (7,2), (I-5) + (7,3), (I-5) + (7,4), (I-5) + (7,5), (I-5) + (7,6), (I-5) + (7,7), (I-5) + (7,8), (I-5) + (8,1), (I-5) + (8,2), (I-5) + (8,3), (I-5) + (8,4), (I-5) + (9,1), (I-5) + (9,2), (I-5) + (9,3), (I-5) + (9,4), (I-5) + (9,5), (I-5) + (9,6), (I-5) + (9,7), (I-5) + (9,8), (I-5) + (9,9), (I-5) + (10,1), (I-5) + (10,2), (I-5) + (10,3), (I-5) + (10,4), (I-5) + (10,5), (I-5) + (10,6), (I-5) + (10,7), (I-5) + (10,8),

(I-5) + (10,9), (I-5) + (10,10), (I-5) + (10,11), (I-5) + (10,12), (I-5) + (10,13), (I-5) + (10,14), (I-5) + (10,15), (I-5) + (11,1), (I-5) + (11,2), (I-5) + (11,3), (I-5) + (11,4), (I-5) + (11,5), (I-5) + (11,6), (I-5) + (11,7), (I-5) + (12,1), (I-5) + (12,2), (I-5) + (12,3), (I-5) + (12,4), (I-5) + (12,5), (I-5) + (12,6), (I-5) + (12,7), (I-5) + (12,8), (I-5) + (12,9), (I-5) + (12,10), (I-5) + (12,11), (I-5) + (12,12), (I-5) + (12,13), (I-5) + (13,1), (I-5) + (13,2), (I-5) + (13,3), (I-5) + (13,4), (I-5) + (13,5), (I-5) + (13,6), (I-5) + (13,7), (I-5) + (14,1), (I-5) + (14,2), (I-5) + (14,3), (I-5) + (14,4), (I-5) + (14,5), (I-5) + (15,1), (I-5) + (15,2), (I-5) + (15,3), (I-5) + (15,4), (I-5) + (15,5), (I-5) + (15,6), (I-5) + (15,7), (I-5) + (15,8), (I-5) + (15,9), (I-5) + (15,10), (I-5) + (15,11), (I-5) + (15,12), (I-5) + (15,13), (I-5) + (15,14), (I-5) + (15,15), (I-5) + (15,16), (I-5) + (15,17), (I-5) + (15,18), (I-5) + (15,19), (I-5) + (15,20), (I-5) + (15,21), (I-5) + (15,22), (I-5) + (15,23), (I-5) + (15,24), (I-5) + (15,25), (I-5) + (15,26), (I-5) + (15,27), (I-5) + (15,28), (I-5) + (15,29), (I-5) + (15,30), (I-5) + (15,31), (I-5) + (15,32), (I-5) + (15,33), (I-5) + (15,34), (I-5) + (15,35), (I-5) + (15,36), (I-5) + (15,37), (I-5) + (15,38), (I-5) + (15,39), (I-5) + (15,41), (I-5) + (15,42), (I-5) + (15,43), (I-5) + (15,44), (I-5) + (15,45), (I-5) + (15,46), (I-5) + (15,47), (I-5) + (15,48), (I-5) + (15,49), (I-5) + (15,50), (I-5) + (15,51), (I-5) + (15,52), (I-5) + (15,53), (I-5) + (15,54), (I-5) + (15,55), (I-5) + (15,56), (I-5) + (15,57), (I-5) + (15,58), (I-5) + (15,59), (I-5) + (15,60), (I-5) + (15,61), (I-5) + (15,62), (I-5) + (15,63), (I-5) + (15,64), (I-5) + (15,65), (I-5) + (15,66), (I-5) + (15,67), (I-5) + (15,68), (I-5) + (15,69), (I-5) + (15,70), (I-5) + (15,71), (I-5) + (15,72), (I-5) + (15,73), (I-5) + (15,74), (I-5) + (15,75), (I-5) + (15,76), (I-5) + (15,77), (I-5) + (15,78), (I-5) + (15,79), (I-5) + (15,80), (I-5) + (15,81), (I-5) + (15,82), (I-5) + (15,83), (I-5) + (15,84), (I-5) + (15,85), (I-5) + (15,86), (I-5) + (15,87), (I-5) + (15,88), (I-5) + (15,89), (I-5) + (15,90), (I-5) + (15,91), (I-5) + (15,92), (I-5) + (15,93), (I-5) + (15,94).

En otro modo de realización particularmente preferente, la presente invención se refiere a mezclas que comprenden el compuesto (I-5) como el compuesto de fórmula (I) y un componente (B), en particular las mezclas (I-5) + (2,1), (I-

5) + (2,2), (I-5) + (2,6), (I-5) + (2,8), (I-5) + (2,11), (I-5) + (2,12), (I-5) + (2,13), (I-5) + (2,14), (I-5) + (2,15), (I-5) + (2,16), (I-5) + (2,17), (I-5) + (2,29), (I-5) + (3,1), (I-5) + (3,2), (I-5) + (3,3), (I-5) + (3,4), (I-5) + (3,9), (I-5) + (3,10), (I-5) + (3,12), (I-5) + (3,16), (I-5) + (3,17), (I-5) + (3,22), (I-5) + (4,6), (I-5) + (5,1), (I-5) + (5,4), (I-5) + (5,5), (I-5) + (5,7), (I-5) + (5,8), (I-5) + (5,9), (I-5) + (5,16), (I-5) + (5,23), (I-5) + (5,25), (I-5) + (5,26), (I-5) + (5,29), (I-5) + (5,30), (I-5) + (7,7), (I-5) + (9,2), (I-5) + (9,4), (I-5) + (9,5), (I-5) + (10,9), (I-5) + (10,10), (I-5) + (12,9), (I-5) + (12,10), (I-5) + (14,4), (I-5) + (15,9), (I-5) + (15,24), (I-5) + (15,25), (I-5) + (15,26), (I-5) + (15,41), (I-5) + (15,42), (I-5) + (15,54), (I-5) + (15,55), (I-5) + (15,56), (I-5) + (15,60), (I-5) + (15,90).

En un modo de realización preferente, la presente invención se refiere a mezclas que comprenden el compuesto (I-6) como el compuesto de fórmula (I) y un componente (B), en particular las mezclas (I-6) + (1,1), (I-6) + (1,2), (I-6) + (1,3), (I-6) + (1,4), (I-6) + (1,5), (I-6) + (1,6), (I-6) + (1,7), (I-6) + (1,8), (I-6) + (1,9), (I-6) + (1,10), (I-6) + (1,11), (I-6) + (1,12), (I-6) + (1,13), (I-6) + (1,14), (I-6) + (1,15), (I-6) + (1,16), (I-6) + (1,17), (I-6) + (1,18), (I-6) + (1,19), (I-6) + (1,20), (I-6) + (1,21), (I-6) + (1,22), (I-6) + (1,23), (I-6) + (1,24), (I-6) + (1,25), (I-6) + (1,26), (I-6) + (1,27), (I-6) + (1,28), (I-6) + (1,29), (I-6) + (1,30), (I-6) + (1,31), (I-6) + (1,32), (I-6) + (1,33), (I-6) + (1,34), (I-6) + (1,35), (I-6) + (1,36), (I-6) + (1,37), (I-6) + (1,38), (I-6) + (1,39), (I-6) + (1,40), (I-6) + (1,41), (I-6) + (1,42), (I-6) + (1,43), (I-6) + (1,44), (I-6) + (1,45), (I-6) + (1,46), (I-6) + (1,47), (I-6) + (1,48), (I-6) + (1,49), (I-6) + (1,50), (I-6) + (1,51), (I-6) + (1,52), (I-6) + (1,53), (I-6) + (1,54), (I-6) + (1,55), (I-6) + (1,56), (I-6) + (1,57), (I-6) + (1,58), (I-6) + (1,59), (I-6) + (1,60), (I-6) + (1,61), (I-6) + (1,62), (I-6) + (1,63), (I-6) + (1,64), (I-6) + (2,1), (I-6) + (2,2), (I-6) + (2,3), (I-6) + (2,4), (I-6) + (2,5), (I-6) + (2,6), (I-6) + (2,7), (I-6) + (2,8), (I-6) + (2,9), (I-6) + (2,10), (I-6) + (2,11), (I-6) + (2,12), (I-6) + (2,13), (I-6) + (2,14), (I-6) + (2,15), (I-6) + (2,16), (I-6) + (2,17), (I-6) + (2,18), (I-6) + (2,19), (I-6) + (2,20), (I-6) + (2,21), (I-6) + (2,22), (I-6) + (2,23), (I-6) + (2,24), (I-6) + (2,25), (I-6) + (2,26), (I-6) + (2,27), (I-6) + (2,28), (I-6) + (2,29), (I-6) + (3,1), (I-6) + (3,2), (I-6) + (3,3), (I-6) + (3,4), (I-6) + (3,5), (I-6) + (3,6), (I-

6) + (3,7), (I-6) + (3,8), (I-6) + (3,9), (I-6) + (3,10), (I-6) + (3,11), (I-6) + (3,12), (I-6) + (3,13), (I-6) + (3,14), (I-6) + (3,15), (I-6) + (3,16), (I-6) + (3,17), (I-6) + (3,18), (I-6) + (3,19), (I-6) + (3,20), (I-6) + (3,21), (I-6) + (3,22), (I-6) + (3,23), (I-6) + (3,24), (I-6) + (3,25), (I-6) + (3,26), (I-6) + (3,27), (I-6) + (3,28), (I-6) + (3,29), (I-6) + (3,30), (I-6) + (3,31), (I-6) + (3,32), (I-6) + (3,33), (I-6) + (4,1), (I-6) + (4,2), (I-6) + (4,3), (I-6) + (4,4), (I-6) + (4,5), (I-6) + (4,6), (I-6) + (4,7), (I-6) + (4,8), (I-6) + (4,9), (I-6) + (4,10), (I-6) + (4,11), (I-6) + (4,12), (I-6) + (4,13), (I-6) + (4,14), (I-6) + (5,1), (I-6) + (5,2), (I-6) + (5,3), (I-6) + (5,4), (I-6) + (5,5), (I-6) + (5,6), (I-6) + (5,7), (I-6) + (5,8), (I-6) + (5,9), (I-6) + (5,10), (I-6) + (5,11), (I-6) + (5,12), (I-6) + (5,13), (I-6) + (5,14), (I-6) + (5,15), (I-6) + (5,16), (I-6) + (5,17), (I-6) + (5,18), (I-6) + (5,19), (I-6) + (5,20), (I-6) + (5,21), (I-6) + (5,22), (I-6) + (5,23), (I-6) + (5,24), (I-6) + (5,25), (I-6) + (5,26), (I-6) + (5,27), (I-6) + (5,28), (I-6) + (5,29), (I-6) + (5,30), (I-6) + (5,31), (I-6) + (5,32), (I-6) + (5,33), (I-6) + (5,34), (I-6) + (6,1), (I-6) + (6,2), (I-6) + (6,3), (I-6) + (6,4), (I-6) + (7,1), (I-6) + (7,2), (I-6) + (7,3), (I-6) + (7,4), (I-6) + (7,5), (I-6) + (7,6), (I-6) + (7,7), (I-6) + (7,8), (I-6) + (8,1), (I-6) + (8,2), (I-6) + (8,3), (I-6) + (8,4), (I-6) + (9,1), (I-6) + (9,2), (I-6) + (9,3), (I-6) + (9,4), (I-6) + (9,5), (I-6) + (9,6), (I-6) + (9,7), (I-6) + (9,8), (I-6) + (9,9), (I-6) + (10,1), (I-6) + (10,2), (I-6) + (10,3), (I-6) + (10,4), (I-6) + (10,5), (I-6) + (10,6), (I-6) + (10,7), (I-6) + (10,8), (I-6) + (10,9), (I-6) + (10,10), (I-6) + (10,11), (I-6) + (10,12), (I-6) + (10,13), (I-6) + (10,14), (I-6) + (10,15), (I-6) + (11,1), (I-6) + (11,2), (I-6) + (11,3), (I-6) + (11,4), (I-6) + (11,5), (I-6) + (11,6), (I-6) + (11,7), (I-6) + (12,1), (I-6) + (12,2), (I-6) + (12,3), (I-6) + (12,4), (I-6) + (12,5), (I-6) + (12,6), (I-6) + (12,7), (I-6) + (12,8), (I-6) + (12,9), (I-6) + (12,10), (I-6) + (12,11), (I-6) + (12,12), (I-6) + (12,13), (I-6) + (13,1), (I-6) + (13,2), (I-6) + (13,3), (I-6) + (13,4), (I-6) + (13,5), (I-6) + (13,6), (I-6) + (13,7), (I-6) + (14,1), (I-6) + (14,2), (I-6) + (14,3), (I-6) + (14,4), (I-6) + (14,5), (I-6) + (15,1), (I-6) + (15,2), (I-6) + (15,3), (I-6) + (15,4), (I-6) + (15,5), (I-6) + (15,6), (I-6) + (15,7), (I-6) + (15,8), (I-6) + (15,9), (I-6) + (15,10), (I-6) + (15,11), (I-6) + (15,12), (I-6) + (15,13), (I-6) + (15,14), (I-6) + (15,15), (I-6) + (15,16), (I-6) + (15,17), (I-6) + (15,18), (I-6) + (15,19), (I-6) + (15,20), (I-6) + (15,21), (I-6) + (15,22), (I-

6) + (15,23), (I-6) + (15,24), (I-6) + (15,25), (I-6) + (15,26), (I-6) + (15,27), (I-6) + (15,28), (I-6) + (15,29), (I-6) + (15,30), (I-6) + (15,31), (I-6) + (15,32), (I-6) + (15,33), (I-6) + (15,34), (I-6) + (15,35), (I-6) + (15,36), (I-6) + (15,37), (I-6) + (15,38), (I-6) + (15,39), (I-6) + (15,41), (I-6) + (15,42), (I-6) + (15,43), (I-6) + (15,44), (I-6) + (15,45), (I-6) + (15,46), (I-6) + (15,47), (I-6) + (15,48), (I-6) + (15,49), (I-6) + (15,50), (I-6) + (15,51), (I-6) + (15,52), (I-6) + (15,53), (I-6) + (15,54), (I-6) + (15,55), (I-6) + (15,56), (I-6) + (15,57), (I-6) + (15,58), (I-6) + (15,59), (I-6) + (15,60), (I-6) + (15,61), (I-6) + (15,62), (I-6) + (15,63), (I-6) + (15,64), (I-6) + (15,65), (I-6) + (15,66), (I-6) + (15,67), (I-6) + (15,68), (I-6) + (15,69), (I-6) + (15,70), (I-6) + (15,71), (I-6) + (15,72), (I-6) + (15,73), (I-6) + (15,74), (I-6) + (15,75), (I-6) + (15,76), (I-6) + (15,77), (I-6) + (15,78), (I-6) + (15,79), (I-6) + (15,80), (I-6) + (15,81), (I-6) + (15,82), (I-6) + (15,83), (I-6) + (15,84), (I-6) + (15,85), (I-6) + (15,86), (I-6) + (15,87), (I-6) + (15,88), (I-6) + (15,89), (I-6) + (15,90), (I-6) + (15,91), (I-6) + (15,92), (I-6) + (15,93), (I-6) + (15,94).

En otro modo de realización particularmente preferente, la presente invención se refiere a mezclas que comprenden el compuesto (I-6) como el compuesto de fórmula (I) y un componente (B), en particular las mezclas (I-6) + (2,1), (I-6) + (2,2), (I-6) + (2,6), (I-6) + (2,8), (I-6) + (2,11), (I-6) + (2,12), (I-6) + (2,13), (I-6) + (2,14), (I-6) + (2,15), (I-6) + (2,16), (I-6) + (2,17), (I-6) + (2,29), (I-6) + (3,1), (I-6) + (3,2), (I-6) + (3,3), (I-6) + (3,4), (I-6) + (3,9), (I-6) + (3,10), (I-6) + (3,12), (I-6) + (3,16), (I-6) + (3,17), (I-6) + (3,22), (I-6) + (4,6), (I-6) + (5,1), (I-6) + (5,4), (I-6) + (5,5), (I-6) + (5,7), (I-6) + (5,8), (I-6) + (5,9), (I-6) + (5,16), (I-6) + (5,23), (I-6) + (5,25), (I-6) + (5,26), (I-6) + (5,29), (I-6) + (5,30), (I-6) + (7,7), (I-6) + (9,2), (I-6) + (9,4), (I-6) + (9,5), (I-6) + (10,9), (I-6) + (10,10), (I-6) + (12,9), (I-6) + (12,10), (I-6) + (14,4), (I-6) + (15,9), (I-6) + (15,24), (I-6) + (15,25), (I-6) + (15,26), (I-6) + (15,41), (I-6) + (15,42), (I-6) + (15,54), (I-6) + (15,55), (I-6) + (15,56), (I-6) + (15,60), (I-6) + (15,90).

En un modo de realización preferente, la presente invención se refiere a mezclas

que comprenden el compuesto (I-7) como el compuesto de fórmula (I) y un componente (B), en particular las mezclas (I-7) + (1,1), (I-7) + (1,2), (I-7) + (1,3), (I-7) + (1,4), (I-7) + (1,5), (I-7) + (1,6), (I-7) + (1,7), (I-7) + (1,8), (I-7) + (1,9), (I-7) + (1,10), (I-7) + (1,11), (I-7) + (1,12), (I-7) + (1,13), (I-7) + (1,14), (I-7) + (1,15), (I-7) + (1,16), (I-7) + (1,17), (I-7) + (1,18), (I-7) + (1,19), (I-7) + (1,20), (I-7) + (1,21), (I-7) + (1,22), (I-7) + (1,23), (I-7) + (1,24), (I-7) + (1,25), (I-7) + (1,26), (I-7) + (1,27), (I-7) + (1,28), (I-7) + (1,29), (I-7) + (1,30), (I-7) + (1,31), (I-7) + (1,32), (I-7) + (1,33), (I-7) + (1,34), (I-7) + (1,35), (I-7) + (1,36), (I-7) + (1,37), (I-7) + (1,38), (I-7) + (1,39), (I-7) + (1,40), (I-7) + (1,41), (I-7) + (1,42), (I-7) + (1,43), (I-7) + (1,44), (I-7) + (1,45), (I-7) + (1,46), (I-7) + (1,47), (I-7) + (1,48), (I-7) + (1,49), (I-7) + (1,50), (I-7) + (1,51), (I-7) + (1,52), (I-7) + (1,53), (I-7) + (1,54), (I-7) + (1,55), (I-7) + (1,56), (I-7) + (1,57), (I-7) + (1,58), (I-7) + (1,59), (I-7) + (1,60), (I-7) + (1,61), (I-7) + (1,62), (I-7) + (1,63), (I-7) + (1,64), (I-7) + (2,1), (I-7) + (2,2), (I-7) + (2,3), (I-7) + (2,4), (I-7) + (2,5), (I-7) + (2,6), (I-7) + (2,7), (I-7) + (2,8), (I-7) + (2,9), (I-7) + (2,10), (I-7) + (2,11), (I-7) + (2,12), (I-7) + (2,13), (I-7) + (2,14), (I-7) + (2,15), (I-7) + (2,16), (I-7) + (2,17), (I-7) + (2,18), (I-7) + (2,19), (I-7) + (2,20), (I-7) + (2,21), (I-7) + (2,22), (I-7) + (2,23), (I-7) + (2,24), (I-7) + (2,25), (I-7) + (2,26), (I-7) + (2,27), (I-7) + (2,28), (I-7) + (2,29), (I-7) + (3,1), (I-7) + (3,2), (I-7) + (3,3), (I-7) + (3,4), (I-7) + (3,5), (I-7) + (3,6), (I-7) + (3,7), (I-7) + (3,8), (I-7) + (3,9), (I-7) + (3,10), (I-7) + (3,11), (I-7) + (3,12), (I-7) + (3,13), (I-7) + (3,14), (I-7) + (3,15), (I-7) + (3,16), (I-7) + (3,17), (I-7) + (3,18), (I-7) + (3,19), (I-7) + (3,20), (I-7) + (3,21), (I-7) + (3,22), (I-7) + (3,23), (I-7) + (3,24), (I-7) + (3,25), (I-7) + (3,26), (I-7) + (3,27), (I-7) + (3,28), (I-7) + (3,29), (I-7) + (3,30), (I-7) + (3,31), (I-7) + (3,32), (I-7) + (3,33), (I-7) + (4,1), (I-7) + (4,2), (I-7) + (4,3), (I-7) + (4,4), (I-7) + (4,5), (I-7) + (4,6), (I-7) + (4,7), (I-7) + (4,8), (I-7) + (4,9), (I-7) + (4,10), (I-7) + (4,11), (I-7) + (4,12), (I-7) + (4,13), (I-7) + (4,14), (I-7) + (5,1), (I-7) + (5,2), (I-7) + (5,3), (I-7) + (5,4), (I-7) + (5,5), (I-7) + (5,6), (I-7) + (5,7), (I-7) + (5,8), (I-7) + (5,9), (I-7) + (5,10), (I-7) + (5,11), (I-7) + (5,12), (I-7) + (5,13), (I-7) + (5,14), (I-7) + (5,15), (I-7) + (5,16), (I-7) + (5,17), (I-7) + (5,18), (I-7) + (5,19), (I-7) + (5,20), (I-7) + (5,21), (I-7) + (5,22), (I-7) + (5,23), (I-7) + (5,24), (I-7) + (5,25),

(I-7) + (5,26), (I-7) + (5,27), (I-7) + (5,28), (I-7) + (5,29), (I-7) + (5,30), (I-7) + (5,31), (I-7) + (5,32), (I-7) + (5,33), (I-7) + (5,34), (I-7) + (6,1), (I-7) + (6,2), (I-7) + (6,3), (I-7) + (6,4), (I-7) + (7,1), (I-7) + (7,2), (I-7) + (7,3), (I-7) + (7,4), (I-7) + (7,5), (I-7) + (7,6), (I-7) + (7,7), (I-7) + (7,8), (I-7) + (8,1), (I-7) + (8,2), (I-7) + (8,3), (I-7) + (8,4), (I-7) + (9,1), (I-7) + (9,2), (I-7) + (9,3), (I-7) + (9,4), (I-7) + (9,5), (I-7) + (9,6), (I-7) + (9,7), (I-7) + (9,8), (I-7) + (9,9), (I-7) + (10,1), (I-7) + (10,2), (I-7) + (10,3), (I-7) + (10,4), (I-7) + (10,5), (I-7) + (10,6), (I-7) + (10,7), (I-7) + (10,8), (I-7) + (10,9), (I-7) + (10,10), (I-7) + (10,11), (I-7) + (10,12), (I-7) + (10,13), (I-7) + (10,14), (I-7) + (10,15), (I-7) + (11,1), (I-7) + (11,2), (I-7) + (11,3), (I-7) + (11,4), (I-7) + (11,5), (I-7) + (11,6), (I-7) + (11,7), (I-7) + (12,1), (I-7) + (12,2), (I-7) + (12,3), (I-7) + (12,4), (I-7) + (12,5), (I-7) + (12,6), (I-7) + (12,7), (I-7) + (12,8), (I-7) + (12,9), (I-7) + (12,10), (I-7) + (12,11), (I-7) + (12,12), (I-7) + (12,13), (I-7) + (13,1), (I-7) + (13,2), (I-7) + (13,3), (I-7) + (13,4), (I-7) + (13,5), (I-7) + (13,6), (I-7) + (13,7), (I-7) + (14,1), (I-7) + (14,2), (I-7) + (14,3), (I-7) + (14,4), (I-7) + (14,5), (I-7) + (15,1), (I-7) + (15,2), (I-7) + (15,3), (I-7) + (15,4), (I-7) + (15,5), (I-7) + (15,6), (I-7) + (15,7), (I-7) + (15,8), (I-7) + (15,9), (I-7) + (15,10), (I-7) + (15,11), (I-7) + (15,12), (I-7) + (15,13), (I-7) + (15,14), (I-7) + (15,15), (I-7) + (15,16), (I-7) + (15,17), (I-7) + (15,18), (I-7) + (15,19), (I-7) + (15,20), (I-7) + (15,21), (I-7) + (15,22), (I-7) + (15,23), (I-7) + (15,24), (I-7) + (15,25), (I-7) + (15,26), (I-7) + (15,27), (I-7) + (15,28), (I-7) + (15,29), (I-7) + (15,30), (I-7) + (15,31), (I-7) + (15,32), (I-7) + (15,33), (I-7) + (15,34), (I-7) + (15,35), (I-7) + (15,36), (I-7) + (15,37), (I-7) + (15,38), (I-7) + (15,39), (I-7) + (15,41), (I-7) + (15,42), (I-7) + (15,43), (I-7) + (15,44), (I-7) + (15,45), (I-7) + (15,46), (I-7) + (15,47), (I-7) + (15,48), (I-7) + (15,49), (I-7) + (15,50), (I-7) + (15,51), (I-7) + (15,52), (I-7) + (15,53), (I-7) + (15,54), (I-7) + (15,55), (I-7) + (15,56), (I-7) + (15,57), (I-7) + (15,58), (I-7) + (15,59), (I-7) + (15,60), (I-7) + (15,61), (I-7) + (15,62), (I-7) + (15,63), (I-7) + (15,64), (I-7) + (15,65), (I-7) + (15,66), (I-7) + (15,67), (I-7) + (15,68), (I-7) + (15,69), (I-7) + (15,70), (I-7) + (15,71), (I-7) + (15,72), (I-7) + (15,73), (I-7) + (15,74), (I-7) + (15,75), (I-7) + (15,76), (I-7) + (15,77), (I-7) + (15,78), (I-

7) + (15,79), (I-7) + (15,80), (I-7) + (15,81), (I-7) + (15,82), (I-7) + (15,83), (I-7) + (15,84), (I-7) + (15,85), (I-7) + (15,86), (I-7) + (15,87), (I-7) + (15,88), (I-7) + (15,89), (I-7) + (15,90), (I-7) + (15,91), (I-7) + (15,92), (I-7) + (15,93), (I-7) + (15,94).

En otro modo de realización particularmente preferente, la presente invención se refiere a mezclas que comprenden el compuesto (I-7) como el compuesto de fórmula (I) y un componente (B), en particular las mezclas (I-7) + (2,1), (I-7) + (2,2), (I-7) + (2,6), (I-7) + (2,8), (I-7) + (2,11), (I-7) + (2,12), (I-7) + (2,13), (I-7) + (2,14), (I-7) + (2,15), (I-7) + (2,16), (I-7) + (2,17), (I-7) + (2,29), (I-7) + (3,1), (I-7) + (3,2), (I-7) + (3,3), (I-7) + (3,4), (I-7) + (3,9), (I-7) + (3,10), (I-7) + (3,12), (I-7) + (3,16), (I-7) + (3,17), (I-7) + (3,22), (I-7) + (4,6), (I-7) + (5,1), (I-7) + (5,4), (I-7) + (5,5), (I-7) + (5,7), (I-7) + (5,8), (I-7) + (5,9), (I-7) + (5,16), (I-7) + (5,23), (I-7) + (5,25), (I-7) + (5,26), (I-7) + (5,29), (I-7) + (5,30), (I-7) + (7,7), (I-7) + (9,2), (I-7) + (9,4), (I-7) + (9,5), (I-7) + (10,9), (I-7) + (10,10), (I-7) + (12,9), (I-7) + (12,10), (I-7) + (14,4), (I-7) + (15,9), (I-7) + (15,24), (I-7) + (15,25), (I-7) + (15,26), (I-7) + (15,41), (I-7) + (15,42), (I-7) + (15,54), (I-7) + (15,55), (I-7) + (15,56), (I-7) + (15,60), (I-7) + (15,90).

En un modo de realización preferente, la presente invención se refiere a mezclas que comprenden el compuesto (I-8) como el compuesto de fórmula (I) y un componente (B), en particular las mezclas (I-8) + (1,1), (I-8) + (1,2), (I-8) + (1,3), (I-8) + (1,4), (I-8) + (1,5), (I-8) + (1,6), (I-8) + (1,7), (I-8) + (1,8), (I-8) + (1,9), (I-8) + (1,10), (I-8) + (1,11), (I-8) + (1,12), (I-8) + (1,13), (I-8) + (1,14), (I-8) + (1,15), (I-8) + (1,16), (I-8) + (1,17), (I-8) + (1,18), (I-8) + (1,19), (I-8) + (1,20), (I-8) + (1,21), (I-8) + (1,22), (I-8) + (1,23), (I-8) + (1,24), (I-8) + (1,25), (I-8) + (1,26), (I-8) + (1,27), (I-8) + (1,28), (I-8) + (1,29), (I-8) + (1,30), (I-8) + (1,31), (I-8) + (1,32), (I-8) + (1,33), (I-8) + (1,34), (I-8) + (1,35), (I-8) + (1,36), (I-8) + (1,37), (I-8) + (1,38), (I-8) + (1,39), (I-8) + (1,40), (I-8) + (1,41), (I-8) + (1,42), (I-8) + (1,43), (I-8) + (1,44), (I-8) + (1,45), (I-8) + (1,46), (I-8) + (1,47), (I-8) + (1,48), (I-8) + (1,49), (I-8) + (1,50), (I-8) + (1,51), (I-8) + (1,52), (I-8) + (1,53), (I-8) + (1,54), (I-8) + (1,55), (I-8) + (1,56), (I-8) + (1,57),

(I-8) + (1,58), (I-8) + (1,59), (I-8) + (1,60), (I-8) + (1,61), (I-8) + (1,62), (I-8) + (1,63), (I-8) + (1,64), (I-8) + (2,1), (I-8) + (2,2), (I-8) + (2,3), (I-8) + (2,4), (I-8) + (2,5), (I-8) + (2,6), (I-8) + (2,7), (I-8) + (2,8), (I-8) + (2,9), (I-8) + (2,10), (I-8) + (2,11), (I-8) + (2,12), (I-8) + (2,13), (I-8) + (2,14), (I-8) + (2,15), (I-8) + (2,16), (I-8) + (2,17), (I-8) + (2,18), (I-8) + (2,19), (I-8) + (2,20), (I-8) + (2,21), (I-8) + (2,22), (I-8) + (2,23), (I-8) + (2,24), (I-8) + (2,25), (I-8) + (2,26), (I-8) + (2,27), (I-8) + (2,28), (I-8) + (2,29), (I-8) + (3,1), (I-8) + (3,2), (I-8) + (3,3), (I-8) + (3,4), (I-8) + (3,5), (I-8) + (3,6), (I-8) + (3,7), (I-8) + (3,8), (I-8) + (3,9), (I-8) + (3,10), (I-8) + (3,11), (I-8) + (3,12), (I-8) + (3,13), (I-8) + (3,14), (I-8) + (3,15), (I-8) + (3,16), (I-8) + (3,17), (I-8) + (3,18), (I-8) + (3,19), (I-8) + (3,20), (I-8) + (3,21), (I-8) + (3,22), (I-8) + (3,23), (I-8) + (3,24), (I-8) + (3,25), (I-8) + (3,26), (I-8) + (3,27), (I-8) + (3,28), (I-8) + (3,29), (I-8) + (3,30), (I-8) + (3,31), (I-8) + (3,32), (I-8) + (3,33), (I-8) + (4,1), (I-8) + (4,2), (I-8) + (4,3), (I-8) + (4,4), (I-8) + (4,5), (I-8) + (4,6), (I-8) + (4,7), (I-8) + (4,8), (I-8) + (4,9), (I-8) + (4,10), (I-8) + (4,11), (I-8) + (4,12), (I-8) + (4,13), (I-8) + (4,14), (I-8) + (5,1), (I-8) + (5,2), (I-8) + (5,3), (I-8) + (5,4), (I-8) + (5,5), (I-8) + (5,6), (I-8) + (5,7), (I-8) + (5,8), (I-8) + (5,9), (I-8) + (5,10), (I-8) + (5,11), (I-8) + (5,12), (I-8) + (5,13), (I-8) + (5,14), (I-8) + (5,15), (I-8) + (5,16), (I-8) + (5,17), (I-8) + (5,18), (I-8) + (5,19), (I-8) + (5,20), (I-8) + (5,21), (I-8) + (5,22), (I-8) + (5,23), (I-8) + (5,24), (I-8) + (5,25), (I-8) + (5,26), (I-8) + (5,27), (I-8) + (5,28), (I-8) + (5,29), (I-8) + (5,30), (I-8) + (5,31), (I-8) + (5,32), (I-8) + (5,33), (I-8) + (5,34), (I-8) + (6,1), (I-8) + (6,2), (I-8) + (6,3), (I-8) + (6,4), (I-8) + (7,1), (I-8) + (7,2), (I-8) + (7,3), (I-8) + (7,4), (I-8) + (7,5), (I-8) + (7,6), (I-8) + (7,7), (I-8) + (7,8), (I-8) + (8,1), (I-8) + (8,2), (I-8) + (8,3), (I-8) + (8,4), (I-8) + (9,1), (I-8) + (9,2), (I-8) + (9,3), (I-8) + (9,4), (I-8) + (9,5), (I-8) + (9,6), (I-8) + (9,7), (I-8) + (9,8), (I-8) + (9,9), (I-8) + (10,1), (I-8) + (10,2), (I-8) + (10,3), (I-8) + (10,4), (I-8) + (10,5), (I-8) + (10,6), (I-8) + (10,7), (I-8) + (10,8), (I-8) + (10,9), (I-8) + (10,10), (I-8) + (10,11), (I-8) + (10,12), (I-8) + (10,13), (I-8) + (10,14), (I-8) + (10,15), (I-8) + (11,1), (I-8) + (11,2), (I-8) + (11,3), (I-8) + (11,4), (I-8) + (11,5), (I-8) + (11,6), (I-8) + (11,7), (I-8) + (12,1), (I-8) + (12,2), (I-8) + (12,3), (I-8) + (12,4), (I-8) + (12,5), (I-8) + (12,6), (I-8) + (12,7), (I-8) + (12,8), (I-8) + (12,9),

(I-8) + (12,10), (I-8) + (12,11), (I-8) + (12,12), (I-8) + (12,13), (I-8) + (13,1), (I-8) + (13,2), (I-8) + (13,3), (I-8) + (13,4), (I-8) + (13,5), (I-8) + (13,6), (I-8) + (13,7), (I-8) + (14,1), (I-8) + (14,2), (I-8) + (14,3), (I-8) + (14,4), (I-8) + (14,5), (I-8) + (15,1), (I-8) + (15,2), (I-8) + (15,3), (I-8) + (15,4), (I-8) + (15,5), (I-8) + (15,6), (I-8) + (15,7), (I-8) + (15,8), (I-8) + (15,9), (I-8) + (15,10), (I-8) + (15,11), (I-8) + (15,12), (I-8) + (15,13), (I-8) + (15,14), (I-8) + (15,15), (I-8) + (15,16), (I-8) + (15,17), (I-8) + (15,18), (I-8) + (15,19), (I-8) + (15,20), (I-8) + (15,21), (I-8) + (15,22), (I-8) + (15,23), (I-8) + (15,24), (I-8) + (15,25), (I-8) + (15,26), (I-8) + (15,27), (I-8) + (15,28), (I-8) + (15,29), (I-8) + (15,30), (I-8) + (15,31), (I-8) + (15,32), (I-8) + (15,33), (I-8) + (15,34), (I-8) + (15,35), (I-8) + (15,36), (I-8) + (15,37), (I-8) + (15,38), (I-8) + (15,39), (I-8) + (15,41), (I-8) + (15,42), (I-8) + (15,43), (I-8) + (15,44), (I-8) + (15,45), (I-8) + (15,46), (I-8) + (15,47), (I-8) + (15,48), (I-8) + (15,49), (I-8) + (15,50), (I-8) + (15,51), (I-8) + (15,52), (I-8) + (15,53), (I-8) + (15,54), (I-8) + (15,55), (I-8) + (15,56), (I-8) + (15,57), (I-8) + (15,58), (I-8) + (15,59), (I-8) + (15,60), (I-8) + (15,61), (I-8) + (15,62), (I-8) + (15,63), (I-8) + (15,64), (I-8) + (15,65), (I-8) + (15,66), (I-8) + (15,67), (I-8) + (15,68), (I-8) + (15,69), (I-8) + (15,70), (I-8) + (15,71), (I-8) + (15,72), (I-8) + (15,73), (I-8) + (15,74), (I-8) + (15,75), (I-8) + (15,76), (I-8) + (15,77), (I-8) + (15,78), (I-8) + (15,79), (I-8) + (15,80), (I-8) + (15,81), (I-8) + (15,82), (I-8) + (15,83), (I-8) + (15,84), (I-8) + (15,85), (I-8) + (15,86), (I-8) + (15,87), (I-8) + (15,88), (I-8) + (15,89), (I-8) + (15,90), (I-8) + (15,91), (I-8) + (15,92), (I-8) + (15,93), (I-8) + (15,94).

En otro modo de realización particularmente preferente, la presente invención se refiere a mezclas que comprenden el compuesto (I-8) como el compuesto de fórmula (I) y un componente (B), en particular las mezclas (I-8) + (2,1), (I-8) + (2,2), (I-8) + (2,6), (I-8) + (2,8), (I-8) + (2,11), (I-8) + (2,12), (I-8) + (2,13), (I-8) + (2,14), (I-8) + (2,15), (I-8) + (2,16), (I-8) + (2,17), (I-8) + (2,29), (I-8) + (3,1), (I-8) + (3,2), (I-8) + (3,3), (I-8) + (3,4), (I-8) + (3,9), (I-8) + (3,10), (I-8) + (3,12), (I-8) + (3,16), (I-8) + (3,17), (I-8) + (3,22), (I-8) + (4,6), (I-8) + (5,1), (I-8) + (5,4), (I-

8) + (5,5), (I-8) + (5,7), (I-8) + (5,8), (I-8) + (5,9), (I-8) + (5,16), (I-8) + (5,23), (I-8) + (5,25), (I-8) + (5,26), (I-8) + (5,29), (I-8) + (5,30), (I-8) + (7,7), (I-8) + (9,2), (I-8) + (9,4), (I-8) + (9,5), (I-8) + (10,9), (I-8) + (10,10), (I-8) + (12,9), (I-8) + (12,10), (I-8) + (14,4), (I-8) + (15,9), (I-8) + (15,24), (I-8) + (15,25), (I-8) + (15,26), (I-8) + (15,41), (I-8) + (15,42), (I-8) + (15,54), (I-8) + (15,55), (I-8) + (15,56), (I-8) + (15,60), (I-8) + (15,90).

En un modo de realización preferente, la presente invención se refiere a mezclas que comprenden el compuesto (I-9) como el compuesto de fórmula (I) y un componente (B), en particular las mezclas (I-9) + (1,1), (I-9) + (1,2), (I-9) + (1,3), (I-9) + (1,4), (I-9) + (1,5), (I-9) + (1,6), (I-9) + (1,7), (I-9) + (1,8), (I-9) + (1,9), (I-9) + (1,10), (I-9) + (1,11), (I-9) + (1,12), (I-9) + (1,13), (I-9) + (1,14), (I-9) + (1,15), (I-9) + (1,16), (I-9) + (1,17), (I-9) + (1,18), (I-9) + (1,19), (I-9) + (1,20), (I-9) + (1,21), (I-9) + (1,22), (I-9) + (1,23), (I-9) + (1,24), (I-9) + (1,25), (I-9) + (1,26), (I-9) + (1,27), (I-9) + (1,28), (I-9) + (1,29), (I-9) + (1,30), (I-9) + (1,31), (I-9) + (1,32), (I-9) + (1,33), (I-9) + (1,34), (I-9) + (1,35), (I-9) + (1,36), (I-9) + (1,37), (I-9) + (1,38), (I-9) + (1,39), (I-9) + (1,40), (I-9) + (1,41), (I-9) + (1,42), (I-9) + (1,43), (I-9) + (1,44), (I-9) + (1,45), (I-9) + (1,46), (I-9) + (1,47), (I-9) + (1,48), (I-9) + (1,49), (I-9) + (1,50), (I-9) + (1,51), (I-9) + (1,52), (I-9) + (1,53), (I-9) + (1,54), (I-9) + (1,55), (I-9) + (1,56), (I-9) + (1,57), (I-9) + (1,58), (I-9) + (1,59), (I-9) + (1,60), (I-9) + (1,61), (I-9) + (1,62), (I-9) + (1,63), (I-9) + (1,64), (I-9) + (2,1), (I-9) + (2,2), (I-9) + (2,3), (I-9) + (2,4), (I-9) + (2,5), (I-9) + (2,6), (I-9) + (2,7), (I-9) + (2,8), (I-9) + (2,9), (I-9) + (2,10), (I-9) + (2,11), (I-9) + (2,12), (I-9) + (2,13), (I-9) + (2,14), (I-9) + (2,15), (I-9) + (2,16), (I-9) + (2,17), (I-9) + (2,18), (I-9) + (2,19), (I-9) + (2,20), (I-9) + (2,21), (I-9) + (2,22), (I-9) + (2,23), (I-9) + (2,24), (I-9) + (2,25), (I-9) + (2,26), (I-9) + (2,27), (I-9) + (2,28), (I-9) + (2,29), (I-9) + (3,1), (I-9) + (3,2), (I-9) + (3,3), (I-9) + (3,4), (I-9) + (3,5), (I-9) + (3,6), (I-9) + (3,7), (I-9) + (3,8), (I-9) + (3,9), (I-9) + (3,10), (I-9) + (3,11), (I-9) + (3,12), (I-9) + (3,13), (I-9) + (3,14), (I-9) + (3,15), (I-9) + (3,16), (I-9) + (3,17), (I-9) + (3,18), (I-9) + (3,19), (I-9) + (3,20), (I-9) + (3,21), (I-9) + (3,22), (I-9) + (3,23), (I-9) + (3,24), (I-9) + (3,25), (I-9) + (3,26), (I-9) + (3,27), (I-9) + (3,28), (I-9) + (3,29), (I-9) + (3,30),

(I-9) + (3,31), (I-9) + (3,32), (I-9) + (3,33), (I-9) + (4,1), (I-9) + (4,2), (I-9) + (4,3), (I-9) + (4,4), (I-9) + (4,5), (I-9) + (4,6), (I-9) + (4,7), (I-9) + (4,8), (I-9) + (4,9), (I-9) + (4,10), (I-9) + (4,11), (I-9) + (4,12), (I-9) + (4,13), (I-9) + (4,14), (I-9) + (5,1), (I-9) + (5,2), (I-9) + (5,3), (I-9) + (5,4), (I-9) + (5,5), (I-9) + (5,6), (I-9) + (5,7), (I-9) + (5,8), (I-9) + (5,9), (I-9) + (5,10), (I-9) + (5,11), (I-9) + (5,12), (I-9) + (5,13), (I-9) + (5,14), (I-9) + (5,15), (I-9) + (5,16), (I-9) + (5,17), (I-9) + (5,18), (I-9) + (5,19), (I-9) + (5,20), (I-9) + (5,21), (I-9) + (5,22), (I-9) + (5,23), (I-9) + (5,24), (I-9) + (5,25), (I-9) + (5,26), (I-9) + (5,27), (I-9) + (5,28), (I-9) + (5,29), (I-9) + (5,30), (I-9) + (5,31), (I-9) + (5,32), (I-9) + (5,33), (I-9) + (5,34), (I-9) + (6,1), (I-9) + (6,2), (I-9) + (6,3), (I-9) + (6,4), (I-9) + (7,1), (I-9) + (7,2), (I-9) + (7,3), (I-9) + (7,4), (I-9) + (7,5), (I-9) + (7,6), (I-9) + (7,7), (I-9) + (7,8), (I-9) + (8,1), (I-9) + (8,2), (I-9) + (8,3), (I-9) + (8,4), (I-9) + (9,1), (I-9) + (9,2), (I-9) + (9,3), (I-9) + (9,4), (I-9) + (9,5), (I-9) + (9,6), (I-9) + (9,7), (I-9) + (9,8), (I-9) + (9,9), (I-9) + (10,1), (I-9) + (10,2), (I-9) + (10,3), (I-9) + (10,4), (I-9) + (10,5), (I-9) + (10,6), (I-9) + (10,7), (I-9) + (10,8), (I-9) + (10,9), (I-9) + (10,10), (I-9) + (10,11), (I-9) + (10,12), (I-9) + (10,13), (I-9) + (10,14), (I-9) + (10,15), (I-9) + (11,1), (I-9) + (11,2), (I-9) + (11,3), (I-9) + (11,4), (I-9) + (11,5), (I-9) + (11,6), (I-9) + (11,7), (I-9) + (12,1), (I-9) + (12,2), (I-9) + (12,3), (I-9) + (12,4), (I-9) + (12,5), (I-9) + (12,6), (I-9) + (12,7), (I-9) + (12,8), (I-9) + (12,9), (I-9) + (12,10), (I-9) + (12,11), (I-9) + (12,12), (I-9) + (12,13), (I-9) + (13,1), (I-9) + (13,2), (I-9) + (13,3), (I-9) + (13,4), (I-9) + (13,5), (I-9) + (13,6), (I-9) + (13,7), (I-9) + (14,1), (I-9) + (14,2), (I-9) + (14,3), (I-9) + (14,4), (I-9) + (14,5), (I-9) + (15,1), (I-9) + (15,2), (I-9) + (15,3), (I-9) + (15,4), (I-9) + (15,5), (I-9) + (15,6), (I-9) + (15,7), (I-9) + (15,8), (I-9) + (15,9), (I-9) + (15,10), (I-9) + (15,11), (I-9) + (15,12), (I-9) + (15,13), (I-9) + (15,14), (I-9) + (15,15), (I-9) + (15,16), (I-9) + (15,17), (I-9) + (15,18), (I-9) + (15,19), (I-9) + (15,20), (I-9) + (15,21), (I-9) + (15,22), (I-9) + (15,23), (I-9) + (15,24), (I-9) + (15,25), (I-9) + (15,26), (I-9) + (15,27), (I-9) + (15,28), (I-9) + (15,29), (I-9) + (15,30), (I-9) + (15,31), (I-9) + (15,32), (I-9) + (15,33), (I-9) + (15,34), (I-9) + (15,35), (I-9) + (15,36), (I-9) + (15,37), (I-9) + (15,38), (I-9) + (15,39), (I-9) + (15,41), (I-9) + (15,42), (I-9) + (15,43), (I-

9) + (15,44), (I-9) + (15,45), (I-9) + (15,46), (I-9) + (15,47), (I-9) + (15,48), (I-9) + (15,49), (I-9) + (15,50), (I-9) + (15,51), (I-9) + (15,52), (I-9) + (15,53), (I-9) + (15,54), (I-9) + (15,55), (I-9) + (15,56), (I-9) + (15,57), (I-9) + (15,58), (I-9) + (15,59), (I-9) + (15,60), (I-9) + (15,61), (I-9) + (15,62), (I-9) + (15,63), (I-9) + (15,64), (I-9) + (15,65), (I-9) + (15,66), (I-9) + (15,67), (I-9) + (15,68), (I-9) + (15,69), (I-9) + (15,70), (I-9) + (15,71), (I-9) + (15,72), (I-9) + (15,73), (I-9) + (15,74), (I-9) + (15,75), (I-9) + (15,76), (I-9) + (15,77), (I-9) + (15,78), (I-9) + (15,79), (I-9) + (15,80), (I-9) + (15,81), (I-9) + (15,82), (I-9) + (15,83), (I-9) + (15,84), (I-9) + (15,85), (I-9) + (15,86), (I-9) + (15,87), (I-9) + (15,88), (I-9) + (15,89), (I-9) + (15,90), (I-9) + (15,91), (I-9) + (15,92), (I-9) + (15,93), (I-9) + (15,94).

En otro modo de realización particularmente preferente, la presente invención se refiere a mezclas que comprenden el compuesto (I-9) como el compuesto de fórmula (I) y un componente (B), en particular las mezclas (I-9) + (2,1), (I-9) + (2,2), (I-9) + (2,6), (I-9) + (2,8), (I-9) + (2,11), (I-9) + (2,12), (I-9) + (2,13), (I-9) + (2,14), (I-9) + (2,15), (I-9) + (2,16), (I-9) + (2,17), (I-9) + (2,29), (I-9) + (3,1), (I-9) + (3,2), (I-9) + (3,3), (I-9) + (3,4), (I-9) + (3,9), (I-9) + (3,10), (I-9) + (3,12), (I-9) + (3,16), (I-9) + (3,17), (I-9) + (3,22), (I-9) + (4,6), (I-9) + (5,1), (I-9) + (5,4), (I-9) + (5,5), (I-9) + (5,7), (I-9) + (5,8), (I-9) + (5,9), (I-9) + (5,16), (I-9) + (5,23), (I-9) + (5,25), (I-9) + (5,26), (I-9) + (5,29), (I-9) + (5,30), (I-9) + (7,7), (I-9) + (9,2), (I-9) + (9,4), (I-9) + (9,5), (I-9) + (10,9), (I-9) + (10,10), (I-9) + (12,9), (I-9) + (12,10), (I-9) + (14,4), (I-9) + (15,9), (I-9) + (15,24), (I-9) + (15,25), (I-9) + (15,26), (I-9) + (15,41), (I-9) + (15,42), (I-9) + (15,54), (I-9) + (15,55), (I-9) + (15,56), (I-9) + (15,60), (I-9) + (15,90).

En un modo de realización preferente, la presente invención se refiere a mezclas que comprenden el compuesto (I-10) como el compuesto de fórmula (I) y un componente (B), en particular las mezclas (I-10) + (1,1), (I-10) + (1,2), (I-10) + (1,3), (I-10) + (1,4), (I-10) + (1,5), (I-10) + (1,6), (I-10) + (1,7), (I-10) + (1,8), (I-10) + (1,9), (I-10) + (1,10), (I-10) + (1,11), (I-10) + (1,12), (I-10) + (1,13), (I-

10) + (1,14), (I-10) + (1,15), (I-10) + (1,16), (I-10) + (1,17), (I-10) + (1,18), (I-10) + (1,19), (I-10) + (1,20), (I-10) + (1,21), (I-10) + (1,22), (I-10) + (1,23), (I-10) + (1,24), (I-10) + (1,25), (I-10) + (1,26), (I-10) + (1,27), (I-10) + (1,28), (I-10) + (1,29), (I-10) + (1,30), (I-10) + (1,31), (I-10) + (1,32), (I-10) + (1,33), (I-10) + (1,34), (I-10) + (1,35), (I-10) + (1,36), (I-10) + (1,37), (I-10) + (1,38), (I-10) + (1,39), (I-10) + (1,40), (I-10) + (1,41), (I-10) + (1,42), (I-10) + (1,43), (I-10) + (1,44), (I-10) + (1,45), (I-10) + (1,46), (I-10) + (1,47), (I-10) + (1,48), (I-10) + (1,49), (I-10) + (1,50), (I-10) + (1,51), (I-10) + (1,52), (I-10) + (1,53), (I-10) + (1,54), (I-10) + (1,55), (I-10) + (1,56), (I-10) + (1,57), (I-10) + (1,58), (I-10) + (1,59), (I-10) + (1,60), (I-10) + (1,61), (I-10) + (1,62), (I-10) + (1,63), (I-10) + (1,64), (I-10) + (2,1), (I-10) + (2,2), (I-10) + (2,3), (I-10) + (2,4), (I-10) + (2,5), (I-10) + (2,6), (I-10) + (2,7), (I-10) + (2,8), (I-10) + (2,9), (I-10) + (2,10), (I-10) + (2,11), (I-10) + (2,12), (I-10) + (2,13), (I-10) + (2,14), (I-10) + (2,15), (I-10) + (2,16), (I-10) + (2,17), (I-10) + (2,18), (I-10) + (2,19), (I-10) + (2,20), (I-10) + (2,21), (I-10) + (2,22), (I-10) + (2,23), (I-10) + (2,24), (I-10) + (2,25), (I-10) + (2,26), (I-10) + (2,27), (I-10) + (2,28), (I-10) + (2,29), (I-10) + (3,1), (I-10) + (3,2), (I-10) + (3,3), (I-10) + (3,4), (I-10) + (3,5), (I-10) + (3,6), (I-10) + (3,7), (I-10) + (3,8), (I-10) + (3,9), (I-10) + (3,10), (I-10) + (3,11), (I-10) + (3,12), (I-10) + (3,13), (I-10) + (3,14), (I-10) + (3,15), (I-10) + (3,16), (I-10) + (3,17), (I-10) + (3,18), (I-10) + (3,19), (I-10) + (3,20), (I-10) + (3,21), (I-10) + (3,22), (I-10) + (3,23), (I-10) + (3,24), (I-10) + (3,25), (I-10) + (3,26), (I-10) + (3,27), (I-10) + (3,28), (I-10) + (3,29), (I-10) + (3,30), (I-10) + (3,31), (I-10) + (3,32), (I-10) + (3,33), (I-10) + (4,1), (I-10) + (4,2), (I-10) + (4,3), (I-10) + (4,4), (I-10) + (4,5), (I-10) + (4,6), (I-10) + (4,7), (I-10) + (4,8), (I-10) + (4,9), (I-10) + (4,10), (I-10) + (4,11), (I-10) + (4,12), (I-10) + (4,13), (I-10) + (4,14), (I-10) + (5,1), (I-10) + (5,2), (I-10) + (5,3), (I-10) + (5,4), (I-10) + (5,5), (I-10) + (5,6), (I-10) + (5,7), (I-10) + (5,8), (I-10) + (5,9), (I-10) + (5,10), (I-10) + (5,11), (I-10) + (5,12), (I-10) + (5,13), (I-10) + (5,14), (I-10) + (5,15), (I-10) + (5,16), (I-10) + (5,17), (I-10) + (5,18), (I-10) + (5,19), (I-10) + (5,20), (I-10) + (5,21), (I-10) + (5,22), (I-

10) + (5,23), (I-10) + (5,24), (I-10) + (5,25), (I-10) + (5,26), (I-10) + (5,27), (I-10) + (5,28), (I-10) + (5,29), (I-10) + (5,30), (I-10) + (5,31), (I-10) + (5,32), (I-10) + (5,33), (I-10) + (5,34), (I-10) + (6,1), (I-10) + (6,2), (I-10) + (6,3), (I-10) + (6,4), (I-10) + (7,1), (I-10) + (7,2), (I-10) + (7,3), (I-10) + (7,4), (I-10) + (7,5), (I-10) + (7,6), (I-10) + (7,7), (I-10) + (7,8), (I-10) + (8,1), (I-10) + (8,2), (I-10) + (8,3), (I-10) + (8,4), (I-10) + (9,1), (I-10) + (9,2), (I-10) + (9,3), (I-10) + (9,4), (I-10) + (9,5), (I-10) + (9,6), (I-10) + (9,7), (I-10) + (9,8), (I-10) + (9,9), (I-10) + (10,1), (I-10) + (10,2), (I-10) + (10,3), (I-10) + (10,4), (I-10) + (10,5), (I-10) + (10,6), (I-10) + (10,7), (I-10) + (10,8), (I-10) + (10,9), (I-10) + (10,10), (I-10) + (10,11), (I-10) + (10,12), (I-10) + (10,13), (I-10) + (10,14), (I-10) + (10,15), (I-10) + (11,1), (I-10) + (11,2), (I-10) + (11,3), (I-10) + (11,4), (I-10) + (11,5), (I-10) + (11,6), (I-10) + (11,7), (I-10) + (12,1), (I-10) + (12,2), (I-10) + (12,3), (I-10) + (12,4), (I-10) + (12,5), (I-10) + (12,6), (I-10) + (12,7), (I-10) + (12,8), (I-10) + (12,9), (I-10) + (12,10), (I-10) + (12,11), (I-10) + (12,12), (I-10) + (12,13), (I-10) + (13,1), (I-10) + (13,2), (I-10) + (13,3), (I-10) + (13,4), (I-10) + (13,5), (I-10) + (13,6), (I-10) + (13,7), (I-10) + (14,1), (I-10) + (14,2), (I-10) + (14,3), (I-10) + (14,4), (I-10) + (14,5), (I-10) + (15,1), (I-10) + (15,2), (I-10) + (15,3), (I-10) + (15,4), (I-10) + (15,5), (I-10) + (15,6), (I-10) + (15,7), (I-10) + (15,8), (I-10) + (15,9), (I-10) + (15,10), (I-10) + (15,11), (I-10) + (15,12), (I-10) + (15,13), (I-10) + (15,14), (I-10) + (15,15), (I-10) + (15,16), (I-10) + (15,17), (I-10) + (15,18), (I-10) + (15,19), (I-10) + (15,20), (I-10) + (15,21), (I-10) + (15,22), (I-10) + (15,23), (I-10) + (15,24), (I-10) + (15,25), (I-10) + (15,26), (I-10) + (15,27), (I-10) + (15,28), (I-10) + (15,29), (I-10) + (15,30), (I-10) + (15,31), (I-10) + (15,32), (I-10) + (15,33), (I-10) + (15,34), (I-10) + (15,35), (I-10) + (15,36), (I-10) + (15,37), (I-10) + (15,38), (I-10) + (15,39), (I-10) + (15,41), (I-10) + (15,42), (I-10) + (15,43), (I-10) + (15,44), (I-10) + (15,45), (I-10) + (15,46), (I-10) + (15,47), (I-10) + (15,48), (I-10) + (15,49), (I-10) + (15,50), (I-10) + (15,51), (I-10) + (15,52), (I-10) + (15,53), (I-10) + (15,54), (I-10) + (15,55), (I-10) + (15,56), (I-10) + (15,57), (I-10) + (15,58), (I-10) + (15,59), (I-10) + (15,60), (I-10) + (15,61), (I-10) + (15,62), (I-10) + (15,63), (I-10) + (15,64), (I-10) + (15,65), (I-10) + (15,66), (I-

10) + (15,67), (I-10) + (15,68), (I-10) + (15,69), (I-10) + (15,70), (I-10) + (15,71), (I-10) + (15,72), (I-10) + (15,73), (I-10) + (15,74), (I-10) + (15,75), (I-10) + (15,76), (I-10) + (15,77), (I-10) + (15,78), (I-10) + (15,79), (I-10) + (15,80), (I-10) + (15,81), (I-10) + (15,82), (I-10) + (15,83), (I-10) + (15,84), (I-10) + (15,85), (I-10) + (15,86), (I-10) + (15,87), (I-10) + (15,88), (I-10) + (15,89), (I-10) + (15,90), (I-10) + (15,91), (I-10) + (15,92), (I-10) + (15,93), (I-10) + (15,94).

En otro modo de realización particularmente preferente, la presente invención se refiere a mezclas que comprenden el compuesto (I-10) como el compuesto de fórmula (I) y un componente (B), en particular las mezclas (I-10) + (2,1), (I-10) + (2,2), (I-10) + (2,6), (I-10) + (2,8), (I-10) + (2,11), (I-10) + (2,12), (I-10) + (2,13), (I-10) + (2,14), (I-10) + (2,15), (I-10) + (2,16), (I-10) + (2,17), (I-10) + (2,29), (I-10) + (3,1), (I-10) + (3,2), (I-10) + (3,3), (I-10) + (3,4), (I-10) + (3,9), (I-10) + (3,10), (I-10) + (3,12), (I-10) + (3,16), (I-10) + (3,17), (I-10) + (3,22), (I-10) + (4,6), (I-10) + (5,1), (I-10) + (5,4), (I-10) + (5,5), (I-10) + (5,7), (I-10) + (5,8), (I-10) + (5,9), (I-10) + (5,16), (I-10) + (5,23), (I-10) + (5,25), (I-10) + (5,26), (I-10) + (5,29), (I-10) + (5,30), (I-10) + (7,7), (I-10) + (9,2), (I-10) + (9,4), (I-10) + (9,5), (I-10) + (10,9), (I-10) + (10,10), (I-10) + (12,9), (I-10) + (12,10), (I-10) + (14,4), (I-10) + (15,9), (I-10) + (15,24), (I-10) + (15,25), (I-10) + (15,26), (I-10) + (15,41), (I-10) + (15,42), (I-10) + (15,54), (I-10) + (15,55), (I-10) + (15,56), (I-10) + (15,60), (I-10) + (15,90).

Si los principios activos en las combinaciones de principios activos de acuerdo con la invención están presentes en determinadas proporciones en peso, el efecto sinérgico es particularmente pronunciado. Sin embargo, las proporciones en peso de los principios activos en las combinaciones de principios activos se pueden variar dentro de un intervalo relativamente amplio.

En las combinaciones de acuerdo con la invención, los compuestos (A) y (B) están presentes en una proporción en peso sinérgicamente eficaz de A:B en un intervalo de 1000:1 a 1:1000, preferentemente en una proporción en peso de 100:1 a

1:1000, lo más preferentemente en una proporción en peso de 50:1 a 1:500. Otras proporciones de A:B que se pueden usar de acuerdo con la presente invención con preferencia incrementada en el orden dado son: 750:1 a 1:750, 500:1 a 1:500, 300:1 a 1:300, 250:1 a 1:250, 220:1 a 1:220, 200:1 a 1:200, 170:1 a 1:170, 140:1 a 1:140, 120:1 a 1:120, 100:1 a 1:100, 95:1 a 1:95, 90:1 a 1:90, 85:1 a 1:85, 80:1 a 1:80, 75:1 a 1:75, 70:1 a 1:70, 65:1 a 1:65, 60:1 a 1:60, 55:1 a 1:55, 45:1 a 1:45, 40:1 a 1:40, 35:1 a 1:35, 30:1 a 1:30, 25:1 a 1:25, 15:1 a 1:15, 10:1 a 1:10, 5:1 a 1:5, 4:1 a 1:4, 3:1 a 1:3, 2:1 a 1:2 así como 10:1 a 1:1000 y 1:1 a 1:1000.

Cuando un compuesto (A) o un compuesto (B) puede estar presente como mezclas de varias formas isómeras posibles, en particular de estereoisómeros, tales como, por ejemplo, E y Z, treo y eritro, y también isómeros ópticos, y, según sea apropiado, también tautómeros. Lo que se reivindica son tanto los isómeros E y Z, como los treo y eritro, y también los isómeros ópticos (R y S), cualquier mezcla de estos isómeros y también las formas tautómericas posibles.

Los compuestos (A) o compuestos (B) que tienen al menos un centro básico pueden formar, por ejemplo, sales de adición de ácido, por ejemplo, con ácidos inorgánicos fuertes, tales como ácidos minerales, por ejemplo, ácido perclórico, ácido sulfúrico, ácido nítrico, ácido nitroso, un ácido fosfórico o un ácido hidrohálico, con ácidos carboxílicos orgánicos fuertes, tales como insustituidos sustituidos, por ejemplo, halosustituidos, ácidos alcanocarboxílicos C_1-C_4 , por ejemplo, ácido acético, ácidos dicarboxílicos saturados o insaturados, por ejemplo, ácido oxálico, malónico, succínico, maleico, fumárico y ftálico, ácidos hidroxicarboxílicos, por ejemplo, ácido ascórbico, láctico, málico, tartárico y cítrico, o ácido benzoico, o con ácidos sulfónicos orgánicos, tales como insustituido o sustituido, por ejemplo, halo-sustituido, ácidos alcano C_1-C_4- o aril-sulfónicos, por ejemplo, ácido metano- o p-toluen-sulfónico. Los compuestos (A) o compuestos (B) que tienen al menos un grupo ácido pueden formar, por ejemplo, sales con bases, por ejemplo, sales de metales, tales como sales de metales alcalinos o de metales alcalinotérreos, por ejemplo, sales de sodio, potasio o magnesio, o sales

con amoníaco o una amina orgánica, tales como morfolina, piperidina, pirrolidina, una mono-, di- o tri-alquilamina inferior, por ejemplo, etil-, dietil-, trietil- o dimetil-propil-amina, o una mono-, di- o tri-hidroxi-alquilamina inferior, por ejemplo, mono-, di- o tri-etanolamina. Además, también se pueden formar opcionalmente las correspondientes sales internas. En el contexto de la invención, se da preferencia a las sales agroquímicamente ventajosas. En vista de la estrecha relación entre los compuestos (A) o los compuestos (B) en forma libre y en forma de sus sales, anteriormente en el presente documento y a continuación en el presente documento cualquier referencia a los compuestos libres (A) o compuestos libres (B) o a sus sales debe entenderse que incluye también las correspondientes sales o los compuestos libres (A) o compuestos libres (B), respectivamente, cuando sea apropiado y conveniente. El equivalente también se aplica a tautómeros de los compuestos (A) o compuestos (B) y a sus sales.

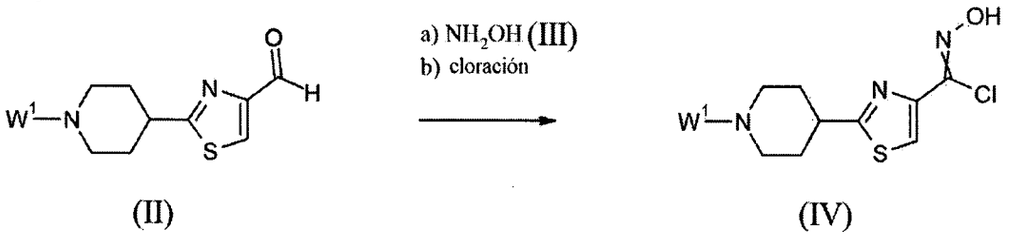
De acuerdo con la invención, la expresión "combinación" quiere decir varias combinaciones de compuestos (A) y (B), por ejemplo en una única forma "premezclada", en una mezcla de pulverización combinada compuesta de formulaciones separadas de los principios activos individuales, tales como una "mezcla en depósito", y en un uso combinado de los ingredientes activos individuales cuando se aplican de manera secuencial, es decir, uno después de otro co un periodo de tiempo razonablemente corto, tal como unas pocas horas o días. Preferentemente, el orden de aplicación de los compuestos (A) y (B) no es esencial para desarrollar la presente invención.

Ilustración de los procedimientos e intermedios

Los derivados de bis(difluorometil)pirazol de la fórmula (I) se pueden preparar de diferentes maneras. En primer lugar, los procedimientos posibles se muestran esquemáticamente a continuación en el presente documento. A menos que se establezca de otro modo, los radicales establecidos son cada uno como se definen anteriormente.

Procedimiento A

Esquema 1: Procedimiento A



(II) (IV)

W^1 es acetilo, alcoxi C_1-C_4-carbonilo, bencilo, benciloxicarbonilo o [3,5-bis(difluorometil)-1H-pirazol-1-il]acetilo

Un medio de preparación de los intermedios **(IV)** a partir del compuesto **(II)** se muestra en el esquema 1 (procedimiento A).

Un compuesto de la fórmula general **(IV)** se obtiene por condensación de un aldehído de la fórmula **(II)** con hidroxilamina (**III**) y posterior cloración (véanse, por ejemplo, los documentos WO 05/0040159, WO 08/013622 y *Synthesis*, **1987**, 11, 998-1001).

En el procedimiento A, se hacen reaccionar en primer lugar el aldehído **(II)** e hidroxilamina (**VII**) (Esquema 1, etapa (a)). Posteriormente, se clora la oxima correspondiente en presencia de un agente de cloración adecuado. Los reactivos de cloración preferentes son N-clorosuccinimida, HClO y cloro. Después de la etapa (a) del procedimiento A, la mezcla de reacción puede procesarse por procedimientos habituales o convertirse además directamente en la etapa (b).

Los aldehídos (**II**) están comercialmente disponibles (para W^1 = t-butoxicarbonilo: Maybridge) o se pueden preparar a partir de precursores comercialmente disponibles por procedimientos descritos en la literatura. Por ejemplo, los aldehídos (**II**) se pueden preparar comenzando con el éster metílico o etílico correspondiente por reducción con hidruro de litio y aluminio en tetrahidrofurano a 0 °C seguido de una oxidación de los alcoholes producidos con reactivo de peryodinano de Dess-Martin a temperatura ambiente en diclorometano (véanse, por ejemplo, los documentos WO 07/147336 a WO 07/039177 para la reducción con hidruro de litio y aluminio y *J. Am. Chem. Soc.* **1978**, 100, 300-301; **1979**, 101,

5294-5299; **1991**, 113, 7277-7287 para la oxidación con reactivo de peryodinano de Dess-Martin).

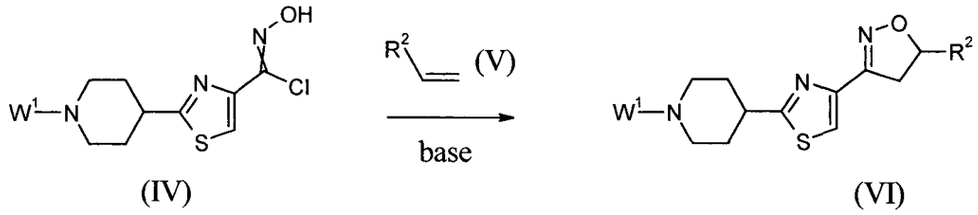
El procedimiento A se realiza preferentemente usando uno o más diluyentes. En la etapa (a) del procedimiento A de acuerdo con la invención, se da preferencia al uso de disolventes próticos, por ejemplo etanol, como disolvente. Después de la formación de la oxima correspondiente a partir del compuesto **(II)**, la mezcla de reacción se diluye en la etapa (b) con otro disolvente, por ejemplo tetrahidrofurano, y después se añade hipoclorito de sodio acuoso. La cloración puede efectuarse también con la ayuda de N-clorosuccinimida en DMF.

En la realización del procedimiento A, las temperaturas de reacción se pueden variar dentro de un intervalo relativamente amplio. En general, las temperaturas empleadas son de -10 °C a +150 °C, preferentemente temperaturas de 0 °C a +100 °C, lo más preferentemente una temperatura de reflujo del disolvente en la etapa (a), y de 0 °C a 30 °C en la etapa (b).

Para realizar el procedimiento A, en general se usan de 1 a 2 moles, preferentemente 1 mol, de hidroxilamina **(III)** y en general de 1 a 5 moles, preferentemente 1 mol, de un agente de cloración por mol de compuesto de la fórmula **(II)**. El tiempo de reacción es de 1 a 48 horas. El procesamiento se efectúa por procedimientos habituales. En caso necesario, los compuestos se purifican por recristalización, destilación o cromatografía u, opcionalmente, se pueden usar también en la etapa siguiente sin purificación previa.

Procedimiento B

Esquema 2: Procedimiento B



(IV) (VI)

W^1 es acetilo, alcoxi C_1-C_4-carbonilo, bencilo, benciloxicarbonilo o [3,5-bis(difluorometil)-1H-pirazol-1-il]acetilo

R2 representa fenilo, que está al menos sustituido con un grupo prop-2-en-1-iloxi o un hidroxi y opcionalmente está sustituido con uno, dos o tres sustituyentes seleccionados del grupo que consiste en metilo, metoxi, fluoro o cloro

En el esquema 2 se muestra un modo de preparación del intermedio **(VI)** a partir del compuesto **(IV)** (procedimiento B).

Un compuesto de la fórmula general (**VI**) se obtiene a partir de un alqueno de fórmula general (**IV**) y el compuesto (**V**) por una reacción de cicloadición (véanse, por ejemplo, el documento WO 08/013622, y *Synthesis*, **1987**, 11, 998-1001).

Los alquenos (**V**) están disponibles comercialmente o se pueden preparar a partir de precursores comercialmente disponibles por procedimientos descritos en la literatura (por ejemplo, a partir de cetonas o aldehídos por una olefinación de Wittig o de Horner-Wadsworth-Emmons: *Chem. Rev.* **1989**, 89, 863-927 una olefinación de Julia: *Tetrahedron Lett.*, **1973**, 14, 4833-4836; olefinaciónd e Peterson: *J. Org. Chem.* **1968**, *33*, 780).

El procedimiento B se realiza en presencia de una base adecuada. Las bases preferentes son aminas terciarias (por ejemplo, trietilamina) y carbonatos de metales alcalinos o metales alcalinotérreos. hidrógenocarbonatos y fosfatos.

El procedimiento B se realiza preferentemente usando uno o más diluyentes. En la realización del procedimiento B, los disolventes orgánicos inertes son una opción preferente (por ejemplo, tolueno y hexano). El agua es también un disolvente posible. De forma alternativa, el procedimiento B se puede realizar en un exceso del alqueno (**V**).

Típicamente, se añaden inicialmente una base adecuada y la olefina (**V**) y se añade el compuesto (**IV**). De forma alternativa, se cargan inicialmente los compuestos (**IV**) y (**V**) y se añade una base adecuada.

En la realización del procedimiento B, las temperaturas de reacción se pueden variar dentro de un intervalo relativamente amplio. En general, las temperaturas empleadas son de -120 °C a +150 °C, preferentemente temperaturas de -10 °C a +100 °C, lo más preferentemente de 0 °C a 30 °C.

Para realizar el procedimiento B, en general, se usan de 0,5 a 5 moles, preferentemente 1 mol, del alqueno (**V**) por mol de compuesto de la fórmula **(IV)**. El tiempo de reacción es de 1 a 48 horas. El procesamiento se efectúa por procedimientos habituales. En caso necesario, los compuestos se purifican por recristalización, destilación o cromatografía u, opcionalmente, se pueden usar también en la etapa siguiente sin purificación previa.

Procedimiento (C)

Esquema 3: Procedimiento (C)



(VI) (VII)

W^1 es acetilo, alcoxi C_1-C_4-carbonilo, bencilo o benciloxicarbonilo

R2 representa fenilo, que está al menos sustituido con un grupo prop-2-en-1-iloxi o un hidroxi y opcionalmente está sustituido con uno, dos o tres sustituyentes seleccionados del grupo que consiste en metilo, metoxi, fluoro o cloro

En el esquema 3 se muestra un modo de preparación de compuestos de la fórmula **(VII)** a partir de los compuestos **(VI)** correspondientes.

Un compuesto de la fórmula (**VI**) se convierte en un compuesto de la fórmula (**VII**) por procedimientos adecuados para retirar los grupos protectores, que se describen en la literatura ("*Protective Groups in Organic Synthesis*"; tercera edición; 1999; 494-653, y literatura citada en él).

Se pueden retirar los grupos protectores terc-butoxicarbonilo y benciloxicarbonilo en un medio ácido (por ejemplo, con ácido clorhídrico o ácido trifluoroacético). Se pueden retirar los grupos protectores acetilo en condiciones básicas (por ejemplo con carbonato de potasio o carbonato de cesio). Se pueden retirar los grupos protectores bencílicos por hidrogenolisis con hidrógeno en presencia de un catalizador (por ejemplo paladio sobre carbono activado).

Los disolventes útiles son todos los disolventes habituales que son inertes en condiciones de reacción, por ejemplo, alcoholes (por ejemplo, metanol, etanol, propanol), éteres cíclicos y acíclicos (por ejemplo, éter dietílico, tetrahidrofurano, dioxano), hidrocarburos aromáticos (por ejemplo, benceno, tolueno, xileno), hidrocarburos halogenados (por ejemplo, diclorometano, cloroformo, tetracloruro de carbono), hidrocarburos aromáticos halogenados (por ejemplo, clorobenceno, diclorobenceno), nitrilos (por ejemplo, acetonitrilo), ésteres carboxílicos (por

ejemplo, acetato de etilo), amidas (por ejemplo, N,N-dimetilformamida, N,N-dimetilacetamida), dimetilsulfóxido, 1,3-dimetil-2-imidazolinona, agua y ácido acético, o la reacción se puede realizar en mezclas de dos o más de estos disolventes.

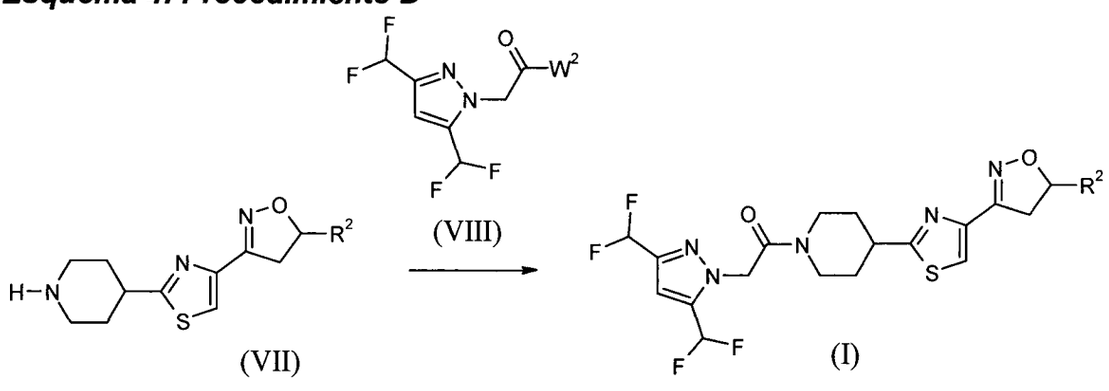
Los ácidos que se pueden usar para esta reacción de desprotección de los grupos t-butoxicarbonilo y benciloxicarbonilo son, por ejemplo, ácido trifluoroacético, ácido clorhídrico u otros ácidos como se describe en la literatura (por ejemplo "*Protective Groups in Organic Synthesis*"; tercera edición; 1999; p. 494-653).

Normalmente, la reacción se realiza a temperaturas de 0 °C a +150 °C y preferentemente a temperatura ambiente, pero también se puede realizar a la temperatura de reflujo de la mezcla de reacción. El tiempo de reacción varía en función de la escala de la reacción y la temperatura de reacción, pero, en general, es de entre una hora y 72 horas.

Después de que haya finalizado la reacción, los compuestos **(VII)** se separan de la mezcla de reacción por una de las técnicas de separación habituales. En caso necesario, los compuestos se purifican por recristalización, destilación o cromatografía o, si se desea, se pueden usar también en la etapa siguiente sin purificación previa. Además, es posible aislar el compuesto de la fórmula general **(VII)** como una sal, por ejemplo como una sal de ácido clorhídrico o de ácido trifluoroacético.

Procedimiento D

Esquema 4: Procedimiento D



W^2 es cloro o OH

R2 representa fenilo, que está al menos sustituido con un grupo prop-2-en-1-iloxi o un hidroxi y opcionalmente está sustituido con uno, dos o tres sustituyentes seleccionados del grupo que consiste en metilo, metoxi, fluoro o cloro

En el esquema 4 se muestra un modo de preparación de compuestos de la fórmula **(I)** a partir de los compuestos **(VII)** correspondientes.

Un compuesto con la fórmula general **(I)** se puede sintetizar de forma análoga a los procedimientos descritos en la literatura (véase, por ejemplo, el documento WO 07/147336), por una reacción de acoplamiento de un compuesto con la fórmula general **(VII)** correspondiente con un sustrato de la fórmula general **(VIIIa)** en el que W^4 = cloro, opcionalmente en presencia de un secuestrante de ácido/una base.

Los compuestos (**VIIIa**) (W^{2a} = cloro) o (**VIIIb**) (W^{2b} = OH) están disponibles comercialmente o bien se pueden preparar por procedimientos descritos en la literatura (véanse, por ejemplo, los documentos WO 08/013622 y WO 08/013925). Además, se puede preparar un sustrato con la fórmula general (**VIIIa**) en la que W^{2a} = cloro, a partir del ácido correspondiente (W^{2b} = OH) por cloración usando procedimientos conocidos de la literatura (por ejemplo, *Tetrahedron* **2005**, 61, 10827-10852, y literatura citada en él).

Los disolventes usados pueden ser todos los disolventes habituales que son inertes en condiciones de reacción, por ejemplo, éteres cíclicos y acíclicos (por ejemplo, éter dietílico, tetrahidrofurano, dioxano), hidrocarburos aromáticos (por ejemplo, benceno, tolueno, xileno), hidrocarburos halogenados (por ejemplo, diclorometano, cloroformo, tetracloruro de carbono), hidrocarburos aromáticos halogenados (por ejemplo, clorobenceno, diclorobenceno) y nitrilos (por ejemplo, acetonitrilo), o la reacción se puede realizar en mezclas de dos o más de estos disolventes. Los disolventes preferentes son tetrahidrofurano y diclorometano.

Se usa al menos un equivalente de un secuestrante de ácidos/una base (p. ej., base de Hünig, trietilamina o secuestrantes de ácido polimérico disponibles

comercialmente) con respecto al material de partida de la fórmula general **(VII)**. Si el material de partida es una sal se necesitan al menos dos equivalentes del secuestrante de ácidos.

Normalmente, la reacción se realiza a temperaturas de 0 °C a 100 °C y preferentemente a de 20 °C a 30 °C, pero también se puede realizar a la temperatura de reflujo de la mezcla de reacción. El tiempo de reacción varía en función de la escala de la reacción y la temperatura de reacción, pero en general, es de entre unos minutos y 48 horas.

Después de que haya finalizado la reacción, los compuestos **(I)** se separan de la mezcla de reacción por una de las técnicas de separación habituales. En caso necesario, los compuestos se purifican por recristalización, destilación o cromatografía u, opcionalmente, se pueden usar también en la etapa siguiente sin purificación previa.

De forma alternativa, también se puede sintetizar un compuesto de la fórmula (I) a partir del compuesto correspondiente de la fórmula (**VII**) con un sustrato de la fórmula (**VIIIb**) en la que W^{2b} = OH en presencia de un agente de acoplamiento, de forma análoga a los procedimientos descritos en la literatura (por ejemplo, *Tetrahedron* **2005**, 61, 10827-10852, y referencias citadas en él).

Los reactivos de acoplamiento adecuados son, por ejemplo, reactivos de acoplamiento peptídico (por ejemplo, N-(3-dimetilaminopropil)-N'-etilcarbodiimida mezclada con 4-dimetilaminopiridina, N-(3-dimetilaminopropil)-N'-etilcarbodiimida mezclada con 1-hidroxi-benzotriazol, hexafluorofosfato de bromotripirrolidinofosfonio, hexafluorofosfato de O-(7-azabenzotriazol-1-il)-N,N,N',N'-tetrametiluronio, etc.).

En caso apropiado, en la reacción se puede usar una base, por ejemplo trietilamina o base de Hünig.

Los sustituyentes hidroxi en R^2 se pueden modificar por procedimientos de reacción que son de conocimiento común para los expertos en la técnica en todas las etapas de la síntesis en la que se producen. Por ejemplo, se pueden alquilar

las funcionalidades OH por procedimientos conocidos con haluros o sulfatos adecuados (véase, por ejemplo, J. March: Advanced Organic Chemistry – Reactions, Mechanisms, and Structures, 4ª Ed. (1992), Wiley, New York, páginas 388-390, 406-407, 411-415). Se pueden encontrar ejemplos de dichas reacciones en la parte de síntesis de esta solicitud.

Los disolventes usados pueden ser todos los disolventes habituales que son inertes en condiciones de reacción, por ejemplo, alcoholes (por ejemplo, metanol, etanol, propanol), éteres cíclicos y acíclicos (por ejemplo, éter dietílico, tetrahidrofurano, dioxano), hidrocarburos aromáticos (por ejemplo, benceno, tolueno, xileno), hidrocarburos halogenados (por ejemplo, diclorometano, cloroformo, tetracloruro de carbono), hidrocarburos aromáticos halogenados (por ejemplo, clorobenceno, diclorobenceno), nitrilos (por ejemplo, acetonitrilo) y amidas (por ejemplo, N,N-dimetilformamida, N,N-dimetilacetamida), o la reacción se puede realizar en mezclas de dos o más de estos disolventes. El disolvente preferente es diclorometano.

Normalmente, la reacción se realiza a temperaturas de 0 °C - 100 °C y preferentemente a de 0 °C - 30 °C, pero también se puede realizar a la temperatura de reflujo de la mezcla de reacción. El tiempo de reacción varía en función de la escala de la reacción y la temperatura de reacción, pero en general, es de entre unos minutos y 48 horas.

Después de que haya finalizado la reacción, los compuestos **(I)** se separan de la mezcla de reacción por una de las técnicas de separación habituales. En caso necesario, los compuestos se purifican por recristalización, destilación o cromatografía u, opcionalmente, se pueden usar también en la etapa siguiente sin purificación previa.

Además, la presente invención se refiere a composiciones para combatir/controlar microorganismos indeseables que comprenden las combinaciones de principios activos de acuerdo con la invención. Preferentemente, las composiciones son composiciones fungicidas que comprenden agentes auxiliares, disolventes,

vehículos, tensioactivos o diluyentes agrícolamente adecuados.

Además, la invención se refiere a un procedimiento para combatir microorganismos indeseables, caracterizado por que las combinaciones de principios activos de acuerdo con la invención se aplican a los hongos fitopatógenos y/o a su hábitat.

De acuerdo con la invención, se entiende que vehículo quiere decir una sustancia natural o sintética, orgánica o inorgánica que se mezcla o se combina con los principios activos para una mejor aplicabilidad, en particular para la aplicación a plantas o partes de plantas o semillas. El vehículo, que puede ser sólido o líquido, en general es inerte y debe ser adecuado para su uso en agricultura.

Los vehículos sólidos o líquidos adecuados son: por ejemplo, sales de amonio y minerales triturados naturales, tales como caolinas, arcillas, talco, caliza, cuarzo, atapulguita, montmorillonita o tierra de diatomeas, y minerales triturados sintéticos, tales como sílice finamente dividida, alúmina y silicatos naturales o sintéticos, resinas, ceras, fertilizantes sólidos, agua, alcoholes, en especial butanol, disolventes orgánicos, aceites minerales y aceites vegetales, y también derivados de los mismos. También es posible usar mezclas de dichos vehículos. Los vehículos sólidos adecuados para gránulos son: por ejemplo minerales naturales machacados y fraccionados, tales como calcita, mármol, piedra pómez, sepiolita, dolomita y también gránulos sintéticos de harinas inorgánicas y orgánicas y también gránulos de material orgánico tales como serrín, cáscaras de coco, mazorcas de maíz y tallos de tabaco.

Las cargas o vehículos gaseosos licuados adecuados son líquidos que son gaseosos a temperatura ambiente y a presión atmosférica, por ejemplo propulsores para aerosoles, tales como butano, propano, nitrógeno y dióxido de carbono.

En las formulaciones se pueden usar agentes de adherencia, tales como carboximetilcelulosa y polímeros naturales y sintéticos en forma de polvos, gránulos y dispersiones poliméricas, tales como goma arábiga, alcohol polivinílico

y acetato de polivinilo, o también fosfolípidos naturales, tales como cefalinas y lecitinas, y fosfolípidos sintéticos. Otros aditivos posibles son aceites minerales y vegetales y ceras, opcionalmente modificadas.

Si el extensor usado es agua, también es posible, por ejemplo, usar disolventes orgánicos como disolventes agentes auxiliares. Los disolventes líquidos adecuados son esencialmente: compuestos aromáticos, tales como xileno, tolueno o alquilnaftalenos, compuestos aromáticos clorados o hidrocarburos alifáticos clorados, tales como clorobencenos, cloroetilenos o cloruro de metileno, hidrocarburos alifáticos, tales como ciclohexano o parafinas, por ejemplo, fracciones de aceites minerales, aceites minerales y vegetales, alcoholes, tales como butanol o glicol y también éteres y ésteres de los mismos, cetonas, tales como acetona, metiletilcetona, metilisobutilcetona o ciclohexanona, disolventes polares fuertes, tales como dimetilformamida y dimetilsulfóxido, y también agua.

Las composiciones de acuerdo con la invención pueden comprender otros componentes adicionales, tales como, por ejemplo, tensioactivos. Los tensioactivos adecuados son emulsionantes, dispersantes o agentes humectantes que tienen propiedades iónicas o no iónicas, o mezclas de estos tensioactivos. Los ejemplos de éstos son sales de ácido poliacrílico, sales de ácido lignosulfónico, sales de ácido fenolsulfónico o ácido naftalenosulfónico, policondensados de óxido de etileno con alcoholes grasos o con ácidos grasos o con aminas grasas, fenoles sustituidos (preferentemente alquilfenoles o arilfenoles), sales de ésteres sulfosuccínicos, derivados de taurina (preferentemente taurato de alquilo), ésteres fosfóricos de alcoholes o fenoles polietoxilados, ésteres grasos de polioles, y derivados de los compuestos que contienen sulfatos, sulfonatos y fosfatos. Se requiere la presencia de un tensioactivo si uno de los principios activos y/o uno de los vehículos inertes es insoluble en agua y cuando la aplicación tiene lugar en agua. La proporción de tensioactivos es entre un 5 y un 40 por ciento en peso de la composición de acuerdo con la invención.

Es posible usar colorantes, tales como pigmentos inorgánicos, por ejemplo óxido

de hierro, óxido de titanio, azul de Prusia, y colorantes orgánicos, tales como colorantes de alizarina, colorantes azoicos y colorantes de ftalocianina metálica y oligonutrientes tales como sales de hierro, manganeso, boro, cobre, cobalto, molibdeno y cinc.

En caso apropiado, también pueden estar presentes otros componentes adicionales, por ejemplo coloides protectores, aglutinantes, adhesivos, espesantes, sustancias tixotrópicas, penetrantes, estabilizantes, agentes secuestrantes, formadores de complejos. En general, los principios activos se pueden combinar con cualquier aditivo sólido o líquido de uso común para fines de formulación.

En general, las composiciones de acuerdo con la invención comprenden entre un 0,05 y un 99 por ciento en peso, entre un 0,01 y un 98 por ciento en peso, preferente entre un 0,1 y un 95 por ciento en peso, particularmente preferente entre un 0,5 y un 90 por ciento en peso de la combinación de principios activos de acuerdo con la invención, muy particularmente preferente entre un 10 y un 70 por ciento en peso.

Las combinaciones de principios activos o composiciones de acuerdo con la invención se pueden usar como tales o, dependiendo de sus respectivas propiedades físicas y/o químicas, en forma de sus formulaciones o las formas de uso preparadas a partir de ellas, tales como aerosoles, suspensiones en cápsulas, concentrados para nebulización fría, concentrados para nebulización caliente, gránulos encapsulados, gránulos finos, concentrados fluidos para el tratamiento de semillas, soluciones listas para usar, polvos para espolvorear, concentrados emulsionables, emulsiones de aceite en agua, emulsiones de agua en aceite, macrogránulos, microgránulos, polvos dispersables en aceite, concentrados fluidos miscibles en aceite, líquidos miscibles en aceite, espumas, pastas, semillas recubiertas con plaguicida, concentrados de suspensión, concentrados de suspoemulsión, concentrados solubles, suspensiones, polvos humectables, polvos solubles, polvos y gránulos, gránulos o comprimidos solubles en agua, polvos

solubles en agua para el tratamiento de semillas, polvos humectables, productos naturales y sustancias sintéticas impregnadas con principio activo, y también microencapsulaciones en sustancias poliméricas y en materiales de recubrimiento para semillas, y también formulaciones para nebulización caliente y fría de ULV.

Las formulaciones mencionadas se pueden preparar de manera conocida *per se*, por ejemplo mezclando los principios activos o las combinaciones de principios activos con al menos un aditivo. Los aditivos adecuados son todos los agentes auxiliares de formulación habituales, tales como, por ejemplo, disolventes orgánicos, extensores, disolventes o diluyentes, vehículos sólidos y cargas, tensioactivos (tales como coadyuvantes, emulsionantes, dispersantes, coloides protectores, agentes humectantes y adherentes), dispersantes y/o aglutinantes o fijadores, conservantes, colorantes y pigmentos, desespumantes, espesantes inorgánicos y orgánicos, repelentes de agua, en caso apropiado, secantes y estabilizantes UV, gibberelinas y también agua y otros agentes auxiliares de procesado. Dependiendo del tipo de formulación que se va a preparar en cada caso, se pueden requerir otras etapas de preparado tales como, por ejemplo, molienda húmeda, molienda seca o granulación.

Las composiciones de acuerdo con la invención no sólo comprenden composiciones listas para usar que se pueden aplicar con aparatos adecuados a la planta o a la semilla, sino también concentrados comerciales que se tienen que diluir con agua antes de su uso.

Las combinaciones de principios activos de acuerdo con la invención se pueden presentar en formulaciones (comerciales) y en las formas de uso preparadas a partir de estas formulaciones como una mezcla con otros principios activos (conocidos), tales como insecticidas, atrayentes, esterilizantes, bactericidas, acaricidas, nematicidas, fungicidas, reguladores del crecimiento, herbicidas, fertilizantes, protectores y semioquímicos.

El tratamiento de acuerdo con la invención de las plantas y partes de las plantas con los principios activos o composiciones se lleva a cabo directamente o por la

acción sobre su entorno, hábitat o espacio de almacenamiento usando procedimientos de tratamiento habituales, por ejemplo, mediante inmersión, pulverización, atomización, irrigación, evaporación, espolvoreado, nebulización, dispersión, espumación, unción, esparcido, riego (empapamiento), irrigación por goteo y, en el caso de material de propagación, en particular en el caso de semillas, además como polvo para el tratamiento de semillas en seco, una solución para el tratamiento de semillas, un polvo soluble en agua para el tratamiento de suspensión espesa, por incrustación, por recubrimiento con una o más capas, etc. También es posible aplicar los principios activos por el procedimiento por volumen ultra bajo o por la inyección en el suelo de la preparación de principios activos o del propio principio activo.

La invención comprende además un procedimiento para tratar semillas. La invención se refiere además a semillas tratadas de acuerdo con uno de los procedimientos descritos en el párrafo precedente.

Los principios activos o composiciones de acuerdo con la invención son especialmente adecuados para tratar semillas. Una gran parte del daño a las plantas de cultivo provocado por organismos perjudiciales se desencadena por una infección de las semillas durante su almacenamiento o después de la siembra, así como durante y después de la germinación de la planta. Esta fase es particularmente crítica, ya que las raíces y los brotes de la planta en crecimiento son particularmente sensibles, e incluso el daño más pequeño puede dar como resultado la muerte de la planta. En consecuencia, existe un gran interés en proteger la semilla y la planta en germinación usando composiciones apropiadas.

El control de hongos fitopatógenos por el tratamiento de semillas de plantas se conoce desde hace mucho tiempo y es objeto de continuas mejoras. Sin embargo, el tratamiento de semillas conlleva una serie de problemas que no siempre se pueden resolver de un modo satisfactorio. Por tanto, es deseable desarrollar procedimientos para proteger las semillas y la planta en germinación que se dispensa con la aplicación adicional de agentes de protección de cultivos después

de la siembra o después de la emergencia de las plantas o que al menos reduzca considerablemente la aplicación adicional. Además, es deseable optimizar la cantidad de principio activo empleado de forma que proporcione una protección máxima para las semillas y la planta en germinación frente al ataque por hongos fitopatógenos, pero sin dañar la propia planta por el principio activo empleado. En particular, los procedimientos para el tratamiento de semillas también deben tener en cuenta las propiedades fungicidas intrínsecas de las plantas transgénicas con el fin de lograr una protección óptima de las semillas y de las plantas en germinación empleándose un mínimo de agentes de protección de cultivos.

En consecuencia, la presente invención también se refiere a un procedimiento para proteger semillas y plantas en germinación contra el ataque por hongos fitopatógenos tratando las semillas con una composición de acuerdo con la invención. La invención también se refiere al uso de las composiciones de acuerdo con la invención para tratar semillas, para proteger las semillas y la planta en germinación contra hongos fitopatógenos. Además, la invención se refiere a semillas tratadas con una composición de acuerdo con la invención para la protección contra hongos fitopatógenos.

El control de hongos fitopatógenos que dañan las plantas después de su emergencia se lleva a cabo principalmente tratando el suelo y las partes aéreas de las plantas con las composiciones de protección de cultivo. Debido a la preocupación en relación con un posible impacto de la composición de protección de cultivos sobre el medio ambiente y la salud de seres humanos y animales, se están realizando esfuerzos para reducir la cantidad de principios activos aplicados.

Una de las ventajas de la presente invención es que, debido a las propiedades sistémicas particulares de las composiciones de acuerdo con la invención, el tratamiento de las semillas con estas composiciones no sólo protege a la semilla en sí, sino también a las plantas resultantes después de la emergencia, de los hongos fitopatógenos. De este modo, se puede prescindir del tratamiento inmediato de los cultivos en el momento de la siembra o poco después.

También se considera ventajoso que se puedan usar las mezclas de acuerdo con la invención en particular también para semillas transgénicas en las que la planta que crece a partir de esta semilla puede expresar una proteína que actúa contra plagas. Al tratar dichas semillas con las combinaciones de principios activos o composiciones de acuerdo con la invención, aún por la expresión, por ejemplo, de la proteína insecticida, se pueden controlar determinadas plagas. De modo sorprendente, se puede observar aquí un efecto sinérgico adicional, lo que incrementa adicionalmente la eficacia de la protección contra al ataque de plagas.

Las composiciones de acuerdo con la invención son adecuadas para proteger semillas de cualquier variedad de planta empleada en agricultura, en invernadero, en bosques o en horticultura o viticultura. En particular, esto toma la forma de semillas de cereales (tales como trigo, cebada, centeno, triticale, mijo, avena), maíz, algodón, soja, arroz, patatas, girasoles, alubias, café, remolachas (por ejemplo, remolachas azucareras y remolachas forrajeras), cacahuetes, colza, amapolas, olivas, cocos, cacao, caña de azúcar, tabaco, vegetables (tales como tomatos, pepinos, cebollas y lechuga), césped y plantas ornamentales (véase además a continuación). El tratamiento de las semillas de cereales (tales como trigo, cebada, centeno, triticale, y avena), maíz y arroz es de particular importancia.

Además, como también se describe a continuación, el tratamiento de semillas transgénicas con las combinaciones de principios activos o composiciones de acuerdo con la invención es de particular importancia. Esto se refiere a semillas de plantas que contienen al menos un gen heterólogo que permite la expresión de un polipéptido o proteína que tiene propiedades insecticidas. El gen heterólogo en semillas transgénicas se puede originar, por ejemplo, de microorganismos de las especies Bacillus, Rhizobium, Pseudomonas, Serratia, Trichoderma, Clavibacter, Glomus o Gliocladium. Preferentemente, este gen heterólogo es de Bacillus sp., el producto génico tiene actividad contra el taladrador del maíz europeo y/o el gusano de la raíz del maíz occidental. De forma particularmente preferente, el gen

heterólogo se origina de Bacillus thuringiensis.

En el contexto de la presente invención, las combinaciones de principios activos o composiciones de acuerdo con la invención se aplican por sí solos o en una formulación adecuada para la semilla. Preferentemente, la semilla se trata en un estado en el que es suficientemente estable de forma que el tratamiento no provoque ningún daño. En general, el tratamiento de las semillas puede tener lugar en cualquier punto en el tiempo entre la cosecha y la siembra. Normalmente, la semilla usada se separa de la planta y se libera de mazorcas, cáscaras, tallos, capas, pelos o la carne de los frutos. Por tanto, es posible el uso, por ejemplo, de semillas que se han cosechado, limpiado y secado hasta un contenido en humedad inferior a un 15 % en peso. De forma alternativa, también es posible el uso de semillas que se han tratado después del secado, por ejemplo, con agua y después se han secado de nuevo.

Cuando se tratan las semillas, en general se debe tener cuidado de que la cantidad de la composición de acuerdo con la invención aplicada a la semilla y/o la cantidad de otros aditivos se elija de modo que la germinación de la semilla no se vea afectada de forma adversa, o que la planta resultante no se dañe. Esto ha de tenerse en mente, en particular, en el caso de principios activos que tengas efectos fitotóxicos a determinadas tasas de aplicación.

Las composiciones de acuerdo con la invención se pueden aplicar directamente, es decir, sin comprender otros componentes y sin que se hayan diluido. En general, es preferente aplicar las composiciones a las semillas en forma de una formulación adecuada. Las formulaciones y procedimientos adecuados para el tratamiento de semillas son conocidos por el experto en la técnica y se describen, por ejemplo, en los siguientes documentos: US 4.272.417 A, US 4.245.432 A, US 4.808.430 A, US 5.876.739 A, US 2003/0176428 A1, WO 2002/080675 A1, WO 2002/028186 A2.

Las combinaciones de principios activos que se pueden usar de acuerdo con la invención se pueden convertir en formulaciones de recubrimiento de semillas

habituales, tales como soluciones, emulsiones, suspensiones, polvos, espumas, suspensiones densas u otros materiales de recubrimiento para semillas, y también formulaciones ULV.

Estas formulaciones se preparan en un modo conocido mezclando los principios activos o las combinaciones de principios activos con aditivos habituales tales como, por ejemplo, diluyentes habituales y también disolventes o diluyentes, colorantes, humectantes, dispersantes, emulsionantes, antiespumantes, conservantes, espesantes secundarios, adhesivos, gibelerinas y también agua.

Los colorantes adecuados que pueden estar presentes en las formulaciones de recubrimiento de semillas que se pueden usar de acuerdo con la invención incluyen todos los colorantes habituales para dichos fines. Se puede hacer uso tanto de pigmentos, de solubilidad moderada en agua, y de tintes, que sean solubles en agua. Los ejemplos que se pueden mencionar incluyen los colorantes conocidos con las designaciones Rhodamina B, C.I. Pigment Red 112, y C.I. Solvent Red 1.

Los agentes humectantes que pueden estar presentes en las formulaciones de recubrimiento de semillas de acuerdo con la invención incluyen todas las sustancias que promueven la humectación y son habituales en la formulación de sustancias agroquímicas activas. Con preferencia, es posible el uso de alquilnaftaleno-sulfonatos, tales como diisopropil- o diisobutilnaftaleno-sulfonatos.

Los dispersantes y/o emulsionantes adecuados que pueden estar presentes en las formulaciones de recubrimiento de semillas que se pueden usar de acuerdo con la invención incluyen todos los dispersantes no iónicos, aniónicos, y catiónicos que son habituales en la formulación de sustancias agroquímicas activas. Con preferencia, es posible el uso de dispersantes no iónicos o aniónicos o mezclas de dispersantes no iónicos o aniónicos. Los dispersantes no iónicos particularmente adecuados son polímeros de bloque de óxido de etileno-óxido de propileno, éteres alquilfenol-poliglicólicos , y éteres tristirilfenol-poliglicólicos, y sus derivados fosfatados o sulfatados. Los dispersantes aniónicos particularmente adecuados

son lignosulfonatos, sales poliacrílicas, y condensados de arilsulfonato-formaldehído.

Los desespumantes que pueden estar presentes en las formulaciones de recubrimiento de semillas que se van a usar de acuerdo con la invención incluyen todos los compuestos inhibidores de espuma que son habituales en la formulación de compuestos agroquímicamente activos. Se da preferencia al uso de desespumantes de silicona, estearato de magnesio, emulsiones de silicona, alcoholes de cadena larga, ácidos grasos y sus sales y también compuestos organofluorados y mezclas de los mismos.

Los conservantes que pueden estar presentes en las formulaciones de recubrimiento de semillas que se van a usar de acuerdo con la invención incluyen todos los compuestos que se pueden usar para dichos fines en composiciones agroquímicas. A modo de ejemplo, se puede hacer mención de diclorofeno y alcohol bencílico hemiformal.

Los espesantes secundarios que pueden estar presentes en las formulaciones de recubrimiento de semillas que se van a usar de acuerdo con la invención incluyen todos los compuestos que se pueden usar para dichos fines en composiciones agroquímicas. Se da preferencia a derivados de celulosa, derivados de ácido acrílico, polisacáridos, tales como goma xantana o Veegum, arcillas modificadas, filosiicatos, tales como atapulguita y bentonita, y también ácidos silícicos finamente divididos.

Los adhesivos adecuados que pueden estar presentes en las formulaciones de recubrimiento de semillas que se van a usar de acuerdo con la invención incluyen todos los aglutinantes habituales que se pueden usar en el recubrimiento de semillas. Se pueden mencionar como preferentes polivinilpirrolidona, acetato de polivinilo, alcohol polivinílico y tilosa.

Las giberelinas adecuadas que pueden estar presentes en las formulaciones de recubrimiento de semillas que se van a usar de acuerdo con la invención pueden ser, preferentemente, las giberelinas A1, A3 (= ácido giberélico), A4 y A7; se da

particular preferencia al uso de ácido giberélico. Las giberelinas son conocidas (véase R. Wegler "Chemie der Pflanzenschutz- und Schädlingsbekämpfungsmittel" [Chemistry of Crop protection Agents y Pesticides], Vol. 2, Springer Verlag, 1970, páginas 401-412).

Las formulaciones de recubrimiento de semillas que se pueden usar de acuerdo con la invención se pueden usar directamente o después de una dilución con agua previa para tratar semillas de cualquiera de una variedad de tipos muy amplia. Las formulaciones de recubrimiento de semillas que se pueden usar de acuerdo con la invención o sus preparaciones diluidas también se pueden usar para recubrir semillas de plantas transgénicas. En este contexto, también se pueden producir efectos sinérgicos en interacción con las sustancias formadas por expresión.

El equipo de mezclado adecuado para tratar semillas con las formulaciones de recubrimiento de semillas que se puede usar de acuerdo con la invención o las preparaciones preparadas de ellas añadiendo agua incluye todos los equipos de mezclado que se pueden usar comúnmente para el recubrimiento. El procedimiento específico adoptado cuando se recubre comprende introducir las semillas en una mezcladora, añadir la cantidad deseada particular de formulación de recubrimiento de semillas, como está o bien después de dilución previa con agua, y llevar a cabo el mezclado hasta que la formulación se distribuya uniformemente sobre las semillas. Opcionalmente, sigue una operación de secado.

Los principios activos o composiciones de acuerdo con la invención tienen una activa microbicida fuerte y se pueden usar para controlar microorganismos no deseados, tales como hongos y bacterias, en protección de cultivos y material de protección.

En la protección de cultivos, se pueden usar fungicidas para el control de plasmodioforomicetos, oomicetos, chitridiomicetos, cigomicetos, ascomicetos, basidiomicetos y deuteromicetos.

En la protección de cultivos, se pueden usar bactericidas para el control de

Pseudomonadaceae, Rhizobiaceae, Enterobacteriaceae, Corynebacteriaceae and Streptomycetaceae.

Las composiciones fungicidas de acuerdo con la invención se pueden usar para el control curativo o protector de hongos fitopatógenos. En consecuencia, la invención también se refiere a procedimientos curativos y protectores para controlar hongos fitopatógenos usando las combinaciones de principios activos o composiciones de acuerdo con la invención, que se aplican a las semillas, la planta o partes de planta, el fruto o el suelo en el que crecen las plantas. Se da preferencia a la aplicación sobre la planta o las partes de la planta, los frutos o el suelo en el que crecen las plantas.

Las composiciones de acuerdo con la invención para combatir los hongos fitopatógenos en la protección de cultivos comprenden una cantidad activa, pero no fitotóxica de los compuestos de acuerdo con la invención. "Cantidad activa, pero no fitotóxica" quiere decir una cantidad de la composición de acuerdo con la invención que sea suficiente para controlar o matar completamente la enfermedad de la planta provocada por hongos, cantidad que al mismo tiempo no presente síntomas notables de fitotoxicidad. En general, estas tasas de aplicación se pueden variar en un amplio intervalo, tasa que depende de varios factores, por ejemplo, los hongos fitopatógenos, la planta o el cultivo, las condiciones climáticas y los ingredientes de la composición de acuerdo con la invención.

El hecho de que los principios activos, en las concentraciones requeridas para el control de las enfermedades de plantas, sean bien tolerados por las plantas, permite el tratamiento de partes de plantas aéreas, del material de propagación vegetal y de la semilla, y del suelo.

De acuerdo con la invención, es posible tratar todas las plantas y partes de las plantas. En el presente documento, se entiende que plantas significa todas las plantas y poblaciones de plantas, tales como plantas silvestres deseadas y no deseadas o plantas de cultivo (incluyendo plantas de cultivo de origen natural). Las plantas de cultivo pueden ser plantas que se pueden obtener por

procedimientos de cultivo y optimización convencionales o por procedimientos biotecnológicos y de ingeniería genética o por combinaciones de estos procedimientos, incluyendo las plantas transgénicas e incluyendo las variedades de cultivo que pueden estar o no protegidas por los derechos de protección de las variedad de plantas. Se debe entender que partes de plantas significa todas las partes y órganos de las plantas aéreos y subterráneos, tales como brote, hoja, flor y raíz, pudiendo mencionarse como ejemplos hojas, espinas, tallos, troncos, flores, cuerpos frutales, frutos y semillas, y también raíces, tubérculos y rizomas. Las partes de las plantas también incluyen el material cosechado y el material de propagación vegetativa y por generación, por ejemplo plantones, tubérculos, rizomas, esquejes y semillas. Se da preferencia al tratamiento de las plantas y las partes o órganos de las plantas aéreos y subterráneos, tales como brote, hoja, flor y raíz, pudiendo mencionarse como hojas, espinas, tallos, troncos, flores, y frutos.

Los principios activos de la invención, en combinación con una tolerancia de la planta buena y una toxicidad favorable para animales de sangre caliente y tolerándose bien por el entorno, son adecuados para proteger plantas y órganos de plantas, para incrementar el rendimiento de la cosecha, para mejorar la calidad del material cosechado. Preferentemente, se pueden emplear como agentes de protección de cultivos. Son activos contra especies normalmente sensibles y resistentes y contra todos o algunos estadios de desarrollo.

Las siguientes plantas se pueden mencionar como plantas que se pueden tratar de acuerdo con la invención: algodón, lino, vid, fruta, verdura, tales como *Rosaceae sp.* (por ejemplo frutos con pepitas, tales como manzanas y peras, pero también frutos con hueso, tales como albaricoques, cerezas, almendras y melocotones y frutos blandos tales como fresas), *Ribesioidae sp.*, *Juglandaceae sp.*, *Betulaceae sp.*, *Anacardiaceae sp.*, *Fagaceae sp.*, *Moraceae sp.*, *Oleaceae sp.*, *Actinidaceae sp.*, *Lauraceae sp.*, *Musaceae sp.* (por ejemplo plátano y plantaciones), *Rubiaceae sp.* (por ejemplo, café), *Theaceae sp.*, *Sterculiceae sp.*, *Rutaceae sp.* (por ejemplo, limones, naranjas y pomelo), *Solanaceae sp.* (por

ejemplo, tomates), *Liliaceae sp.*, *Asteraceae sp.* (por ejemplo, lechuga), *Umbelliferae sp.*, *Cruciferae sp.*, *Chenopodiaceae sp.*, *Cucurbitaceae sp.* (por ejemplo, pepinos), *Alliaceae sp.* (por ejemplo, puerro, cebollas), *Papilionaceae sp.* (por ejemplo, guisantes); principales plantas de cultivo, tales como *Graminaae sp.* (por ejemplo maíz, pasto, cereales tales como trigo, centeno, arroz, cebada, avena, mijo y triticale), *Asteraceae sp.* (por ejemplo, girasoles), *Brassicaceae sp.* (por ejemplo, col blanca, col lombarda, brócoli, coliflor, coles de Bruselas, pak choi, colirrábano, rábanos de jardín, y también colza, mostaza, rábano picante y berro), *Fabacae sp.* (por ejemplo, alubias, guisantes, cacahuetes), *Papilionaceae sp.* (por ejemplo, soja), *Solanaceae sp.* (por ejemplo patatas), *Chenopodiaceae sp.* (por ejemplo, remolacha azucarera, remolacha forrajera, acelga, remolacha); plantas de cultivo y plantas ornamentales en jardín y bosques; y también en cada caso variedades modificadas genéticamente de estas plantas.

Como ya se ha mencionado anteriormente, es posible tratar todas las plantas y sus partes de acuerdo con la invención. En un modo de realización preferente, se tratan las especies de plantas silvestres y variedades de cultivo, o las obtenidas por procedimientos de cultivo biológicos convencionales, tales como cruzamiento o fusión de protoplastos, y partes de los mismos. En otro modo de realización preferente, se tratan las plantas transgénicas y variedades de cultivo obtenidas por procedimientos de ingeniería genética, en caso apropiado en combinación con procedimientos convencionales (organismos modificados genéticamente), y partes de las mismas. Los términos "partes" y "partes de plantas" se han explicado anteriormente. De forma particularmente preferente, las plantas de las variedades de cultivo que, en cada caso, están disponibles comercialmente o en uso se tratan de acuerdo con la invención. Se debe entender que variedades de cultivo quiere decir plantas que tienen propiedades novedosas ("rasgos característicos") que se han obtenido por técnicas de cultivo convencionales, por mutagénesis o por técnicas de ADN recombinante. Estas pueden ser variedades, bio- o genotipos.

El procedimiento de tratamiento de acuerdo con la invención se usa en el

tratamiento de organismos modificados genéticamente (OMG), por ejemplo, plantas o semillas. Plantas modificadas genéticamente (o plantas transgénicas) son plantas en las que se ha integrado de manera estable un gen heterólogo en el genoma. La expresión "gen heterólogo" quiere decir, en esencia, un gen que se proporciona o se ensambla fuera de la planta y que, cuando se introduce en el genoma nuclear, cloroplástico o mitocondrial, confiere a la planta transformada propiedades agronómicas, u otras, nuevas o mejoradas, por la expresión de una proteína o un polipéptido de interés o por regulación por disminución o por anulación de otro(s) gen(es) que está(n) presente(s) en la planta (usando, por ejemplo, tecnología antisentido, tecnología de co-supresión o tecnología de interferencia de ARN (ARNi)). Un gen heterólogo que está localizado en el genoma también se denomina transgén. Un transgén que se define por su presencia particular en el genoma de la planta se denomina un acontecimiento de transformación o transgénico.

Dependiendo de la especie de planta o la variedad de cultivo, su localización y condiciones de cultivo (suelos, clima, periodo de vegetación, dieta), el tratamiento de acuerdo con la invención también puede dar lugar a afectos superaditivos ("sinérgicos"). Así, por ejemplo, son posibles tasas de aplicación reducidas y/o una ampliación del espectro de actividad y/o un aumento en la actividad de los principios activos y composiciones que se pueden usar de acuerdo con la invención, mejor crecimiento de las plantas, aumento de la tolerancia frente a altas o bajas temperaturas, aumento de la tolerancia frente a la sequía o al contenido en agua o sal del suelo, aumento del rendimiento de floración, cosecha más fácil, maduración acelerada, mayores rendimientos de cosecha, frutos más grandes, mayor altura de la planta, hojas de un verde más intenso, floración más temprana, mayor calidad y/o mayor valor nutricional de los productos cosechados, mayor concentración de azúcar en los frutos, mejor estabilidad en almacenamiento y/o procesabilidad de los productos cosechados, que exceden los efectos que realmente se esperaban.

A determinadas tasas de aplicación, las combinaciones de principios activos de acuerdo con la invención también pueden tener un efecto fortalecedor sobre las plantas. En consecuencia, también son adecuados para movilizar el sistema de defensa de la planta frente al ataque de hongos fitopatógenos y/o microorganismos y/o virus no deseados. Esta puede ser, si procede, una de las razones de la actividad potenciada de las combinaciones de acuerdo con la invención, por ejemplo contra hongos. Se debe entender que sustancias para el fortalecimiento de las plantas (inductoras de resistencia) quiere decir, en el presente contexto, aquellas sustancias o combinaciones de sustancias que pueden estimular el sistema de defensa de las plantas de tal modo que, cuando posteriormente se inoculan con hongos fitopatógenos y/o microorganismos y/o virus no deseados, las plantas tratadas presentan un grado sustancial de resistencia a estos hongos fitopatógenos y/o microorganismos y/o virus. Por tanto, las sustancias de acuerdo con la invención se pueden emplear para proteger plantas frente al ataque por los patógenos mencionados anteriormente dentro de un periodo de tiempo determinado después del tratamiento. En general, el periodo de tiempo dentro del que se efectúa la protección se extiende desde 1 hasta 10 días, preferentemente de 1 a 7 días, después del tratamiento de las plantas con los principios activos.

Las plantas y variedades de cultivo que se van a tratar preferentemente de acuerdo con la invención incluyen todas las plantas que tienen material genético que imparte a estas plantas rasgos útiles particularmente ventajosos (con independencia de si se obtuvieron por medios de cultivo y/o biotecnología).

Las plantas y variedades de cultivo que también se van a tratar preferentemente de acuerdo con la invención son resistentes contra uno o más factores de estrés biótico, es decir, estas plantas muestran una defensa mejor contra plagas de animales o microbianas, tales como nematodos, insectos, ácaros, hongos fitopatógenos, bacterias, virus y/o viroides.

Las plantas y variedades de cultivo que también se pueden tratar de acuerdo con

la invención son las plantas que son resistentes a uno o más factores de estrés abiótico. Las condiciones de estrés abiótico pueden incluir, por ejemplo, sequía, exposición a temperatura fría, exposición al calor, estrés osmótico, inundación, aumento de la salinidad del suelo, aumento de la exposición a minerales, exposición a ozono, exposición a la luz intensa, disponibilidad limitada de nutrientes nitrogenados, disponibilidad limitada de nutrientes fosforados, evitación de la sombra.

Las plantas y variedades de cultivo de plantas que también se pueden tratar de acuerdo con la invención son las plantas caracterizadas por tener características de rendimiento potenciadas. El aumento en el rendimiento en dichas plantas puede ser consecuencia, por ejemplo, de la mejora de la fisiología, el crecimiento y el desarrollo de la planta, tal como el uso eficiente del agua, retención eficiente del agua, uso de nitrógeno mejorado, asimilación de carbono potenciada, fotosíntesis mejorada, mayor eficacia de germinación y maduración acelerada. Además, el rendimiento se puede ver afectado por una arquitectura de la planta mejorada (en condiciones de estrés o de no estrés), incluyendo, pero sin limitación, floración temprana, control de la floración para producción de semillas híbridas, fortaleza de la plántula, tamaño de la planta, número y distancia entre los internodios, crecimiento de la raíz, tamaño de la semilla, tamaño del fruto, tamaño de la vaina, número de vainas o espigas, número de semillas por vaina o espiga, peso de la semilla, relleno de la semilla potenciado, reducción de la dispersión de semillas, reducción de la dehiscencia de las vainas y resistencia al encamado. Otros rasgos de rendimiento incluyen la composición de la semilla, tal como el contenido en hidratos de carbono, el contenido en proteínas, el contenido y la composición del aceite, el valor nutricional, la reducción de compuestos desfavorables para la nutrición, la mejora de la procesabilidad y mejor estabilidad en almacenamiento.

Las plantas que se pueden tratar de acuerdo con la invención son plantas híbridas que ya expresan las características de heterosis o fortaleza híbrida, lo que en

general da lugar a un mayor rendimiento, fortaleza, salud y resistencia frente a factores de estrés biótico y abiótico. Típicamente, estas plantas se producen cruzando una línea parental estéril masculina endogámica (el progenitor femenino) con otra línea parental fértil masculina endogámica (el progenitor masculino). Típicamente, se cosecha la semilla híbrida de las plantas estériles masculinas y se vende a los productores. En ocasiones, se pueden producir plantas estériles masculinas (por ejemplo, en maíz) despenachado (es decir, retirada mecánica de los órganos reproductores masculinos (o flores masculinas), pero, más típicamente, la esterilidad masculina es el resultado de determinantes genéticos en el genoma de la planta. En ese caso, y especialmente cuando la semilla es el producto que se desea cosechar a partir de las plantas híbridas, típicamente es útil garantizar que la fertilidad masculina de las plantas híbridas está totalmente restablecida. Esto se puede llevar a cabo garantizando que los progenitores masculinos tengan genes restablecedores de fertilidad apropiados que sean capaces de restablecer la fertilidad masculina en plantas híbridas que contienen los determinantes genéticos responsables de esterilidad masculina. Los determinantes genéticos de la esterilidad masculina pueden estar localizados en el citoplasma. Se han descrito ejemplos de esterilidad masculina citoplásmica (CMS), por ejemplo, en especies de Brassica. Sin embargo, los determinantes genéticos de la esterilidad masculina también pueden estar localizados en el genoma nuclear. También se pueden obtener plantas estériles masculinas mediante procedimientos de biotecnología de plantas, tales como ingeniería genética. En el documento WO 89/10396 se describe un modo particularmente útil de obtención de plantas estériles masculinas, en las que, por ejemplo, se expresa selectivamente una ribonucleasa, tal como barnasa, en las células del tapete de los estambres. La fertilidad se puede restaurar a continuación, por la expresión en las células del tapete de un inhibidor de ribonucleasa, tal como barstar.

Las plantas o variedades de cultivo de plantas (obtenidas por procedimientos de biotecnología de plantas tales como ingeniería genética) que se pueden tratar de

acuerdo con la invención son plantas tolerantes a herbicidas, es decir, plantas que se han hecho tolerantes a uno o más herbicidas dados. Se pueden obtener plantas de este tipo bien por transformación genética o bien por selección de plantas que contienen una mutación que confiere dicha tolerancia a herbicidas.

Son plantas tolerantes a herbicidas, por ejemplo, plantas tolerantes a glifosato, es decir, plantas que se han hecho tolerantes al herbicida glifosato o sales del mismo. Las plantas se pueden hacer tolerantes a glifosato por diferentes medios. Por ejemplo, se pueden obtener plantas tolerantes a glifosato transformando la planta con un gen que codifica la enzima 5-enolpiruvilshikimato-3-fosfato sintasa (EPSPS). Ejemplos de dichos genes EPSPS son el gen aroA (mutante CT7) de la bacteria *Salmonella typhimurium,* el gen CP4 de la bacteria *Agrobacterium sp.,* los genes que codifican una EPSPS de la petunia, una EPSPS del tomate o una EPSPS de la eleusina. También puede ser una EPSPS mutada. Las plantas tolerantes al glifosato también se pueden obtener por expresión de un gen que codifica una enzima glifosato oxidorreductasa. Las plantas tolerantes al glifosato también se pueden obtener por expresión de un gen que codifica la enzima glifosato acetiltransferasa. Las plantas tolerantes al glifosato también se pueden obtener por selección de plantas que contengan mutaciones de origen natural de los genes mencionados anteriormente.

Otras plantas resistentes a herbicidas son, por ejemplo, plantas que se han hecho tolerantes a herbicidas que inhiben la enzima glutamina sintasa, tales como bialafos, fosfinotricina o glufosinato. Se pueden obtener dichas plantas por expresión de una enzima que desintoxique el herbicida o una enzima glutamina sintasa mutante que sea resistente a la inhibición. Una enzima desintoxicante eficaz de este tipo es, por ejemplo, una enzima que codifica una fosfinotricina acetiltransferasa (tal como la proteína bar o pat de especies de *Streptomyces*). También se han descrito plantas que expresan una fosfinotricina acetiltransferasa exógena.

Otras plantas tolerantes a herbicidas también son plantas que se han hecho

tolerantes a los herbicidas que inhiben la enzima hidroxifenilpiruvato dioxigenasa (HPPD). Las hidroxifenilpiruvato dioxigenasas son enzimas que catalizan la reacción en la que se transforma para-hidroxifenilpiruvato (HPP) en homogentisato. Se pueden transformar plantas tolerantes a inhibidores de HPPD con un gen que codifique una enzima HPPD resistente de origen natural o un gen que codifique una enzima HPPD mutada. También se puede obtener tolerancia a inhibidores de HPPD transformando plantas con genes que codifican determinadas enzimas que permiten la formación de homogentisato a pesar de la inhibición de la enzima HPPD nativa por el inhibidor de HPPD. La tolerancia de plantas a los inhibidores HPPD también se puede mejorar por la transformación de plantas con un gen que codifica una enzima prefenato dehidrogenasa además de con un gen que codifica una enzima tolerante al HPPD.

Otras plantas resistentes a herbicidas son plantas que se hacen tolerantes a inhibidores de la acetolactato sintasa (ALS). Los inhibidores de la ALS conocidos incluyen, por ejemplo, herbicidas de sulfonilurea, imidazolinona, triazolopirimidinas, pirimidiniloxi(tio)benzoatos y/o sulfonilaminocarboniltriazolinona. Las diferentes mutaciones en la enzima ALS (también conocida como ácido acetohidroxi sintasa, AHAS) son conocidas por conferir tolerancia a diversos herbicidas y grupos de herbicidas. La producción de plantas tolerantes a sulfonilurea y de plantas tolerantes a imidazolinona se describe en el documento WO 1996/033270. También se describen otras plantas tolerantes a imidazolinona. También se describen otras plantas tolerantes a sulfonilurea e imidazolinona, por ejemplo, en el documento WO 2007/024782.

Se pueden obtener otras plantas tolerantes a imidazolinona y/o sulfonilurea por mutagénesis inducida, selección en cultivos celulares en presencia del herbicida o cultivo por mutación como se describe, por ejemplo, para soja, para arroz, para remolacha azucarera, para lechuga, o para girasol.

Las plantas o variedades de cultivo (obtenidas por procedimientos de biotecnología de plantas tales como ingeniería genética) que también se pueden

tratar de acuerdo con la invención son plantas transgénicas resistentes a insectos, es decir, plantas que se han hecho resistentes al ataque de determinados insectos objetivo. Estas plantas se pueden obtener por transformación genética o por selección de plantas que contienen una mutación que confiere dicha resistencia a insectos.

Una "planta transgénica resistente a insectos", como se usa en el presente documento, incluye cualquier planta que contenga al menos un transgén que comprenda una secuencia codificante que codifica:

1) una proteína cristalina insecticida de *Bacillus thuringiensis* o una porción insecticida de la misma, tal como las proteínas cristalinas insecticidas enumeradas en Internet en: http://www.lifesci.sussex.ac.uk/Home/Neil_Crickmore/Bt/, o porciones insecticidas de las mismas, por ejemplo, proteínas de las clases de proteínas Cry: Cry1Ab, Cry1Ac, Cry1F, Cry2Ab, Cry3Ae o bien Cry3Bb o porciones insecticidas de las mismas; o

2) una proteína cristalina de *Bacillus thuringiensis* o una porción de la misma que es insecticida en presencia de una segunda proteína cristalina diferente de *Bacillus thuringiensis* o una porción de la misma, tal como la toxina binaria, compuesta de las proteínas cristalinas Cy34 y Cy35; o

3) una proteína insecticida híbrida que comprende partes de diferentes proteínas cristalinas insecticidas de *Bacillus thuringiensis*, tal como un híbrido de las proteínas de 1) anteriores o un híbrido de las proteínas de 2) anteriores, por ejemplo, la proteína Cry1A.105 producida por el acontecimiento del maíz MON98034 (en el documento WO 2007/027777); o

4) una proteína de uno cualquiera de los puntos 1) a 3) anteriores, en la que se han reemplazado algunos aminoácidos, en particular de 1 a 10, por otro aminoácido, para obtener una mayor actividad insecticida frente a una especie de insectos objetivo y/o para ampliar el espectro de especies de insectos objetivo afectados y/o debido a las modificaciones introducidas en

el ADN codificante durante la clonación o la transformación, tales como la proteína Cry3Bb1 en los eventos del maíz MON863 o MON88017 o la proteína Cry3A en el acontecimiento del maíz MIR 604;

5) una proteína secretada insecticida de *Bacillus thuringiensis* o *Bacillus cereus*, o una porción insecticida de la misma, tal como las proteínas insecticidas vegetativas (VIP) enumeradas en: http://www.lifesci.sussex.ac.uk/home/Neil_Crickmore/Bt/vip.html, por ejemplo, proteínas de la clase de proteínas VIP3Aa; o

6) una proteína secretada por *Bacillus thuringiensis* o *Bacillus cereus*, que en presencia de una segunda proteína secretada por el *Bacillus thuringiensis* o el *B. cereus* tiene actividad insecticida, tal como la toxina binaria compuesta por las proteínas VIP1A y VIP2A; o

7) una proteína insecticida híbrida que comprende partes de diferentes proteínas secretadas de *Bacillus thuringiensis* o *Bacillus cereus*, tal como un híbrido de las proteínas de 1) anteriores o un híbrido de las proteínas de 2) anteriores; o

8) una proteína de uno cualquiera de 1) a 3) anteriores, en la que se han reemplazado algunos aminoácidos, en particular de 1 a 10, por otro aminoácido para obtener una mayor actividad insecticida frente a una especie de insectos objetivo, y/o para ampliar la variedad de especies de insectos objetivo afectadas, y/o debido a cambios introducidos en el ADN codificante durante la clonación o la transformación (al mismo tiempo que se codifica una proteína insecticida), tal como la proteína VIP3Aa en el evento del algodón COT102.

Evidentemente, una planta transgénica resistente a insectos, como se usa en el presente documento, también incluye cualquier planta que comprenda una combinación de genes que codifican las proteínas de una cualquiera de las clases 1 a 8 anteriores. En una realización, una planta resistente a insectos contiene más de un transgén que codifica una proteína de una cualquiera de las clases 1 a 8

anteriores, para ampliar la variedad de especies de insectos objetivo afectadas cuando se usan diferentes proteínas dirigidas a especies de insectos objetivo diferentes, o para retardar el desarrollo de resistencia de los insectos a las plantas usando diferentes proteínas insecticidas para las mismas especies de insectos objetivo pero con un modo de acción diferente, tal como la unión a sitios de unión a receptor diferentes en el insecto.

Las plantas o variedades de cultivo de planta (obtenidas por procedimientos de biotecnología de plantas tales como ingeniería genética) que también se pueden tratar de acuerdo con la invención son tolerantes a factores de estrés abiótico. Se pueden obtener plantas de este tipo por transformación genética o por selección de plantas que contienen una mutación que confiere dicha resistencia al estrés. Las plantas de tolerancia al estrés particularmente útiles incluyen:

a. plantas que contienen un transgén que puede reducir la expresión y/o la actividad del gen de la poli(ADP-ribosa) polimerasa (PARP) en las células de plantas o en las plantas.

b. plantas que contienen un transgén que potencia la tolerancia al estrés que puede reducir la expresión y/o la actividad de genes de plantas o de células de plantas que codifican PARG;

c. plantas que contienen un transgén que potencia la tolerancia al estrés que codifica una enzima funcional de plantas de la ruta de síntesis de salvamento de nicotinamida adenina dinucleótido, incluyendo nicotinamidasa, nicotinato fosforribosiltransferasa, ácido nicotínico mononucleótido adeniltransferasa, nicotinamida adenina dinucleotidosintetasa o nicotinamida fosforribosiltransferasa.

Las plantas o variedades de cultivo (obtenidas por procedimientos de biotecnología vegetal, como la ingeniería genética), que también se pueden tratar de acuerdo con la invención, presentan una cantidad, calidad y/o estabilidad en almacenamiento del producto cosechado alteradas y/o propiedades alteradas de ingredientes específicos del producto cosechado, tales como:

1) plantas transgénicas que sintetizan un almidón modificado, que en sus características fisicoquímicas, en particular el contenido en amilosa o la proporción de amilosa/amilopectina, el grado de ramificación, la longitud de cadena promedio, la distribución de cadenas laterales, el comportamiento de viscosidad, la fuerza de gelificación, el tamaño de grano de almidón y/o la morfología de grano de almidón, están modificadas en comparación con el almidón sintetizado en células de plantas o plantas naturales, de forma que éste es más adecuado para aplicaciones especiales.

2) plantas transgénicas que sintetizan polímeros de hidratos de carbono distintos de almidón o que sintetizan polímeros de hidratos de carbono distintos de almidón con propiedades modificadas en comparación con plantas naturales sin modificación genética. Los ejemplos son plantas que producen polifructosa, en especial del tipo de inulina y levano, plantas que producen alfa-1,4-glucanos, plantas que producen alfa-1,4-glucanos ramificados en alfa-1,6, plantas que producen alternano,

3) plantas transgénicas que producen hialuronano.

Las plantas o variedades de cultivo (obtenidas por procedimientos de biotecnología de plantas, tales como la ingeniería genética) que también se pueden tratar de acuerdo con la invención son plantas, tales como plantas de algodón, con características de fibra modificadas. Se pueden obtener plantas de este tipo por transformación genética o por selección de plantas que contienen una mutación que confiere dichas características de fibra modificadas e incluyen:

a) plantas, tales como plantas de algodón, que contienen una forma alterada de genes de celulosasintasa,

b) plantas, tales como las plantas de algodón, que contienen una forma alterada de los ácidos nucleicos homólogos rsw2 y rsw3;

c) plantas, tales como plantas de algodón, con expresión incrementada de sacarosafosfatosintasa;

d) plantas, tales como plantas de algodón, con expresión incrementada de

sacarosasintasa;

e) plantas, tales como plantas de algodón, en las que el momento de control de paso de plasmodesmos en base a la célula de fibra está alterado, por ejemplo, por regulación por disminución de 1,3-glucanasa selectiva de fibras;

f) plantas, tales como plantas de algodón, que tienen fibras con reactividad alterada, por ejemplo por medio de la expresión del gen de N-Acetilglucosaminotransferasa, incluyendo los genes nodC, y quitinsintasa.

Las plantas o variedades de cultivo (obtenidas por procedimientos de biotecnología de plantas, tales como la ingeniería genética) que también se pueden tratar de acuerdo con la invención son plantas, tales como colza o plantas de *Brassica* relacionadas, con características modificadas de perfil de aceite. Se pueden obtener plantas de este tipo por transformación genética o por selección de plantas que contienen una mutación que confiere dichas características de aceite modificadas e incluyen:

a) plantas, tales como plantas de colza, que producen el aceite con un alto contenido en ácido oleico;

b) plantas, tales como plantas de colza, que producen el aceite con un bajo contenido en ácido linolénico;

c) plantas, tales como plantas de colza, que producen el aceite con un bajo contenido en ácidos grasos.

Son plantas transgénicas particularmente útiles que se pueden tratar de acuerdo con la invención las plantas que comprenden uno o más genes que codifican una o más toxinas, tales como las siguientes, que se comercializan bajo las marcas comerciales YIELD GARD® (por ejemplo maíz, algodón, soja), KnockOut® (por ejemplo maíz), BiteGard® (por ejemplo maíz), Bt-Xtra® (por ejemplo maíz), StarLink® (por ejemplo maíz), Bollgard® (algodón), Nucotn® (algodón), Nucotn 33B® (algodón), NatureGard® (por ejemplo maíz), Protecta® y NewLeaf® (patata). Ejemplos de plantas tolerantes a herbicidas que se pueden mencionar

son variedades de maíz, variedades de algodón y variedades de soja que se comercializan bajo las marcas comerciales Roundup Ready® (tolerancia a glifosato, por ejemplo maíz, algodón, soja), Liberty Link® (tolerancia a fosfinotricina, por ejemplo colza), IMI® (tolerancia a imidazolinonas) y STS® (tolerancia a sulfonilureas, por ejemplo maíz). Las plantas resistentes a herbicidas (plantas reproducidas de manera convencional para tolerancia a herbicidas) que se pueden mencionar incluyen las variedades comercializadas bajo la marca Clearfield® (por ejemplo maíz).

Las plantas transgénicas particularmente útiles que se pueden tratar de acuerdo con la invención son plantas que contienen acontecimientos de transformación, o combinaciones de acontecimientos de transformación, que se enumeran, por ejemplo, en las bases de datos de diversas agencias reguladoras nacionales o regionales (véanse, por ejemplo http://gmoinfo.jrc.it/gmp_browse.aspx y http://www.agbios.com/dbase.php).

En protección de material, las sustancias de la invención se pueden usar para la protección de materiales técnicos contra la infestación y destrucción por hongos y/o microorganismos no deseados.

Se entiende que los materiales técnicos que están presentes en el presente contexto son materiales inertes que se han preparado para su uso en ingeniería. Por ejemplo, los materiales técnicos que se van a proteger contra la destrucción o el cambio o microbiológico por los materiales activos de la invención pueden ser adhesivos, pegamentos, papel y cartón, textiles, alfombras, cuero, madera, pintura y artículos de plástico, lubricantes refrigeradores y otros materiales que se pueden infestar o destruir por microorganismos. Dentro del contexto de materiales que se van a proteger también están partes de plantas de producción y edificios, por ejemplo circuitos de refrigeración, sistemas de refrigeración y calefacción, sistemas de aire acondicionado y ventilación, que se pueden ver afectados adversamente por la propagación de hongos y/o microorganismos. Dentro del contexto de la presente invención, los materiales técnicos mencionados

preferentemente son adhesivos, pegamento, papel y cartón, cuero, madera, pinturas, lubricantes refrigeradores y líquidos intercambiadores de calor, la madera es particularmente preferente. Las combinaciones de acuerdo con la invención pueden evitar efectos desfavorables como descomposición, decoloración o moldeo. Las combinaciones de principios activos y composiciones de acuerdo con la invención se pueden emplear también para proteger frente a la colonización de objetos, en particular cascos de barcos, tamices, redes, edificios, muelles o instalaciones de señalización, que están en contacto con agua de mar o agua salobre.

El procedimiento de tratamiento de acuerdo con la invención también se puede usar en el campo de la protección de artículos de almacenamiento frente al ataque de hongos y microorganismos. De acuerdo con la presente invención, se entiende que el término "artículos de almacenamiento" denota sustancias naturales de origen animal o vegetal y sus formas procesadas, que se han tomado del ciclo de vida natural y para las que se desea una protección a largo plazo. Los artículos de almacenamiento de origen vegetal, tales como plantas o partes de las mismas, por ejemplo tallos, hojas, tubérculos, semillas, frutos o granos, se pueden proteger en el estado recién cosechado o en forma procesada, tal como preseca, húmeda, triturada, molida, prensada o tostada. También entra dentro de la definición de artículos de almacenamiento el leño, ya sea en forma de leño en bruto, tal como leño de construcción, torres y barreras electricidad, o bien en forma de artículos acabados, tales como muebles u objetos fabricados de madera. Los artículos de almacenamiento de origen animal son pieles, cuero, pelajes, pelos y similares. Las combinaciones de acuerdo con la presente invención pueden evitar los efectos desfavorables tales como descomposición, decoloración o moldeo. Preferentemente, se entiende que "artículos de almacenamiento" denota sustancias de origen vegetal y sus formas procesadas, más preferentemente frutos y sus formas procesadas, tales como pomos, frutos con hueso, frutos blandos y frutos cítricos y sus formas procesadas.

Algunos patógenos de enfermedades fúngicas que se pueden tratar de acuerdo con la invención se pueden mencionar a modo de ejemplo, pero no a modo de limitación:

enfermedades provocadas por patógenos de mildiu pulverulento, tales como, por ejemplo especies de Blumeria, tales como, por ejemplo Blumeria graminis; especies de Podosphaera, tales como, por ejemplo Podosphaera leucotricha; especies de Sphaerotheca, tales como, por ejemplo Sphaerotheca fuliginea; especies de Uncinula, tales como, por ejemplo Uncinula necator;

enfermedades provocadas por patógenos de la enfermedad de la roya, tales como, por ejemplo especies de Gymnosporangium, tales como, por ejemplo Gymnosporangium sabinae; especies de Hemileia, tales como, por ejemplo Hemileia vastatrix; especies de Phakopsora, tales como, por ejemplo Phakopsora pachyrhizi o Phakopsora meibomiae; especies de Puccinia, tales como, por ejemplo Puccinia recondita o Puccinia triticina; especies de Uromyces, tales como, por ejemplo Uromyces appendiculatus;

enfermedades provocadas por patógenos del grupo de los oomicetos, por ejemplo especies de Bremia, tales como, por ejemplo Bremia lactucae; especies de Peronospora, tales como, por ejemplo Peronospora pisi o P. brassicae; especies de Phytophthora, tales como, por ejemplo Phytophthora infestans; especies de Plasmopara, tales como, por ejemplo Plasmopara viticola; especies de Pseudoperonospora, tales como, por ejemplo Pseudoperonospora humuli o Pseudoperonospora cubensis; especies de Pythium, tales como, por ejemplo Pythium ultimum;

enfermedades de la mancha de la hoja y enfermedades del marchitado de la hoja provocadas, tales como, por ejemplo, por especies de Alternaria, tales como, por ejemplo Alternaria solani; especies de Cercospora, tales como, por ejemplo Cercospora beticola; especies de Cladiosporium, tales como, por ejemplo, Cladiosporium cucumerinum; especies de Cocliobolus, tales como, por ejemplo Cocliobolus sativus (forma de conidios: Drechslera, sin: Helminthosporium);

especies Colletotrichum, por ejemplo Colletotrichum lindemuthanium; especies de Cycloconium, tales como, por ejemplo Cycloconium oleaginum; especies de Diaporthe, tales como, por ejemplo Diaporthe citri; especies de Elsinoe, tales como, por ejemplo Elsinoe fawcettii; especies de Gloeosporium, tales como, por ejemplo Gloeosporium laeticolor; especies de Glomerella, tales como, por ejemplo Glomerella cingulata; especies de Guignardia, tales como, por ejemplo Guignardia bidwelli; especies de Leptosphaeria, tales como, por ejemplo Leptosphaeria maculans; especies de Magnaporthe, tales como, por ejemplo Magnaporthe grisea; especies de Microdochium, tales como, por ejemplo Microdochium nivale; especies de Mycosphaerella, tales como, por ejemplo Mycosphaerella graminicola y Mycosphaerella fijiensis; especies de Phaeosphaeria, tales como, por ejemplo Phaeosphaeria nodorum; especies de Pyrenophora, tales como, por ejemplo Pyrenophora teres; especies de Ramularia, tales como, por ejemplo Ramularia collo-cygni; especies de Rhynchosporium, tales como, por ejemplo Rhynchosporium secalis; especies de Septoria, tales como, por ejemplo Septoria apii; especies de Typhula, tales como, por ejemplo Typhula incarnata; especies de Venturia, tales como, por ejemplo Venturia inaequalis;

enfermedades de la raíz y el tallo provocadas, por ejemplo, por especies de Corticium, tales como, por ejemplo, Corticium graminaarum; especies de Fusarium, tales como, por ejemplo, Fusarium oxisporum; especies de Gaeumannomyces, tales como, por ejemplo, Gaeumannomyces graminis; especies de Rhizoctonia, tales como, por ejemplo Rhizoctonia solani; especies de Tapesia, tales como, por ejemplo, Tapesia acuformis; especies de Thielaviopsis, tales como, por ejemplo, Thielaviopsis basicola;

enfermedades de la espiga y la mazorca (incluidas mazorcas de maíz), provocadas, por ejemplo, por especies Alternaria, tales como, por ejemplo Alternaria spp.; especies de Aspergillus, tales como, por ejemplo Aspergillus flavus; especies de Cladosporium, tales como, por ejemplo Cladosporium cladosporioides; especies de Claviceps, tales como, por ejemplo Claviceps

purpurea; especies de Fusarium, tales como, por ejemplo Fusarium culmorum; especies de Gibberella, tales como, por ejemplo Gibberella zeae; especies de Monographella, tales como, por ejemplo Monographella nivalis; especies de Septoria, tales como, por ejemplo Septoria nodorum;

enfermedades provocadas por hongos del carbón, tales como, por ejemplo especies de Sphacelotheca, tales como, por ejemplo Sphacelotheca reiliana; especies de Tilletia, tales como, por ejemplo Tilletia caries o T. controversa; especies de Urocystis, tales como, por ejemplo Urocystis occulta; especies de Ustilago, tales como, por ejemplo Ustilago nuda; U. nuda tritici;

podredumbre de la fruta provocada, por ejemplo, por especies de Aspergillus, tales como, por ejemplo Aspergillus flavus; especies de Botrytis, tales como, por ejemplo Botrytis cinerea; especies de Penicillium, tales como, por ejemplo Penicillium expansum y P. purpurogenum; especies de Sclerotinia, tales como, por ejemplo Sclerotinia sclerotiorum; especies de Verticilium, tales como, por ejemplo Verticilium alboatrum;

enfermedades de podedumbre y marchitado transmitidas por las semillas y el suelo, y también enfermedades de plántulas, provocadas, por ejemplo, por especies de Fusarium species, tales como, por ejemplo, Fusarium culmorum; especies de Phytophthora, tales como, por ejemplo, Phytophthora cactorum; especies de Pythium, tales como, por ejemplo, Pythium ultimum; especies de Rhizoctonia, tales como, por ejemplo, Rhizoctonia solani; especies de Sclerotium, tales como, por ejemplo, Sclerotium rolfsii;

enfermedades cancerosas, agallas y escoba de bruja provocadas, por ejemplo, por especies de Nectria, tales como, por ejemplo, Nectria galligena;

enfermedades de marchitado provocadas, por ejemplo, por especies de Monilinia, tales como, por ejemplo Monilinia laxa;

deformaciones de hojas, flores y frutos provocadas, por ejemplo, por especies de Taphrina, tales como, por ejemplo, Taphrina deformans;

enfermedades degenerativas de plantas leñosas provocadas, por ejemplo, por

especies de Esca, tales como, por ejemplo, Phaemoniella clamydospora y Phaeoacremonium aleophilum y Fomitiporia mediterranea;

enfermedades de flores y semillas provocadas, por ejemplo, por especies de Botrytis, tales como, por ejemplo Botrytis cinerea;

enfermedades de tubérculos de plantas provocadas, por ejemplo, por especies de Rhizoctonia, tales como, por ejemplo Rhizoctonia solani; especies de Helminthosporium, tales como, por ejemplo Helminthosporium solani;

enfermedades provocadas por patógenos bacterianos, tales como, por ejemplo especies de Xanthomonas, tales como, por ejemplo, Xanthomonas campestris pv. oryzae; especies de Pseudomonas, tales como, por ejemplo, Pseudomonas syringae pv. lachrymans; especies de Erwinia, tales como, por ejemplo, Erwinia amylovora.

Se da preferencia al control de las siguientes enfermedades de la soja:

Enfermedades fúngicas en hojas, tallos, vainas y semillas, provocadas, por ejemplo por mancha foliar por alternaria (Alternaria sp. atrans tenuissima), antracnosis (Colletotrichum gloeosporoides dematium var. truncatum), mancha marrón (Septoria glycines), mancha foliar y tizón por cercospora (Cercospora kikuchii), tizón foliar por choanephora (Choanephora infundibulifera trispora (sin.)), mancha foliar por dactuliophora (Dactuliophora glycines), mildeu velloso (Peronospora manshurica), tizón por drechslera (Drechslera glycini), mancha púrpura foliar (Cercospora sojina), mancha foliar por leptosphaerulina (Leptosphaerulina trifolii), mancha foliar por phyllosticta (Phyllosticta sojaecola), tizón del tallo y la vaina (Phomopsis sojae), mildeu pulverulento (Microsphaera diffusa), mancha foliar por pirenochaeta (pirenochaeta glycines), tizón aéreo, foliar y radicular por rhizoctonia (Rhizoctonia solani), roya (Phakopsora pachyrhizi), sarna (Sphaceloma glycines), tizón foliar por stemphylium (Stemphylium botryosum), mancha anillada (Corynespora cassiicola).

Enfermedades fúngicas en raíces y la base del tallo, provocadas, por ejemplo, por podredumbre radicular negra (Calonectria crotalariae), podredumbre carbonosa

(Macrophomina phaseolina), tizón o marchitado por fusarium, podredumbre radicular, y de las vainas y del cuello (Fusarium oxisporum, Fusarium orthoceras, Fusarium semitectum, Fusarium equiseti), podredumbre radicular por mycoleptodiscus (Mycoleptodiscus terrestris), neocosmospora (Neocosmopspora vasinfecta), tizón de la vaina y del tallo (Diaporthe phaseolorum), cancro del tallo (Diaporthe phaseolorum var. caulivora), podredumbre por phyphthoftora (Phytophthora megasperma), podredumbre marrón del tallo (Phialophora gregata), podredumbre por pythium (Pythium aphanidermatum, Pythium irregulare, Pythium debaryanum, Pythium myriotilum, Pythium ultimum), podredumbre radicular por rhizoctonia, podredumbre blanda del tallo y caída de plántulas (Rhizoctonia solani), podredumbre blanda del tallo por sclerotinia (Sclerotinia sclerotiorum), tizón meridional por sclerotinia (Sclerotinia rolfsii), podredumbre radicular por thielaviopsis (Thielaviopsis basicola).

También es posible controlar cepas resistentes de los organismos mencionados anteriormente.

Los microorganismos que pueden degradar o cambiar los materiales industriales que se pueden mencionar son, por ejemplo, bacterias, hongos, levaduras, algas y mixomicetos. Los principios activos de acuerdo con la invención actúan, preferentemente, contra hongos, en particular mohos, hongos que decoloran la madera, hongos que destruyen la madera (basidiomicetos) y contra mixomicetos y algas. Se pueden mencionar microorganismos de los siguientes géneros como ejemplos: Alternaria, tal como Alternaria tenuis, Aspergillus, tal como Aspergillus niger, Chaetomium, tal como Chaetomium globosum, Coniophora, tal como Coniophora puetana, Lentinus, tal como Lentinus tigrinus, Penicillium, tal como Penicillium glaucum, Polyporus, tal como Polyporus versicolor, Aureobasidium, tal como Aureobasidium pullulans, Sclerophoma, tal como Sclerophoma pityophila, Trichoderma, tal como Trichoderma viride, Escherichia, tal como Escherichia coli, Pseudomonas, tal como Pseudomonas aeruginosa, y Staphylococcus, tal como Staphylococcus aureus.

Además, los compuestos de la fórmula (I) de acuerdo con la invención tienen también una actividad antimicótica muy buena. Tienen un espectro de actividad antimicótica muy amplia, en particular contra dermatofitos y levaduras, mohos y hongos difásicos (por ejemplo contra especies de Candida, tales como Candida albicans, Candida glabrata) y contra Epidermophyton floccosum, especies de Aspergillus, tales como Aspergillus niger y Aspergillus fumigatus, especies de Trichophyton, tales como Trichophyton mentagrophytes, especies de Microsporon, tales como Microsporon canis y audouinii. La lista de estos hongos de ningún modo limita el espectro micrótico que se puede cubrir, sino que es sólo para ilustración.

Cuando se aplican los compuestos de acuerdo con la invención, las tasas de aplicación se pueden variar dentro de un amplio intervalo. La dosis de principio activo/tasa de aplicación aplicada normalmente en el procedimiento de tratamiento de acuerdo con la invención es, de forma general y ventajosa,

- para el tratamiento de partes de plantas, por ejemplo, hojas (tratamiento foliar): de 0,1 a 10,000 g/ha, preferentemente de 10 a 1,000 g/ha, más preferentemente de 50 a 300g/ha; en caso de aplicación por empapado o goteo, la dosis incluso se puede reducir, en especial cuando se usan sustratos inertes como lana de roca o perlita;
- para el tratamiento de semillas: de 2 a 200 g por 100 kg de semillas, preferentemente de 3 a 150 g por 100 kg de semillas, más preferentemente de 2,5 a 25 g por 100 kg de semillas, aún más preferentemente de 2,5 a 12,5 g por 100 kg de semillas;
- para el tratamiento del suelo: de 0,1 a 10.000 g/ha, preferentemente de 1 a 5.000 g/ha.

Las dosis indicadas en el presente documento se dan como ejemplos ilustrativos del procedimiento de acuerdo con la invención. Un experto en la técnica sabrá cómo adaptar las dosis de aplicación, en particular de acuerdo con la naturaleza de la planta o cultivo que se va a tratar.

La combinación de acuerdo con la invención se puede usar para proteger plantas dentro de un determinado intervalo de tiempo después del tratamiento contra plagas y/u hongos fitopatógenos y/o microorganismos. El intervalo de tiempo, en el que se efectúa la protección, abarca, en general, de 1 a 28 días, preferentemente de 1 a 14 días, más preferentemente de 1 a 10 días, aún más preferentemente de 1 a 7 días después del tratamiento de las plantas con las combinaciones o hasta 200 días después del tratamiento de material de propagación de planta.

Además, también se pueden usar combinaciones y composiciones de acuerdo con la invención para reducir el contenido en micotoxinas en plantas y el material de planta cosechado y por lo tanto, en alimentos y piensos animales fabricados a partir de estos. En especial pero no exclusivamente, se pueden especificar las siguientes micotoxinas: Desoxinivalenola (DON), Nivalenola, 15-Ac-DON, 3-Ac-DON, toxinas T2 y HT2, Fumonisinas, Zearalenona Moniliformina, Fusarina, Diaceotoxiscirpenola (DAS), Beauvericina, Enniatina, Fusaroproliferina, Fusarenola, Ocratoxinas, Patulina, Ergotalcaloides y Aflatoxinas, que se provocan por las siguientes enfermedades fúngicas: *especies de Fusarium spec.*, como *Fusarium acuminatum, F. avenaceum, F. crookwellense, F. culmorum, F. graminaarum (Gibberella zeae), F. equiseti, F. fujikoroi, F. musarum, F. oxisporum, F. proliferatum, F. poae, F. pseudograminaarum, F. sambucinum, F. scirpi, F. semitectum, F. solani, F. sporotrichoides, F. langsetiae, F. subglutinans, F. tricinctum, F. verticillioides* y otras peso también por especies de *Aspergillus*, especies de *Penicillium*, C*laviceps purpurea, especies de Stachybotrys* y otras.

La buena actividad fungicida de las combinaciones de principios activos de acuerdo con la invención es evidente a partir del ejemplo a continuación. Aunque los principios activos individuales presentan debilidad con respecto a la actividad fungicida, las combinaciones tienen una actividad que excede a una simple adición de actividades.

Siempre está presente un efecto sinérgico de los fungicidas cuando la actividad fungicida de las combinaciones de principios activos excede el total de las

actividades de los principios activos cuando se aplican individualmente.

La actividad esperada para una combinación dada de dos principios activos se puede calcular como sigue (véase, Colby, S.R., "Calculating Synergistic and Antagonistic Responses of Herbicide Combinations", *Weeds* **1967**, *15*, 20-22):

Si

X es la eficacia cuando se aplica el principio activo A en una tasa de aplicación de m ppm (o g/ha),

Y es la eficacia cuando se aplica el principio activo B en una tasa de aplicación de n ppm (o g/ha),

E es la eficacia cuando se aplican los principios activos A y B en tasas de aplicación de m y n ppm (o g/ha), respectivamente, y

entonces $E = X + Y - \frac{X \cdot Y}{100}$

Se denota el grado de eficacia, expresado en %. Un 0 % significa una eficacia que corresponde a la del control, mientras que una eficacia del 100 % significa que no se observa ninguna enfermedad.

Si la actividad fungicida actual excede del valor calculado, entonces la actividad de la combinación es superaditiva, es decir, existe un efecto sinérgico. En este caso, la eficacia que se observó en realidad debe ser mayor que el valor para la eficacia esperada (E) calculada a partir de la fórmula mencionada anteriormente.

Otra forma de demostrar un efecto sinérgico es el procedimiento de Tammes (véase, "Isoboles, a graphic representation of synergism en pesticides" en *Net. J. Plant Path.*, **1964**, *70*, 73-80).

La invención se ilustra por los ejemplos a continuación. Sin embargo, la invención no está limitada a los ejemplos.

Ejemplos

2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[2,6-difluoro-4-(prop-2-en-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona (I-4)

4-{4-[5-(2,6-difluoro-4-hidroxifenil)-4,5-dihidro-1,2-oxazol-3-il]-1,3-tiazol-2-il}piperidin-1-carboxilato de *terc*-butilo

A una solución de 4-{4-[(Z/E)-(hidroxiimino)metil]-1,3-tiazol-2-il}piperidina-1-carboxilato de terc-butilo (1,75 g) y 3,5-difluoro-4-vinilfenol (1,05 g) en acetato de etilo (45 ml) se añadieron, a temperatura ambiente, bicarbonato de potasio (2,81 g) y N-clorosuccinimida (0,90 g) y después una gota de agua. Se agitó la mezcla de reacción a 60 °C durante 4 horas, después se mezcló con acetato de etilo y agua y se extrajo con acetato de etilo. Los extractos orgánicos se secaron sobre sulfato de sodio y se concentraron a presión reducida. El residuo se purificó mediante cromatografía. Esto proporcionó 4-{4-[5-(2,6-difluoro-4-hidroxifenil)-4,5-dihidro-1,2-oxazol-3-il]-1,3-tiazol-2-il}piperidin-1-carboxilato de *terc*-butilo (0,62 g).

RMN de ^{1}H (DMSO-d_6, 400 MHz): $_{ppm}$: 1,41 (s, 9H), 1,48-1,62 (m, 2H), 1,98-2,08 (m, 2H), 2,81-2,96 (m, 2H), 3,45 (dd, 1H), 3,80 (dd, 1H), 3,96-4,06 (m, 2H), 5,87 (dd, 1H), 6,50 (m, 2H), 7,98 (s, 1H), 10,50 (s, 1H)

logP (HCOOH): 3,24

EM (ESI): 366 ($[M-C(CH3)_3OCO+H]^+$)

Cloruro de 4-{4-[5-(2,6-difluoro-4-hidroxifenil)-4,5-dihidro-1,2-oxazol-3-il]-1,3-tiazol-2-il}piperidinio

A una solución de 4-{4-[5-(2,6-difluoro-4-hidroxifenil)-4,5-dihidro-1,2-oxazol-3-il]-1,3-tiazol-2-il}piperidin-1-carboxilat de *terc*-butilo (620 mg) en diclorometano (4 ml) se le añadió gota a gota, a 0 °C, una solución 4 molar de cloruro de hidrógeno en 1,4-dioxano (8,5 ml). La mezcla de reacción se agitó a 0 °C y después se calentó gradualmente a temperatura ambiente. Después de agitar durante 3 h a temperatura ambiente, se retiraron el disolvente y el cloruro de hidrógeno en exceso. Esto proporcionó cloruro de 4-{4-[5-(2,6-difluoro-4-hidroxifenil)-4,5-dihidro-1,2-oxazol-3-il]-1,3-tiazol-2-il}piperidinio (492 mg)

RMN de ^{1}H (DMSO-d_6, 400 MHz): $_{ppm}$: 1,41 (s, 9H), 1,48-1,62 (m, 2H), 1,98-2,08 (m, 2H), 2,81-2,96 (m, 2H), 3,45 (dd, 1H), 3,80 (dd, 1H), 3,96-4,06 (m, 2H), 5,87 (dd, 1H), 6,50 (m, 2H), 7,98 (s, 1H), 10,50 (s, 1H)

logP (HCOOH): 0,98

EM (ESI): 366 ($[M-Cl+H]^+$)

2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-(4-{4-[5-(2,6-difluoro-4-hidroxifenil)-4,5-dihidro-1,2-oxazol-3-il]-1,3-tiazol-2-il}piperidin-1-il)etanona

Solución A: A una solución de ácido [3,5-bis(difluorometil)-1H-pirazol-1-il]acético (305 mg) en diclorometano (10 ml) se le añadieron gota a gota, a temperatura ambiente, una gota de N,N-dimetilformamida y cloruro de oxalilo (0,320 ml). Después de agitar a temperatura ambiente durante dos horas, se retiró el disolvente y se disolvió de nuevo el residuo en diclorometano (5 ml) (solución A).

A una solución de cloruro de 4-{4-[5-(2,6-difluoro-4-hidroxifenil)-4,5-dihidro-1,2-oxazol-3-il]-1,3-tiazol-2-il}piperidinio (492 mg) en diclorometano (14 ml) se le añadió, a temperatura ambiente, trietilamina (1,7 ml). Después de 15 minutos, se añadió la solución A gota a gota. Después de agitar a temperatura ambiente durante la noche, se mezcló la mezcla de reacción con agua y se extrajo con acetato de etilo. Se secaron los extractos orgánicos sobre sulfato de sodio y se concentraron a presión reducida. Se purificó el residuo por cromatografía. Esto proporcionó 2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-(4-{4-[5-(2,6-difluoro-4-hidroxifenil)-4,5-dihidro-1,2-oxazol-3-il]-1,3-tiazol-2-il}piperidin-1-il)etanona (360 mg).

RMN de ^{1}H (DMSO-d_6, 400 MHz): $_{ppm}$: 1,51-1,61 (m, 1H), 1,77-1,85 (m, 1H), 2,06-2,17 (m, 2H), 2,79-2,87 (m, 1H), 3,23-3,31 (m, 1H), 3,46 (dd, 1H), 3,81 (dd, 1H), 3,93-4,00 (m, 1H), 4,31-4,39 (m, 1H), 5,32-5,48 (m, 2H), 5,88 (dd, 1H), 6,49 (m, 2H), 6,91 (s, 1H), 7,04 (t, 1H), 7,18 (t, 1H), 8,01 (s, 1H), 10,72 (s, 1H)

logP (HCOOH): 2,58

EM (ESI): 574 ($[M+H]^+$)

2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[2,6-difluoro-4-(prop-2-en-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona

A una solución de 2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-(4-{4-[5-(2,6-difluoro-4-hidroxifenil)-4,5-dihidro-1,2-oxazol-3-il]-1,3-tiazol-2-il}piperidin-1-il)etanona (384 mg) y carbonato de potasio (138 mg) en N,N-dimetilformamida (18 ml) se le añadieron, a temperatura ambiente, yoduro de potasio (61 mg) y 3-bromoprop-1-

ino (127 mg) . Se agita la mezcla de reacción a 80 °C durante 9 h. A continuación se mezcla la mezcla con ácido clorhídrico diluido y se extrae con acetato de etilo. Se secan las fases orgánicas combinadas sobre sulfato de sodio y se concentran. La purificación por cromatografía en columna proporciona 2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[2,6-difluoro-4-(prop-2-en-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona (60 mg).

RMN de ^{1}H (DMSO-d_6, 400 MHz): $_{ppm}$: 1,51-1,65 (m, 1H), 1,74-1,88 (m, 1H), 2,05-2,19 (m, 2H), 2,80-2,91 (m, 1H), 3,50 (dd, 1H), 3,65 (t, 1H), 3,85 (dd, 1H), 3,93-4,03 (m, 1H), 4,31-4,41 (m, 1H), 4,88 (d, 2H), 5,31-5,48 (m, 2H), 5,92 (dd, 1H), 6,85 (m, 2H), 6,90 (s, 1H), 7,02 (t, 1H), 7,18 (t, 1H), 8,02 (s, 1H)

logP (HCOOH): 3,30

EM (ESI): 612 ($[M+H]^+$)

2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[2,6-difluoro-3-(prop-2-en-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona (I-7)

4-{4-[5-(2,6-difluoro-3-hidroxifenil)-4,5-dihidro-1,2-oxazol-3-il]-1,3-tiazol-2-il}piperidin-1-carboxilato de terc-butilo

A una solución de 4-{4-[(hidroxiimino)metil]-1,3-tiazol-2-il}piperidin-1-carboxilato de *terc*-butilo (1,278 g) en acetato de etilo (80 ml) se le añadió, a temperatura ambiente, N-clorosuccinimida (658 mg). Después de agitar a 60 °C durante 30 min, se añadieron 2,4-difluoro-3-vinilfenol (705 mg), hidrogenocarbonato de potasio (822 mg) y después una gota de agua, a temperatura ambiente, a la mezcla de reacción. Después de agitar durante la noche a temperatura ambiente, se mezcló la mezcla de reacción con acetato de etilo y se extrajo con acetato de etilo. Se secaron los extractos orgánicos sobre sulfato de sodio y se concentraron a presión reducida. Se purificó el residuo por cromatografía. Esto proporcionó 4-{4-[5-(2,6-difluoro-3-hidroxifenil)-4,5-dihidro-1,2-oxazol-3-il]-1,3-tiazol-2-yl}piperidin-1-carboxilato de terc-butilo (658 mg).

RMN de ^{1}H (DMSO-d_6, 400 MHz): $_{ppm}$: 9,92 (s, 1H), 8,01 (s, 1H), 7,04-6,90 (m, 2H), 5,96 (dd, 1H), 4,01 (bd, 2H), 3,94-3,84 (m, 1H), 3,50 (dd, 1H), 2,10-2,00 (m,

2H), 1,63-1,50 (m, 2H), 1,42 (s, 9H)

2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-(4-{4-[5-(2,6-difluoro-3-hidroxifenil)-4,5-dihidro-1,2-oxazol-3-il]-1,3-tiazol-2-il}piperidin-1-il)etanona

A una solución de 4-{4-[5-(2,6-difluoro-3-hidroxifenil)-4,5-dihidro-1,2-oxazol-3-il]-1,3-tiazol-2-il}piperidin-1-carboxilato de terc-butilo (3,92 g) en diclorometano (15 ml) se le añadió gota a gota, a 0 °C, una solución 4 molar de cloruro de hidrógeno (10 eq.) en 1,4-dioxano. Se agitó la mezcla de reacción a 0 °C y después se calentó gradualmente a temperatura ambiente. Después de agitar durante 5 horas, se retiraron el disolvente y el cloruro de hidrógeno en exceso. Esto proporcionó cloruro de 4-{4-[5-(2,6-difluoro-3-hidroxifenil)-4,5-dihidro-1,2-oxazol-3-il]-1,3-tiazol-2-il}piperidinio. (compuesto A)

A una solución de ácido [3,5-bis-(difluorometil)-1H-pirazol-1-il]acético (2 g) en diclorometano (40 ml) se añaden, a 0 °C, cloruro de oxalilo (3.273 g) y una gota de N,N-dimetilformamida. Se agita la mezcla de reacción a temperatura ambiente durante 2 horas. Se retiran el disolvente y el exceso de reactivo a presión reducida. Se disuelve de nuevo el residuo sólido en diclorometano (15 ml) y, a 0 °C, se añade gota a gota una solución de cloruro de 4-{4-[5-(2,6-difluoro-3-hidroxifenil)-4,5-dihidro-1,2-oxazol-3-il]-1,3-tiazol-2-il}piperidinio (compuesto A) y trietilamina (5,0 eq.) en diclorometano (100 ml). La mezcla de reacción se agita a temperatura ambiente durante la noche. Después, se mezcla con solución concentrada de hidrogenocarbonato de sodio, y se retira la fase acuosa y se extrae con acetato de etilo. Se secan las fases orgánicas combinadas sobre sulfato de sodio y se concentran. La purificación por cromatografía en columna proporciona 2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-(4-{4-[5-(2,6-difluoro-3-hidroxifenil)-4,5-dihidro-1,2-oxazol-3-il]-1,3-tiazol-2-il}piperidin-1-il)etanona (1,818 g).

RMN de ^{1}H (DMSO-d_6, 400 MHz): $_{ppm}$: 9,91 (s, 1H), 8,03 (s, 1H), 7,18 (t, 1H), 7,03 (t, 1H), 7,02-6,88 (m, 3H), 5,96 (dd, 1H), 5,40 (q, 2H), 4,36 (bd, 1H), 4,02-3,84 (m, 2H), 3,55 (dd, 1H), 3,45-3,22 (m, 2H), 2,84 (t, 1H), 2,11 (t, 2H), 1,88-1,75 (m, 1H),

1,65-1,50 (m, 1H)

logP (HCOOH): 2,61

2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[2,6-difluoro-3-(prop-2-en-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona,

A una solución de 2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-(4-{4-[5-(2,6-difluoro-3-hidroxifenil)-4,5-dihidro-1,2-oxazol-3-il]-1,3-tiazol-2-il}piperidin-1-il)etanona (1,82 g) y carbonato de potasio (657 mg) en N,N-dimetilformamida (15 ml) se le añaden a temperatura ambiente, yoduro de potasio (289 mg) y 3-bromoprop-1-ino (755 mg)) (80 % en peso en tolueno). Se agita la mezcla de reacción a 80 °C durante 4 h. Después, se mezcla la mezcla con solución acuosa saturada en cloruro de amonio y se extrae con acetato de etilo. Se secan las fases orgánicas combinadas sobre sulfato de sodio y se concentran. La purificación por cromatografía en columna proporciona 2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[2,6-difluoro-3-(prop-2-en-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona, (1,68 g).

RMN de ^{1}H (DMSO-d_6, 400 MHz): $_{ppm}$: 8,03 (s, 1H), 7,46-7,26 (m, 1H), 7,18 (t, 1H), 7,20-7,08 (m, 1H), 7,03 (t, 1H), 6,91 (s, 1H), 5,99 (dd, 1H), 5,40 (q, 2H), 4,89 (d, 2H), 4,35 (bs, 1H), 4,06-3,85 (m, 2H), 3,64 (t, 1H), 3,54 (dd, 1H), 3,46-3,21 (m, 2H), 2,84 (t, 1H), 2,12 (t, 2H), 1,89-1,75 (m, 1H), 1,65-1,50 (m, 1H).

logP (HCOOH): 3,17

Los siguientes ejemplos se pueden sintetizar en consecuencia:

(I-1) 2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[2-(prop-2-en-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona log p: 3,24[b]; 3,34[c]

(I-2) 2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[4-(prop-2-en-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona log p: 3,08[b]; 3,14[c]

(I-3) 2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[3-(prop-2-en-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona log p: 3,16[b];

3,24[c]

(I-5) 2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[2-fluoro-6-(prop-2-en-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona log p: 3,15[b]; 3,18[c]

(I-6) 2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[2-cloro-6-(prop-2-en-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona log p: 3,51[a]; 3,4[b]

(I-8) 2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[5-fluoro-2-(prop-2-en-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona log p: 3,37[b]; 3,44[c]

(I-9) 2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[4-metoxi-2-(prop-2-en-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona log p: 3,25[b]; 3,2[c]

(I-10) 2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[3-fluoro-2-(prop-2-en-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona log p: 3,37[b]; 3,48[c]

Se realizó la medida de los valores de logP de acuerdo con la directiva EEC 79/831 Annex V.A8 por HPLC (cromatografía de líquido de alta resolución) em columnas de fase inversa con los siguientes procedimientos:

[a] Se realizó la medida a pH 2,3 con á fosfórico al 0,1% y acetonitrilo como eluyente.

[b] se realizó la medida de CL-EM a pH 2,7 con ácido fórmico al 0,1 % en agua y con acetonitrilo (contiene ácido fórmico al 0,1%) como eluyente con un gradiente lineal de acetonitrilo al 10 % hasta acetonitrilo al 95 %.

[c] se realizó la medida con LC-EM a pH 7,8 con solución de hidrógenocarbonato de amonio 0,001 molar en agua como eluyente con un gradiente lineal de acetonitrilo al 10 % a acetonitrilo al 95 %.

Se realizó la calibración usando alcan-2-onas no ramificadas (con de 3 a 16 átomos de carbono) con valores de logP conocidos (medida de valores de logP

usando tiempos de retención con interpolación lineal entre alcanonas sucesivas). Se determinaron los valores de lambda-maX usando espectros UV de 200 nm a 400 nm y los valores pico de las señales cromatográficas.

Listas de picos de RMN

Se dan los datos de RMN de 1H de los ejemplos seleccionados en forma de listas de picos de RMN de 1H. Para cada pico de señal se enumeran el valor □ en ppm y la intensidad de señal con espacio como delimitador. Entre los pares de valor □ – intensidad de señal hay semicolumnas como delimitadores.

La lista de picos de un ejemplo tiene, por tanto, la forma:

δ_1 intensidad$_1$;δ_2 intensidad$_2$;.....;δ_i intensidad$_i$;.....; δ_n intensidad$_n$

El disolvente en el que se midió el espectro de RMN está escrito en corchetes cuadrados después del número de ejemplo y antes de la lista de picos de RMN

Ejemplo n.º I-1 [DMSO-D_6] 8,0055 16,00;7,3472 1,39;7,3429 1,89;7,3238 8,76;7,3048 10,15;7,1707 5,98;7,1567 3,82;7,1514 4,37;7,1317 3,60;7,0375 2,99;7,0210 8,97;7,0035 4,27;6,9848 2,03;6,8977 5,49;6,8852 3,32;5,8869 2,12;5,8691 2,50;5,8594 2,52;5,8413 2,24;5,4480 1,14;5,4048 4,22;5,3631 4,23;5,3208 1,12;4,8765 12,42;4,8706 12,41;4,3586 1,31;4,3257 1,38;3,9762 1,35;3,9425 1,47;3,8964 2,48;3,8686 2,86;3,8534 3,19;3,8257 2,87;3,7713 0,39;3,7658 0,37;3,7408 0,35;3,7236 0,39;3,6946 0,41;3,6901 0,44;3,6139 0,50;3,6009 0,57;3,5655 3,69;3,5596 7,65;3,5537 3,68;3,5269 0,74;3,5095 0,83;3,4837 1,00;3,4673 1,14;3,4479 1,33;3,4029 3,19;3,3743 6,16;3,3121 5148,85;3,2885 58,37;3,2715 8,09;3,2534 5,49;3,2284 4,06;3,2105 3,16;3,1748 0,37;2,8624 0,95;2,8325 1,66;2,8060 1,01;2,6952 0,56;2,6787 1,83;2,6741 3,46;2,6695 4,52;2,6649 3,37;2,6603 1,74;2,6277 0,54;2,5395 5,91;2,5227 18,48;2,5094 256,55;2,5050 482,43;2,5005 633,82;2,4960 435,65;2,4916 205,46;2,3364 1,51;2,3317 3,16;2,3272 4,18;2,3225 3,02;2,3179 1,43;2,1278 1,15;2,0948 2,38;2,0688 10,42;1,9078 0,32;1,8353 0,55;1,8047 1,09;1,7818 0,95;1,7727 0,92;1,7518 0,40;1,7445 0,38;1,5999

0,49;1,5800 1,01;1,5699 1,05;1,5486 1,04;1,5398 1,01;1,5191 0,45;1,2356 0,80;0,8904 0,61;0,0080 2,38;-0,0002 56,69;-0,0084 2,00
Ejemplo n.º I-2 [DMSO-D_6] 9,9022 0,44;8,7772 0,50;8,6463 0,42;8,0130 16,00;7,7728 0,64;7,7581 0,33;7,7407 0,50;7,5929 0,52;7,3484 9,21;7,3313 4,39;7,3267 10,28;7,3088 3,30;7,2042 0,38;7,1754 7,08;7,1595 3,59;7,0421 3,74;7,0234 8,65;7,0126 11,26;7,0076 4,29;6,9955 3,95;6,9907 9,69;6,9573 0,62;6,9001 7,60;6,8876 4,10;5,7464 13,29;5,6954 2,45;5,6739 3,26;5,6688 2,96;5,6472 2,43;5,4524 1,52;5,4104 5,36;5,3688 5,44;5,3262 1,43;4,8008 14,95;4,7949 14,86;4,7407 0,94;4,3647 1,74;4,3317 1,80;4,0571 0,80;4,0392 2,27;4,0214 2,32;4,0037 1,21;3,9850 1,69;3,9517 1,80;3,8530 2,59;3,8260 2,95;3,8100 3,38;3,7831 2,88;3,5499 3,63;3,5440 7,26;3,5382 3,57;3,4766 0,33;3,4424 0,49;3,4165 1,72;3,4070 1,58;3,3895 5,58;3,3785 2,68;3,3685 4,75;3,3595 2,82;3,3469 4,70;3,3252 7,94;3,3047 416,16;3,2810 7,73;3,2426 1,41;3,0372 0,33;2,8752 1,34;2,8491 2,27;2,8170 1,23;2,6737 0,74;2,6693 1,21;2,6648 0,70;2,5390 1,68;2,5087 48,88;2,5045 86,78;2,5000 110,03;2,4957 76,72;2,3313 0,55;2,3268 0,72;2,3222 0,49;2,1375 1,59;2,1049 3,18;2,0691 2,49;1,9868 9,24;1,9080 0,66;1,8444 0,72;1,8229 1,38;1,8154 1,43;1,7920 1,34;1,7626 0,56;1,6213 0,60;1,6144 0,71;1,5938 1,36;1,5841 1,46;1,5630 1,36;1,5542 1,28;1,5340 0,60;1,2366 0,62;1,1927 2,59;1,1749 5,02;1,1571 2,49;-0,0002 5,18
Ejemplo n.º I-3 [DMSO-D_6] 8,0183 1,38;7,3327 0,53;7,1725 0,58;7,0218 0,70;7,0082 0,35;6,9906 0,80;6,8999 0,59;6,8859 0,33;5,7441 7,03;5,4070 0,43;5,3656 0,46;4,8067 1,20;4,8008 1,20;4,3506 0,38;4,3380 0,69;4,3252 0,44;4,0903 0,34;4,0772 0,36;4,0572 1,22;4,0394 3,66;4,0216 3,70;4,0038 1,27;3,5397 0,39;3,5338 0,72;3,5281 0,38;3,4750 0,33;3,4622 0,37;3,4575 0,64;3,4448 0,70;3,4401 0,74;3,4273 0,79;3,4226 0,61;3,4098 0,68;3,3964 1,04;3,3757 1,59;3,3299 662,84;3,3068 6,66;3,1773 1,22;3,1642 1,18;2,6708 0,41;2,5408 0,57;2,5240 1,51;2,5106 21,47;2,5063 40,33;2,5018 52,87;2,4974 36,58;2,4930 17,42;2,4636 0,33;2,4454 0,49;2,4280 0,46;2,3285 0,36;2,0685

0,90;1,9869 16,00;1,1930 4,40;1,1752 8,70;1,1574 4,29;1,0748 0,93;1,0572 1,77;1,0398 0,88;0,9521 1,12;0,9343 2,20;0,9165 1,07;-0,0002 0,67
Ejemplo n.º I-5 [DMSO-D_6] 7,9681 16,00;7,4330 1,50;7,4160 1,98;7,4119 3,10;7,3952 3,13;7,3910 1,89;7,3739 1,51;7,3085 2,56;7,1750 5,80;7,1585 2,74;7,0418 2,83;7,0226 6,92;7,0121 4,36;6,9908 3,84;6,9093 3,01;6,9008 5,87;6,8865 5,33;6,8644 1,87;6,0740 1,94;6,0516 2,36;6,0436 2,19;6,0213 1,96;5,4545 1,14;5,4110 4,19;5,3690 4,16;5,3271 1,09;4,8870 0,53;4,8816 0,59;4,8472 6,66;4,8417 10,99;4,8361 6,08;4,8020 0,48;4,7962 0,58;4,3673 1,31;4,3338 1,42;3,9904 1,39;3,9536 1,47;3,8311 0,43;3,8095 1,58;3,7769 1,77;3,7681 2,13;3,7375 1,93;3,5278 3,35;3,5207 4,59;3,5148 8,43;3,5088 5,00;3,4848 3,01;3,4631 3,39;3,3942 7,50;3,3307 5101,71;3,3077 39,28;3,2505 2,33;3,2140 0,93;3,1513 0,33;2,8803 0,83;2,8505 1,57;2,8219 0,84;2,6753 1,19;2,6708 1,61;2,6661 1,17;2,6613 0,59;2,5407 2,04;2,5107 94,07;2,5063 176,46;2,5017 231,85;2,4973 160,85;2,4929 77,91;2,3331 1,24;2,3283 1,57;2,1548 1,15;2,1171 2,28;2,0796 1,44;2,0684 11,58;1,8497 0,53;1,8211 1,07;1,7995 1,06;1,6243 0,49;1,5944 1,06;1,5722 1,05;1,5414 0,42;1,2375 0,37;-0,0002 12,57
Ejemplo n.º I-6 [DMSO-D_6] 7,9699 10,61;7,4071 2,41;7,3934 4,66;7,3796 3,07;7,2752 1,62;7,1866 3,78;7,1592 4,04;7,1538 4,69;7,1452 3,55;7,1404 4,18;7,1317 1,81;7,0981 1,82;7,0412 4,24;6,9510 1,99;6,9167 4,54;6,2241 1,96;6,2077 2,40;6,2036 2,22;6,1871 1,98;5,7656 16,00;5,4603 1,61;5,4319 3,45;5,3819 3,39;5,3536 1,59;4,8286 0,82;4,8247 0,79;4,8020 3,81;4,7981 3,85;4,7899 3,79;4,7861 3,61;4,7633 0,81;4,7594 0,80;4,3670 1,08;4,3451 1,11;4,0452 0,51;4,0334 1,53;4,0215 1,55;4,0097 0,53;3,9852 1,04;3,9628 1,11;3,7541 1,50;3,7334 1,91;3,7262 2,29;3,7056 1,88;3,5693 2,07;3,5530 2,10;3,5414 1,63;3,5251 1,59;3,4631 2,42;3,4592 4,73;3,4554 2,22;3,4198 0,46;3,4137 0,81;3,4074 0,57;3,4008 0,99;3,3946 1,65;3,3883 1,06;3,3754 1,57;3,3523 274,08;3,3299 1,08;3,2952 0,77;3,2912 0,87;3,2716 1,51;3,2523 0,85;3,2486 0,70;2,8618 0,76;2,8431 1,38;2,8236 0,77;2,6180 0,64;2,6151

0,84;2,6121 0,61;2,5428 0,39;2,5241 2,50;2,5211 3,45;2,5062 103,50;2,5033 133,72;2,5004 96,81;2,3904 0,69;2,3875 0,88;2,3846 0,64;2,1497 0,99;2,1296 1,16;2,1078 1,06;2,0877 1,09;2,0787 0,92;1,9906 6,59;1,8398 0,37;1,8207 0,88;1,8017 0,83;1,6093 0,33;1,6029 0,39;1,5892 0,87;1,5828 0,90;1,5688 0,88;1,5627 0,83;1,5490 0,35;1,1858 1,79;1,1740 3,53;1,1622 1,75;0,0051 0,44;-0,0002 8,35
Ejemplo n.º I-8 [DMSO-D_6] 8,2694 0,37;8,0297 16,00;7,9423 0,34;7,3091 2,84;7,1813 6,20;7,1772 11,27;7,1662 10,80;7,1624 8,45;7,0958 2,91;7,0732 3,19;7,0426 3,23;7,0294 7,49;6,9051 6,34;6,8935 3,90;5,8645 2,29;5,8471 2,58;5,8369 2,65;5,8193 2,37;5,4555 1,50;5,4132 5,05;5,3703 4,97;5,3273 1,58;4,8808 13,15;4,8749 13,81;4,3601 1,47;4,3275 1,57;3,9771 1,37;3,9407 1,52;3,9294 2,96;3,9015 2,87;3,8861 3,23;3,8584 2,64;3,6039 2,94;3,5981 6,75;3,5921 3,20;3,4144 0,70;3,4048 1,16;3,3952 0,96;3,3853 1,40;3,3759 2,57;3,3666 1,96;3,3337 316,84;3,3303 523,70;3,3286 460,30;3,3252 593,19;3,2919 6,64;3,2742 4,45;3,2582 2,69;3,2487 4,11;3,2310 4,04;3,1993 0,56;3,1490 0,35;3,1246 0,33;2,8581 1,12;2,8268 1,93;2,7999 1,08;2,6796 0,53;2,6753 1,26;2,6707 1,76;2,6660 1,35;2,5409 1,12;2,5240 3,16;2,5106 90,30;2,5061 191,47;2,5015 264,57;2,4969 200,78;2,4925 103,79;2,3329 1,42;2,3283 1,93;2,3238 1,50;2,1244 1,34;2,0912 2,76;2,0736 13,65;2,0591 1,66;1,8417 0,52;1,8317 0,61;1,8123 1,21;1,8025 1,29;1,7812 1,18;1,7728 1,17;1,7501 0,51;1,6054 0,50;1,5955 0,62;1,5739 1,21;1,5645 1,36;1,5442 1,21;1,5343 1,19;1,5136 0,52;1,5038 0,44;1,2353 0,90;0,1460 0,45;0,0081 3,18;-0,0002 106,36;-0,0084 5,20;-0,1499 0,45
Ejemplo n.º I-9 [DMSO-D_6] 9,7648 0,40;7,9977 5,78;7,9717 0,36;7,3105 1,24;7,2239 2,35;7,2028 2,50;7,1771 2,83;7,1657 1,46;7,0442 1,45;7,0299 3,16;6,9057 3,58;6,8943 1,72;6,7107 2,56;6,7047 2,70;6,5880 1,61;6,5824 1,35;6,5667 1,43;6,5612 1,25;5,8121 0,94;5,7933 1,12;5,7844 1,16;5,7656 1,11;5,4587 0,72;5,4144 2,49;5,3719 2,50;5,3292 0,88;4,8596 4,64;4,8539 4,69;4,3610 0,80;4,3280 0,83;4,0557 0,50;4,0382 1,43;4,0203 1,50;4,0018

0,54;3,9815 0,81;3,9460 0,83;3,8409 0,48;3,8294 0,40;3,8150 0,97;3,7878 1,26;3,7721 1,29;3,7534 16,00;3,6856 1,58;3,5763 1,35;3,5708 2,96;3,4146 0,49;3,4061 0,72;3,3766 1,59;3,3657 1,55;3,3367 262,16;3,3302 692,11;3,2913 1,36;3,2802 1,61;3,2608 2,29;3,2369 1,33;3,2187 1,11;2,8610 0,54;2,8343 1,02;2,8008 0,58;2,7985 0,47;2,6712 1,05;2,5415 0,45;2,5018 180,11;2,3285 1,07;2,1308 0,74;2,0978 1,42;2,0732 1,60;2,0602 0,78;1,9885 5,87;1,8153 0,67;1,8089 0,69;1,7838 0,61;1,7769 0,59;1,5781 0,62;1,5699 0,66;1,5476 0,66;1,5404 0,57;1,3973 0,52;1,2589 0,38;1,2367 0,91;1,1923 1,51;1,1746 2,97;1,1568 1,53;0,8684 0,36;0,8490 0,45;0,8303 0,33;-0,0002 10,43
Ejemplo n.º I-10 [DMSO-D_6] 8,8000 0,35;8,0314 16,00;8,0258 0,56;7,3002 1,37;7,2954 1,51;7,2887 1,57;7,2839 2,00;7,2810 1,63;7,2724 3,50;7,2647 1,91;7,2587 0,45;7,1955 0,88;7,1824 8,23;7,1755 8,85;7,1706 6,38;7,1683 4,98;7,1624 1,02;7,1294 2,47;7,0939 2,49;7,0390 6,09;6,9487 2,81;6,9145 5,99;5,9825 2,63;5,9702 2,96;5,9639 2,84;5,9516 2,64;5,4543 2,00;5,4259 4,37;5,3764 4,54;5,3480 2,07;4,8469 12,91;4,8429 12,80;4,3581 1,42;4,3361 1,43;4,0454 0,68;4,0335 1,99;4,0217 2,00;4,0099 0,69;3,9754 1,36;3,9469 3,25;3,9281 2,81;3,9181 2,98;3,8995 2,46;3,6563 3,62;3,6524 7,40;3,6484 3,44;3,4078 1,31;3,4019 1,98;3,3887 2,94;3,3825 4,59;3,3761 5,15;3,3509 1174,43;3,3311 6,48;3,3273 18,77;3,3192 3,56;3,3068 0,53;3,2844 1,13;3,2807 1,28;3,2611 2,01;3,2418 1,16;3,1708 0,76;3,1622 0,74;2,8500 1,05;2,8299 1,79;2,8120 1,06;2,6180 1,96;2,6150 2,59;2,6120 1,91;2,6091 0,99;2,5427 2,69;2,5242 8,11;2,5211 10,12;2,5179 11,89;2,5091 139,51;2,5062 280,13;2,5032 371,18;2,5002 269,11;2,4973 124,42;2,3933 0,95;2,3904 1,85;2,3874 2,43;2,3844 1,74;2,1262 1,29;2,1054 1,53;2,0868 1,43;2,0782 5,17;2,0671 1,39;1,9905 8,79;1,8320 0,51;1,8253 0,60;1,8114 1,17;1,8053 1,27;1,7905 1,21;1,7847 1,11;1,7707 0,52;1,7643 0,41;1,5910 0,47;1,5847 0,57;1,5708 1,17;1,5644 1,23;1,5504 1,20;1,5442 1,11;1,5301 0,49;1,5239 0,41;1,3969 3,62;1,2337 1,97;1,1860 2,41;1,1741 4,71;1,1623

2,36;0,8535 0,32;0,0966 0,33;0,0052 3,55;-0,0002 79,84;-0,0057 2,64

Procedimiento de lista de picos de RMN, detalles adicionales

Se encuentran detalles adicionales de la descripción de los datos de RMN en la publicación " Citation de NMR Peaklist Data within Patent Applications":

http://www.rdelectronic.co.uk/rd/free/RD564025.pdf

Ejemplos biológicos

Prueba de Phytophthora (tomates) / preventiva

Disolvente: 24,5 partes en peso de acetona

24,5 partes en peso de dimetilacetamida

Emulsionante: 1 parte en peso de éter alquilaril poliglicólico

Para producir una preparación adecuada del principio activo, se mezcla 1 parte en peso del principio activo con las cantidades establecidas de disolvente y emulsionante, y se diluye el concentrado con agua hasta la concentración deseada.

Para someter a prueba la actividad preventiva, se pulverizan plantas jóvenes con la preparación del principio activo en la tasa de aplicación establecida. Después de que se haya secado el recubrimiento por pulverización, se inoculan las plantas con una suspensión de esporas acuosa de ***Phytophthora infestans***. A continuación, se colocan las plantas en una cabina de incubación a aproximadamente 20 °C y una humedad atmosférica relativa del 100 %.

Se evalúa la prueba 3 días después de la inoculación. 0 % quiere decir una eficacia que corresponde a la del control no tratado, mientras que una eficacia del 100 % quiere decir que no se observó ninguna enfermedad.

La tabla a continuación muestra claramente que la actividad observada de la combinación de principios activos de acuerdo con la invención es mayor que la actividad calculada, es decir, está presente un efecto sinérgico.

Tabla 1

Prueba de Phytophthora (tomates) / protectora

Principios activos		Tasa de aplicación del principio activo en ppm a.i.	Eficacia en %	
			hallada*	calc.**
(I-1)	2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[2-(prop-2-in-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona	0,01	0	
(I-5)	2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[2-fluoro-6-(prop-2-in-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona	0,01	62	
3.1	ametoctradin	10	0	
9.5	mandipropamid	0,2	0	
14.4	fluazinam	10	0	
15.9	cimoxanil	10	0	
15.24	fosetal-Al	10	0	
15.41	ácido fosforoso	10	0	
(I-5) + 3.1	1:1000	0,01 + 10	94	62
(I-1) + 9.5	1:20	0,01 + 0,2	75	0
(I-5) + 9.5	1:20	0,01 + 0,2	95	62
(I-5) + 14.4	1:1000	0,01 + 10	100	62
(I-5) + 15.9	1:1000	0,01 + 10	83	62
(I-1) + 15.24	1:1000	0,01 + 10	80	0
(I-5) + 15.41	1:1000	0,01 + 10	84	62

* hallada = actividad hallada

** calc. = actividad calculada usando la fórmula de Colby

Tabla 2

Prueba de Phytophthora (tomates) / protectora

Principios activos		Tasa de aplicación del principio activo en ppm a.i.	Eficacia en %	
			hallada*	calc.**
(I-1)	2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[2-(prop-2-in-1-iloxi)fenil]-4.5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona	0,01 0,0025	42 52	
(I-5)	2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[2-fluoro-6-(prop-2-in-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona	0,005	43	
3.10	fenamidona	0,25	6	
5.8	oxicloruro de cobre	10 5	10 12	
5.16	folpet	10 5	3 3	
5.25	metiram	10 5	24 12	
10.10	propamocarb-HCl	5	7	
15.60	2.6-dimetil-1H,5H-[1,4]ditiino[2,3-c:5,6-c']dipirrol-1,3,5,7(2H,6H)-tetrona	5	49	
(I-1) + 3.10	1:100	0,0025 + 0,25	74	55
(I-1) + 5.8	1:1000	0,01 + 10	77	48
(I-5) + 5.8	1:1000	0,005 + 5	63	50
(I-1) + 5.16	1:1000	0,01 + 10	56	44
(I-5) + 5.16	1:1000	0,005 + 5	58	45
(I-1) + 5.25	1:1000	0,01 + 10	95	56
(I-5) + 5.25	1:1000	0,005 + 5	60	50
(I-5) + 10.10	1:1000	0,005 + 5	63	47
(I-5) + 15.60	1:1000	0,005 + 5	85	71

* hallada= actividad hallada

** calc. = actividad calculada usando la fórmula de Colby

Tabla 3

Prueba de Phytophthora (tomates) / protectora

Principios activos		Tasa de aplicación del principio activo en ppm a.i.	Eficacia en %	
			hallada*	calc.**
(I-1)	2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[2-(prop-2-in-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona	0,01	29	
5.29	propineb	10	24	
7.7	pirimetanil	10	10	
(I-1) + 5.29	1:1000	0,01 + 10	61	46
(I-1) + 7.7	1:1000	0,01 + 10	50	36

* hallada = actividad hallada

** calc. = actividad calculada usando la fórmula de Colby

Tabla 4

Prueba de Phytophthora (tomates) / protectora

Principios activos		Tasa de aplicación del principio activo en ppm a.i.	Eficacia en %	
			hallada*	calc.**
(I-1)	2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[2-(prop-2-in-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona	0,01	15	
(I-6)	2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[2-cloro-6-(prop-2-in-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona	0,005	35	
3.3	azoxistrobin	1	0	
3.12	fluoxastrobin	2 1	0 0	
3.17	piraclostrobin	2 1	0 0	
3.22	trifloxistrobin	2 1	0 0	
10.10	propamocarb-HCl	10	18	
5.30	azufre	10 5	0 0	
(I-6) + 3.3	200:1	0,005 + 1	65	35
(I-1) + 3.12	200:1	0,01 + 2	60	15
(I-6) + 3.12	200:1	0,005 + 1	68	35
(I-1) + 3.17	200:1	0,01 + 2	50	15
(I-6) + 3.17	200:1	0,005 + 1	86	35
(I-1) + 3.22	200:1	0,01 + 2	58	15
(I-6) + 3.22	200:1	0,005 + 1	65	35
(I-1) + 10.10	1:1000	0,01 + 10	75	30
(I-1) + 5.30	1:1000	0,01 + 10	50	15
(I-6) + 5.30	1:1000	0,005 + 5	55	35

* hallada = actividad hallada

** calc. = actividad calculada usando la fórmula de Colby

Tabla 5

Prueba de Phytophthora (tomates) / protectora

Principios activos		Tasa de aplicación del principio activo en ppm a.i.	Eficacia en %	
			hallada*	calc.**
(I-1)	2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[2-(prop-2-in-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona	0,0025	64	
(I-6)	2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[2-cloro-6-(prop-2-in-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona	0,0025	73	
3.1	ametoctradin	2,5	52	
3.4	cyazofamid	0,1	0	
3.9	famoxadone	2,5	30	
4.6	fluopicolide	0,5	12	
(I-1) + 3.1	1:1000	0,0025 + 2,5	91	83
(I-6) + 3.4	1:40	0,0025 + 0,1	81	73
(I-1) + 3.9	1:1000	0,0025 + 2,5	92	75
(I-1) + 4.6	1:200	0,0025 + 0,5	79	68

* hallada = actividad hallada

** calc. = actividad calculada usando la fórmula de Colby

5

Ejemplo

Prueba de Alternaria (tomates) / preventiva

Disolvente: 24,5 partes en peso de acetona

24,5 partes en peso de dimetilacetamida

Emulsionante: 1 parte en peso de éter alquilaril poliglicólico

Para producir una preparación adecuada del principio activo, se mezcla 1 parte en peso del principio activo con las cantidades establecidas de disolvente y emulsionante, y se diluye el concentrado con agua hasta la concentración deseada.

Para someter a prueba la actividad preventiva, se pulverizan plantas jóvenes con la preparación del principio activo en la tasa de aplicación establecida. Después de que se haya secado el recubrimiento por pulverización, se inoculan las plantas con una suspensión de esporas acuosa de ***Alternaria solani***. A continuación, se colocan las plantas en una cabina de incubación a aproximadamente 20 °C y una humedad atmosférica relativa del 100 %.

Se evalúa la prueba 3 días después de la inoculación. 0 % quiere decir una eficacia que corresponde a la del control no tratado mientras que una eficacia del 100 % quiere decir que no se observó ninguna enfermedad.

La tabla a continuación muestra claramente que la actividad observada de la combinación de principios activos de acuerdo con la invención es mayor que la actividad calculada, es decir, está presente un efecto sinérgico.

Tabla 6

Prueba de Alternaria (tomates) / preventiva

Principios activos		Tasa de aplicación del principio activo en ppm a.i.	Eficacia en %	
			hallada*	calc.**
(I-1)	2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[2-(prop-2-in-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona	100	0	
(I-5)	2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[2-fluoro-6-(prop-2-in-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona	50	15	
5.5	hidróxido de cobre	20	16	
5.23	mancozeb	10	0	
5.29	propineb	20 10	2 0	
7.7	pirimetanil	20	4	
(I-1) + 5.5	5:1	100 + 20	50	16
(I-1) + 5.23	10:1	100 + 10	50	0
(I-1) + 5.29	5:1	100 + 20	50	2
(I-5) + 5.29	5:1	50 + 10	81	15
(I-1) + 7.7	5:1	100 + 20	56	4

* hallada = actividad hallada

** calc. = actividad calculada usando la fórmula de Colby

Tabla 7

Prueba de Alternaria (tomates) / preventiva

Principios activos		Tasa de aplicación del principio activo en ppm a.i.	Eficacia en %	
			hallada*	calc.**
(I-1)	2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[2-(prop-2-in-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona	50	21	
(I-5)	2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[2-fluoro-6-(prop-2-in-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona	50	29	
5.8	oxicloruro de cobre	25	7	
5.16	folpet	5	21	
5.25	metiram	50	36	
15.60	2,6-dimetil-1H,5H-[1,4]ditiino[2,3-c:5,6-c']dipirrol-1,3,5,7(2H,6H)-tetrona	25	29	
(I-1) + 5.8	2:1	50 + 25	64	27
(I-1) + 5.16	10:1	50 + 5	64	38
(I-5) + 5.16	10:1	50 + 5	80	44
(I-1) + 5.25	1:1	50 + 50	71	49
(I-1) + 15.60	2:1	50 + 25	86	44
(I-5) + 15.60	2:1	50 + 25	79	50

* hallada = actividad hallada

** calc. = actividad calculada usando la fórmula de Colby

Tabla 8

Prueba de Alternaria (tomates) / preventiva

Principios activos		Tasa de aplicación del principio activo en ppm a.i.	Eficacia en %	
			hallada*	calc.**
(I-1)	2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[2-(prop-2-in-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona	50	30	
(I-6)	2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[2-cloro-6-(prop-2-in-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona	50 25	35 30	
2.1	bixafen	0,25	60	
2.8	fluxapiroxad	0,125	63	
2.12	isopirazam	0,25	60	
2.29	benzovindiflupir	0,25	40	
(I-1) + 2.1	200:1	50 + 0,25	84	72
(I-6) + 2.1	200:1	50 + 0,25	93	74
(I-6) + 2.8	200:1	25 + 0,125	90	74
(I-1) + 2.12	200:1	50 + 0,25	83	72
(I-1) + 2.29	200:1	50 + 0,25	91	58
(I-6) + 2.29	200:1	50 + 0,25	75	61

* hallada= actividad hallada

** calc. = actividad calculada usando la fórmula de Colby

Tabla 9

Prueba de Alternaria (tomates) / preventiva

Principios activos		Tasa de aplicación del principio activo en ppm a.i.	Eficacia en %	
			hallada*	calc.**
(I-1)	2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[2-(prop-2-in-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona	50	18	
(I-6)	2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[2-cloro-6-(prop-2-in-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona	100 50	41 29	
3.3	azoxistrobin	0,25	9	
3.12	fluoxastrobin	0,5	18	
3.17	piraclostrobin	0,25	18	
3.22	trifloxistrobin	0,25	18	
10.10	propamocarb-HCl	400 200	18 0	
5.30	azufre	200	18	
(I-1) + 3.3	200:1	50 + 0,25	53	25
(I-6) + 3.3	200:1	50 + 0,25	53	35
(I-6) + 3.12	200:1	100 + 0,5	65	52
(I-1) + 3.17	200:1	50 + 0,25	87	33
(I-6) + 3.17	200:1	50 + 0,25	88	42
(I-1) + 3.22	200:1	50 + 0,25	53	33
(I-6) + 3.22	200:1	50 + 0,25	74	42
(I-1) + 10.10	1:4	50 + 200	53	18
(I-6) + 10.10	1:4	100 + 400	65	52
(I-1) + 5.30	1:4	50 + 200	59	33
(I-6) + 5.30	1:4	50 + 200	71	42

* hallada = actividad hallada

** calc. = actividad calculada usando la fórmula de Colby

Ejemplo

Prueba de Venturia (manzanas) / preventiva

Disolvente: 24,5 partes en peso de acetona

24,5 partes en peso de dimetilacetamida

Emulsionante: 1 parte en peso de éter alquilaril poliglicólico

Para producir una preparación adecuada del principio activo, se mezcla 1 parte en peso del principio activo con las cantidades establecidas de disolvente y emulsionante, y se diluye el concentrado con agua hasta la concentración deseada.

Para someter a prueba la actividad preventiva, se pulverizan plantas jóvenes con la preparación del principio activo en la tasa de aplicación establecida. Después de que se haya secado el recubrimiento por pulverización, se inoculan las plantas con una suspensión de conidios acuosa del agente causante de la sarna de la manzana (***Venturia inaequalis***) y a continuación se deja durante 1 día en una cabina de incubación a aproximadamente 20 °C y una humedad atmosférica relativa del 100 %.

A continuación, se colocan las plantas en un invernadero a aproximadamente 21 °C y una humedad atmosférica relativa de aproximadamente 90 %.

Se evalúa la prueba 10 días después de la inoculación. 0 % quiere decir una eficacia que corresponde a la del control no tratado, mientras que una eficacia del 100 % quiere decir que no se observó ninguna enfermedad.

Tabla 10

Prueba de Venturia (manzanas) / preventiva

Principios activos		Tasa de aplicación del principio activo en ppm a.i.	Eficacia en %	
			hallada*	calc.**
(I-1)	2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[2-(prop-2-in-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona	100 25	8 0	
(I-6)	2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[2-cloro-6-(prop-2-in-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona	100 25	4 0	
2.1	bixafen	0,5	26	
2.2	boscalid	12,5	66	
2.6	fluopiram	4	33	
2.8	fluxapiroxad	0,5	54	
2.12	isopirazam	0,5	76	
2.27	N-[1-(2,4-diclorofenil)-1-metoxipropan-2-il]-3-(difluorometil)-1-metil-1H-pirazole-4-carboxamida	4	87	
(I-1) + 2.1	200:1	100 + 0,5	79	32
(I-1) + 2.2	2:1	25 + 12,5	84	66
(I-6) + 2.2	2:1	25 + 12,5	97	66
(I-1) + 2.6	25:1	100 + 4	85	38
(I-6) + 2.6	25:1	100 + 4	85	36
(I-1) + 2.8	200:1	100 + 0,5	89	58
(I-6) + 2.8	200:1	100 + 0,5	98	56
(I-1) + 2.12	200:1	100 + 0,5	99	78
(I-6) + 2.12	200:1	100 + 0,5	89	77
(I-1) + 2.27	25:1	100 + 4	99	88

* hallada = actividad hallada

** calc. = actividad calculada usando la fórmula de Colby

Tabla 11

Prueba de Venturia (manzanas) / preventiva

Principios activos		Tasa de aplicación del principio activo en ppm a.i.	Eficacia en %	
			hallada*	calc.**
(I-1)	2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[2-(prop-2-in-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona	100 50	0 0	
(I-5)	2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[2-fluoro-6-(prop-2-in-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona	100 50	0 0	
(I-6)	2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[2-cloro-6-(prop-2-in-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona	100 50	38 13	
3.22	trifloxistrobin	0,25	0	
5.8	oxicloruro de cobre	50	54	
5.16	folpet	10	43	
5.30	azufre	200	39	
15.60	2,6-dimetil-1H,5H-[1,4]ditiino[2,3-c:5,6-c']dipirrol-1,3,5,7(2H,6H)-tetrona	25	54	
(I-1) + 3.22	200:1	50 + 0,25	82	0
(I-6) + 3.22	200:1	50 + 0,25	81	13
(I-5) + 5.8	2:1	100 + 50	64	54
(I-1) + 5.16	10:1	100 + 10	70	43
(I-5) + 5.16	10:1	100 + 10	78	43
(I-1) + 5.30	1:4	50 + 200	100	39
(I-6) + 5.30	1:4	50 + 200	100	47
(I-5) + 15.60	2:1	50 + 25	78	54

* hallada= actividad hallada

** calc. = actividad calculada usando la fórmula de Colby

Ejemplo

Prueba de Botrytis (alubias) / preventiva

Disolvente: 24,5 partes en peso de acetona

24,5 partes en peso de dimetilacetamida

Emulsionante: 1 parte en peso de éter alquilaril poliglicólico

Para producir una preparación adecuada del principio activo, se mezcla 1 parte en peso del principio activo con las cantidades establecidas de disolvente y emulsionante, y se diluye el concentrado con agua hasta la concentración deseada.

Para someter a prueba la actividad preventiva, se pulverizan plantas jóvenes con la preparación del principio activo. Después de que se haya secado el recubrimiento por pulverización, en cada hoja se colocan 2 pequeñas piezas de agar cubiertas con el cultivo de ***Botrytis cinerea***. Se colocan las plantas inoculadas en una cámara oscura a 20 °C y una humedad atmosférica relativa del 100 %.

2 días después de la inoculación, se evalúa el tamaño de las lesions en las hojas. 0 % quiere decir una eficacia que corresponde a la del control no tratado, mientras que una eficacia del 100 % quiere decir que no se observó ninguna enfermedad.

Se evalúa la prueba 10 días después de la inoculación. 0 % quiere decir una eficacia que corresponde a la del control no tratado, mientras que una eficacia del 100 % quiere decir que no se observó ninguna enfermedad.

Tabla 12

Prueba de Botrytis (alubias) / preventiva

Principios activos		Tasa de aplicación del principio activo en ppm a.i.	Eficacia en %	
			hallada*	calc.**
(I-1)	2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[2-(prop-2-in-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona	50 25	15 15	
(I-5)	2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[2-fluoro-6-(prop-2-in-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona	100 25	38 10	
5.4	clorothalonil	5	8	
5.16	folpet	10	31	
5.23	mancozeb	5	0	
7.7	pirimetanil	10	15	
(I-1) + 5.4	5:1	25 + 5	50	22
(I-5) + 5.4	5:1	25 + 5	80	17
(I-5) + 5.16	10:1	100 + 10	73	57
(I-1) + 5.23	10:1	50 + 5	55	15
(I-1) + 7.7	5:1	50 + 10	65	28

* hallada = actividad hallada

** calc. = actividad calculada usando la fórmula de Colby

Ejemplo

Prueba de Sphaerotheca (pepinos) / preventiva

Disolvente: 24,5 partes en peso de acetona

24,5 partes en peso de dimetilacetamida

Emulsionante: 1 parte en peso de éter alquilaril poliglicólico

Para producir una preparación adecuada del principio activo, se mezcla 1 parte en peso del principio activo con las cantidades establecidas de disolvente y emulsionante, y se diluye el concentrado con agua hasta la concentración deseada.

Para someter a prueba la actividad preventiva, se pulverizan plantas jóvenes con la preparación del principio activo en la tasa de aplicación establecida. Después de que se haya secado el recubrimiento por pulverización, se inoculan las plantas con una suspensión de esporas acuosa de ***Sphaerotheca fuliginea***. A continuación, se colocan las plantas en un invernadero a aproximadamente 23 °C y una humedad atmosférica relativa de aproximadamente 70 %.

Se evalúa la prueba 7 días después de la inoculación. 0 % quiere decir una eficacia que corresponde a la del control no tratado, mientras que una eficacia del 100 % quiere decir que no se observó ninguna enfermedad.

Se evalúa la prueba 10 días después de la inoculación. 0 % quiere decir una eficacia que corresponde a la del control no tratado, mientras que una eficacia del 100 % quiere decir que no se observó ninguna enfermedad.

Tabla 13

Pruea de Sphaerotheca (pepinos) / preventiva

Principios activos		Tasa de aplicación del principio activo en ppm a.i.	Eficacia en %	
			hallada*	calc.**
(I-1)	2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[2-(prop-2-in-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona	50	0	
(I-6)	2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[2-cloro-6-(prop-2-in-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona	50	0	
2.2	boscalid	25	67	
(I-1) + 2.2	2:1	50 + 25	93	67
(I-6) + 2.2	2:1	50 + 25	83	67

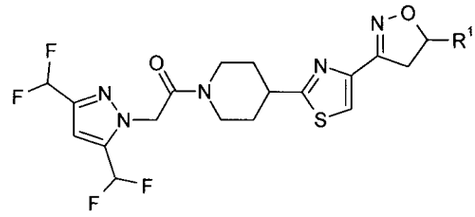
* hallada= actividad hallada

** calc. = actividad calculada usando la fórmula de Colby

REIVINDICACIONES

1. Combinaciones que comprenden:

(A) al menos una tiazolilisoxazolina de fórmula **(I)**



(I)

en la que

R^1 representa fenilo, que está al menos sustituido con un prop-2-en-1-iloxi y opcionalmente está sustituido adicionalmente con uno, dos o tres sustituyentes seleccionados del grupo que consiste en metilo, metoxi, fluoro o cloro o una sal agroquímicamente aceptable de los mismos

y

(B) al menos un principio activo adicional seleccionado de los siguientes grupos

inhibidores de la síntesis de ergosterol,

inhibidores de la cadena respiratoria en el complejo I o II,

inhibidores de la cadena respiratoria en el complejo III,

inhibidores de la mitosis y de la división celular,

compuestos que pueden tener una acción multisitio,

compuestos que pueden inducir una defensa del huésped,

inhibidores de la biosíntesis de aminoácidos y/o proteínas,

inhibidores de la producción de ATP,

inhibidores de la síntesis de la pared celular,

inhibidores de la síntesis de lípidos y membranas,

inhibidores de la biosíntesis de melanina,

inhibidores de la síntesis de ácidos nucleicos,

inhibidores de la transducción de señal,

compuestos que pueden actuar como desacoplador,

otros fungicidas.

2. Combinaciones de acuerdo con la reivindicación 1, que comprenden al menos un compuesto de la fórmula (I) seleccionado del grupo que consiste en

(I-1) 2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[2-(prop-2-en-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona,

(I-2) 2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[4-(prop-2-en-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona,

(I-3) 2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[3-(prop-2-en-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona,

(I-4) 2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[2,6-difluoro-4-(prop-2-en-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona,

(I-5) 2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[2-fluoro-6-(prop-2-en-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona,

(I-6) 2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[2-cloro-6-(prop-2-en-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona,

(I-7) 2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[2,6-difluoro-3-(prop-2-en-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona,

(I-8) 2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[5-fluoro-2-(prop-2-en-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona,

(I-9) 2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[4-metoxi-2-(prop-2-en-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona,

(I-10) 2-[3,5-bis(difluorometil)-1H-pirazol-1-il]-1-[4-(4-{5-[3-fluoro-2-(prop-2-en-1-iloxi)fenil]-4,5-dihidro-1,2-oxazol-3-il}-1,3-tiazol-2-il)piperidin-1-il]etanona,.

3. Combinaciones de acuerdo con la reivindicación 1, que comprenden al menos un principio activo adicional (B) seleccionado de los siguientes grupos:

(2.1) bixafen, (2.2) boscalid, (2.6) fluopiram, (2.8) fluxapiroxad, (2.11) isopirazam (mezcla de racemato syn-epimérico 1RS,4SR,9RS y racemato anti-epimérico 1RS,4SR,9SR), (2.12) isopirazam (racemato anti-epimérico 1RS,4SR,9SR), (2.13) isopirazam (enantiómero anti-epimérico 1R,4S,9S), (2.14) isopirazam (enantiómero anti-epimérico 1S,4R,9R), (2.15) isopirazam (racemato syn-epimérico 1RS,4SR,9RS), (2.16) isopirazam (enantiómero syn-epimérico 1R,4S,9R), (2.17) isopirazam (enantiómero syn-epimérico 1S,4R,9S), (2.27) N-[1-(2.4-diclorofenil)-1-metoxipropan-2-il]-3-(difluorometil)-1-metil-1H-pirazole-4-carboxamida, (2.29) N-[9-(diclorometilen)-1,2,3,4-tetrahidro-1,4-metanonaftalen-5-il]-3-(difluorometil)-1-metil-1H-pirazole-4-carboxamida, (3.1) ametoctradin, (3.2) amisulbrom, (3.3) azoxistrobin, (3.4) cyazofamid, (3.9) famoxadone, (3.10) fenamidona, (3.12) fluoxastrobin, (3.16) picoxistrobin, (3.17) piraclostrobin, (3.22) trifloxistrobin, (4.6) fluopicolide, (5.1) caldo bordelés, (5.4) clorotalonilo, (5.5) hidróxido de cobre, (5.7) óxido de cobre, (5.8) oxicloruro de cobre, (5.9) sulfato de cobre (2+), (5.16) folpet, (5.23) mancozeb, (5.25) metiram, (5.26) metiram zinc, (5.29) propineb, (5.30) azufre y preparaciones de azufre incluyendo polisulfuro de calcio, (7.7) pirimetanilo, (9.2) dimetomorph, (9.4) iprovalicarb, (9.5) mandipropamid, (10.9) propamocarb, (10.10) propamocarb clorhidrato , (12.9) metalaxilo, (12.10) metalaxilo-M (mefenoxam), (14.4) fluazinam, (15.9) cimoxanilo,

(15.24) fosetil-aluminio, (15.25) fosetil-calcio, (15.26) fosetil-sodio, (15.41) ácido fosforoso y sus sales, (15.42) propamocarb-fosetilato, (15.54) 1-(4-{4-[(5R)-5-(2,6-difluorofenil)-4,5-dihidro-1,2-oxazol-3-il]-1,3-tiazol-2-il}piperidin-1-il)-2-[5-metil-3-(trifluorometil)-1H-pirazol-1-il]etanona, (15.55) 1-(4-{4-[(5S)-5-(2,6-difluorofenil)-4,5-dihidro-1,2-oxazol-3-il]-1,3-tiazol-2-il}piperidin-1-il)-2-[5-metil-3-(trifluorometil)-1H-pirazol-1-il]etanona, (15.56) 1-(4-{4-[5-(2,6-difluorofenil)-4,5-dihidro-1,2-oxazol-3-il]-1,3-tiazol-2-il}piperidin-1-il)-2-[5-metil-3-(trifluorometil)-1H-pirazol-1-il]etanona, (15.60) 2,6-dimetil-1H,5H-[1,4]dithiino[2,3-c:5,6-c']dipirrol-1,3,5,7(2H,6H)-tetrona, (15.90) {6-[({[(1-metil-1H-tetrazol-5-il)(fenil)metiliden]amino}oxi)metil]piridin-2-il}carbamato de pentilo.

4. Combinación de acuerdo con las reivindicaciones 1 a 3, que comprende compañeros de mezcla (A):(B) en una proporción en peso de 1:100 a 100:1.

5. Composiciones que comprenden combinaciones de principios activos de acuerdo con la reivindicación 1, 2, 3 o 4 y que comprenden además agentes auxiliares, disolventes, vehículos, tensioactivos o diluyentes.

6. Procedimiento para el control de hongos fitopatógenos en protección de cultivos, caracterizado por que se aplican combinaciones de principios activos de acuerdo con la reivindicación 1, 2, 3 o 4 o composiciones de acuerdo con la reivindicación 5 a la semilla, la planta, a frutos de plantas al suelo en el que la planta crece o se supone que crece.

7. Procedimiento de acuerdo con la reivindicación 6, caracterizado por que se tratan la planta, los frutos de plantas o el suelo en el que la planta crece o se pretende que crezca.

8. Procedimiento de acuerdo con la reivindicación 6, caracterizado por que en el tratamiento de hojas se emplean de 0,1 a 10 000 g/ha y en el tratamiento de semillas de 2 a 200 g por 100 kg de semillas.

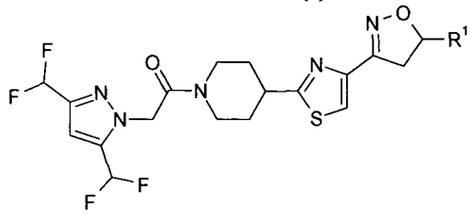
9. Uso de combinaciones de principios activos de acuerdo con la reivindicación 1, 2, 3 o 4 o de composiciones de acuerdo con la reivindicación 5 para el

control de hongos fitopatógenos no deseados en protección de cultivos.

10. Uso de combinaciones de principios activos de acuerdo con la reivindicación o de composiciones de acuerdo con la reivindicación 5 para el tratamiento de semillas, semillas de plantas transgénicas y plantas transgénicas.

11. Semilla tratada con combinaciones de principios activos de acuerdo con la reivindicación 1, 2, 3 o 4 o con composiciones de acuerdo con la reivindicación 5.

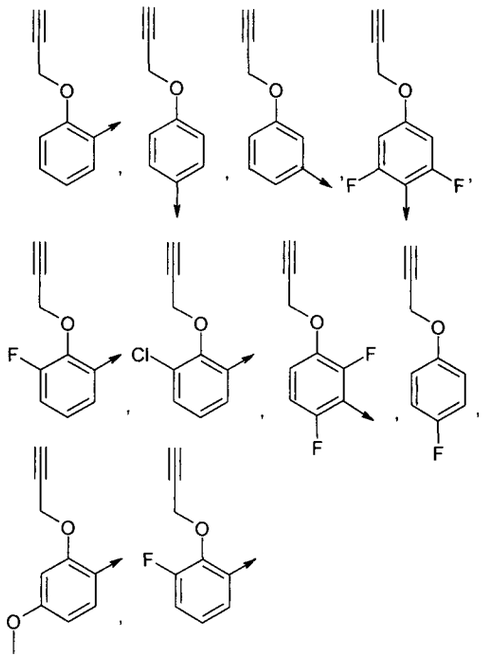
12. Tiazolilisoxazolina de fórmula **(I)**



(I)

en la que

R^1 es



Resumen

La presente invención ser refiere a combinaciones de principios activos, en particular dentro de una composición fungicida, que comprenden (A) una tiazolilsoxazolina de fórmula (I) y otro compuesto de acción fungicida (B). Además, la invención se refiere a un procedimiento para el control curativo o preventivo de hongos fitopatógenos de plantas o cultivos, al uso de una combinación de acuerdo con la invención para el tratamiento de la semilla, a un procedimiento para proteger la semilla y, no por último, a la semilla tratada.

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(54) **Title**: ACTIVE COMPOUND COMBINATIONS

(57) **Abstract**: The present invention relates to active compound combinations, in particular within a fungicide composition, which comprises (A) a thiazolylisoxazoline of formula (I) and a further fungicidally active compound (B). Moreover, the invention relates to a method for curatively or preventively controlling the phytopathogenic fungi of plants or crops, to the use of a combination according to the invention for the treatment of seed, to a method for protecting a seed and not at least to the treated seed.

Active compound combinations

The present invention relates to active compound combinations, in particular within a fungicide composition, which comprises (A) a thiazolylisoxazoline of formula (I) and a further fungicidally active compound (B). Moreover, the invention relates to a method for curatively or preventively controlling the phytopathogenic fungi of plants or crops, to the use of a combination according to the invention for the treatment of seed, to a method for protecting a seed and not at least to the treated seed.

It is already known that certain thiazolylisoxazolines can be used as fungicides (see WO08/013925, WO WO09/094407, WO09/094445, WO09/055514 and PCT/EP2010/070156).

Since the environmental and economic requirements imposed on modern-day crop protection compositions are continually increasing, with regard, for example, to the spectrum of action, toxicity, selectivity, application rate, formation of residues, and favourable preparation ability, and since, furthermore, there may be problems, for example, with resistances, a constant task is to develop new compositions, in particular fungicidal agents, which in some areas at least help to fulfil the abovementioned requirements.

The present invention provides active compound combinations/compositions which in some aspects at least achieve the stated objective.

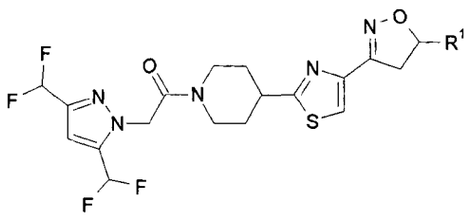
It has now been found, surprisingly, that the combinations according to the invention not only bring about the additive enhancement of the spectrum of action with respect to the phytopathogen to be controlled that was in principle to be expected but achieves a synergistic effect which extends the range of action of the component (A) and of the component (B) in two ways. Firstly, the rates of application of the component (A) and of the component (B) are lowered whilst the action remains equally good. Secondly, the combination still achieves a high degree of phytopathogen control even where the two individual compounds have become totally ineffective in such a low application rate range. This allows, on the one hand, a substantial broadening of the spectrum of phytopathogens that can be controlled and, on the other hand, increased safety in use.

In addition to the fungicidal synergistic activity, the active compound combinations according to the invention have further surprising properties which, in a wider sense, may also be called synergistic, such as, for example: broadening of the activity spectrum to other phytopathogens, for example to resistant strains of plant diseases; lower application rates of the active compounds; sufficient control of pests with the aid of the active compound combinations according to the invention even at application rates where the individual compounds show no or virtually no activity; advantageous behaviour during formulation or during use, for example during grinding, sieving, emulsifying, dissolving or dispensing; improved storage stability and light stability; advantageous residue formation; improved toxicological or ecotoxicological behaviour; improved properties of the plant, for example better growth, increased harvest yields, a better developed root system, a larger leaf area, greener leaves,

stronger shoots, less seed required, lower phytotoxicity, mobilization of the defence system of the plant, good compatibility with plants. Thus, the use of the active compound combinations or compositions according to the invention contributes considerably to keeping young cereal stands healthy, which increases, for example, the winter survival of the cereal seed treated, and also safeguards quality and yield. Moreover, the active compound combinations according to the invention may contribute to enhanced systemic action. Even if the individual compounds of the combination have no sufficient systemic properties, the active compound combinations according to the invention may still have this property. In a similar manner, the active compound combinations according to the invention may result in higher persistency of the fungicidal action.

Accordingly, the present invention provides a combination comprising:

(A) at least one thiazolylisoxazoline of formula **(I)**



(I)

in which

R^1 represents phenyl, which is at least substituted with one prop-2-yn-1-yloxy and optionally be additionally substituted by one, two or three substituents selected from the groups consisting of methyl, methoxy, fluoro or chloro

or an agrochemically acceptable salt thereof,

and

(B) at least one further active compound selected from the following groups

(1) inhibitors of the ergosterol synthesis,

(2) inhibitors of the respiratory chain at complex I or II,

(3) inhibitors of the respiratory chain at complex III,

(4) inhibitors of the mitosis and cell division,

(5) compounds capable of having a multisite action,

(6) compounds capable of inducing a host defense,

(7) inhibitors of the amino acid and/or protein biosynthesis,

(8) inhibitors of the ATP production,

(9) inhibitors of the cell wall synthesis,

(10) inhibitors of the lipid and membrane synthesis,

(11) inhibitors of the melanine biosynthesis,

(12) inhibitors of the nucleic acid synthesis,

(13) inhibitors of the signal transduction,

(14) compounds capable of acting as uncoupler,

(15) other fungicides.

Preference is given to combinations comprising at least one compound of the formula (I) selected from the group consisting of

(I-1) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-2) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[4-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-3) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[3-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-4) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2,6-difluoro-4-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-5) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-fluoro-6-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-6) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-chloro-6-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

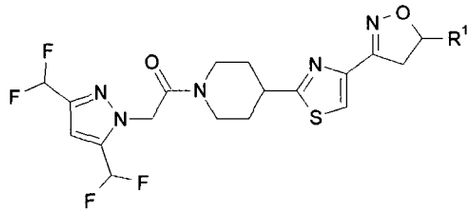
(I-7) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2,6-difluoro-3-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-8) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[5-fluoro-2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-9) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[4-methoxy-2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-10) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[3-fluoro-2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone.

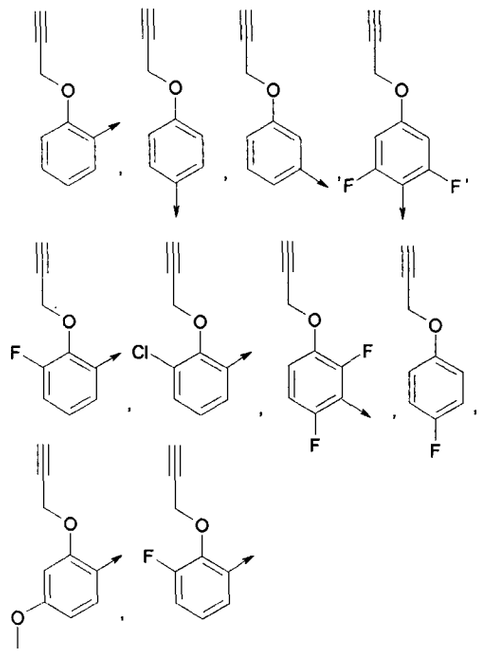
The present invention is also directed to thiazolylisoxazoline of formula **(I)**



(I)

in which

R^1 is



Thiazolylisoxazoline of formula (I) according to the present invention are:

(I-1) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-2) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[4-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-3) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[3-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-4) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2,6-difluoro-4-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-5) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-fluoro-6-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-6) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-chloro-6-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-7) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2,6-difluoro-3-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-8) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[5-fluoro-2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-9) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[4-methoxy-2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-10) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[3-fluoro-2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone.

In the description below numbers in parenthesis behind a compound name represent the CAS Registry No. of said compound.

Preference is further given to combinations comprising at least one further active compound (B) selected from the following groups:

(1) Inhibitors of the ergosterol biosynthesis, for example (1.1) aldimorph (1704-28-5), (1.2) azaconazole (60207-31-0), (1.3) bitertanol (55179-31-2), (1.4) bromuconazole (116255-48-2), (1.5) cyproconazole (113096-99-4), (1.6) diclobutrazole (75736-33-3), (1.7) difenoconazole (119446-68-3), (1.8) diniconazole (83657-24-3), (1.9) diniconazole-M (83657-18-5), (1.10) dodemorph (1593-77-7), (1.11) dodemorph acetate (31717-87-0), (1.12) epoxiconazole (106325-08-0), (1.13) etaconazole (60207-93-4), (1.14) fenarimol (60168-88-9), (1.15) fenbuconazole (114369-43-6), (1.16) fenhexamid (126833-17-8), (1.17) fenpropidin (67306-00-7), (1.18) fenpropimorph (67306-03-0), (1.19) fluquinconazole (136426-54-5), (1.20) flurprimidol (56425-91-3), (1.21) flusilazole (85509-19-9), (1.22) flutriafol (76674-21-0), (1.23) furconazole (112839-33-5), (1.24) furconazole-cis (112839-32-4), (1.25) hexaconazole (79983-71-4), (1.26) imazalil (60534-80-7), (1.27) imazalil sulfate (58594-72-2), (1.28) imibenconazole (86598-92-7), (1.29) ipconazole (125225-28-7), (1.30) metconazole (125116-23-6), (1.31) myclobutanil (88671-89-0), (1.32) naftifine (65472-88-0), (1.33) nuarimol (63284-71-9), (1.34) oxpoconazole (174212-12-5), (1.35) paclobutrazol (76738-62-0), (1.36) pefurazoate (101903-30-4), (1.37) penconazole (66246-88-6), (1.38) piperalin (3478-94-2), (1.39) prochloraz (67747-09-5), (1.40) propiconazole (60207-90-1), (1.41) prothioconazole (178928-70-6), (1.42) pyributicarb (88678-67-5), (1.43) pyrifenox (88283-41-4), (1.44) quinconazole (103970-75-8), (1.45) simeconazole (149508-90-7), (1.46) spiroxamine (118134-30-8), (1.47) tebuconazole (107534-96-3), (1.48) terbinafine (91161-71-6), (1.49) tetraconazole (112281-77-3), (1.50) triadimefon (43121-43-3), (1.51) triadimenol (89482-17-7), (1.52) tridemorph (81412-43-3), (1.53) triflumizole (68694-11-1), (1.54) triforine (26644-46-2), (1.55) triticonazole (131983-72-7), (1.56) uniconazole (83657-22-1), (1.57) uniconazole-p (83657-17-4), (1.58) viniconazole (77174-66-4), (1.59) voriconazole (137234-62-9), (1.60) 1-(4-chlorophenyl)-2-(1H-1,2,4-triazol-1-yl)cycloheptanol (129586-32-9), (1.61) methyl 1-(2,2-dimethyl-2,3-dihydro-1H-inden-1-yl)-1H-imidazole-5-carboxylate (110323-95-0), (1.62) N'-{5-(difluoromethyl)-2-methyl-4-[3-(trimethylsilyl)propoxy]phenyl}-N-ethyl-N-

methylimidoformamide, (1.63) N-ethyl-N-methyl-N'-{2-methyl-5-(trifluoromethyl)-4-[3-(trimethylsilyl)propoxy]phenyl}imidoformamide and (1.64) O-[1-(4-methoxyphenoxy)-3,3-dimethylbutan-2-yl] 1H-imidazole-1-carbothioate (111226-71-2).

(2) inhibitors of the respiratory chain at complex I or II, for example (2.1) bixafen (581809-46-3), (2.2) boscalid (188425-85-6), (2.3) carboxin (5234-68-4), (2.4) diflumetorim (130339-07-0), (2.5) fenfuram (24691-80-3), (2.6) fluopyram (658066-35-4), (2.7) flutolanil (66332-96-5), (2.8) fluxapyroxad (907204-31-3), (2.9) furametpyr (123572-88-3), (2.10) furmecyclox (60568-05-0), (2.11) isopyrazam (mixture of syn-epimeric racemate 1RS,4SR,9RS and anti-epimeric racemate 1RS,4SR,9SR) (881685-58-1), (2.12) isopyrazam (anti-epimeric racemate 1RS,4SR,9SR), (2.13) isopyrazam (anti-epimeric enantiomer 1R,4S,9S), (2.14) isopyrazam (anti-epimeric enantiomer 1S,4R,9R), (2.15) isopyrazam (syn epimeric racemate 1RS,4SR,9RS), (2.16) isopyrazam (syn-epimeric enantiomer 1R,4S,9R), (2.17) isopyrazam (syn-epimeric enantiomer 1S,4R,9S), (2.18) mepronil (55814-41-0), (2.19) oxycarboxin (5259-88-1), (2.20) penflufen (494793-67-8), (2.21) penthiopyrad (183675-82-3), (2.22) sedaxane (874967-67-6), (2.23) thifluzamide (130000-40-7), (2.24) 1-methyl-N-[2-(1,1,2,2-tetrafluoroethoxy)phenyl]-3-(trifluoromethyl)-1H-pyrazole-4-carboxamide, (2.25) 3-(difluoromethyl)-1-methyl-N-[2-(1,1,2,2-tetrafluoroethoxy)phenyl]-1H-pyrazole-4-carboxamide, (2.26) 3-(difluoromethyl)-N-[4-fluoro-2-(1,1,2,3,3,3-hexafluoropropoxy)phenyl]-1-methyl-1H-pyrazole-4-carboxamide, (2.27) N-[1-(2,4-dichlorophenyl)-1-methoxypropan-2-yl]-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide (1092400-95-7) (WO 2008148570), (2.28) 5,8-difluoro-N-[2-(2-fluoro-4-{[4-(trifluoromethyl)pyridin-2-yl]oxy}phenyl)ethyl]quinazolin-4-amine (1210070-84-0) (WO2010025451) (2.29) N-[9-(dichloromethylene)-1,2,3,4-tetrahydro-1,4-methanonaphthalen-5-yl]-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide, (2.30) N-[(1S,4R)-9-(dichloromethylene)-1,2,3,4-tetrahydro-1,4-methanonaphthalen-5-yl]-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide and (2.31) N-[(1R,4S)-9-(dichloromethylene)-1,2,3,4-tetrahydro-1,4-methanonaphthalen-5-yl]-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide.

(3) inhibitors of the respiratory chain at complex III, for example (3.1) ametoctradin (865318-97-4), (3.2) amisulbrom (348635-87-0), (3.3) azoxystrobin (131860-33-8), (3.4) cyazofamid (120116-88-3), (3.5) coumethoxystrobin (850881-30-0), (3.6) coumoxystrobin (850881-70-8), (3.7) dimoxystrobin (141600-52-4), (3.8) enestroburin (238410-11-2) (WO 2004/058723), (3.9) famoxadone (131807-57-3) (WO 2004/058723), (3.10) fenamidone (161326-34-7) (WO 2004/058723), (3.11) fenoxystrobin (918162-02-4), (3.12) fluoxastrobin (361377-29-9) (WO 2004/058723), (3.13) kresoxim-methyl (143390-89-0) (WO 2004/058723), (3.14) metominostrobin (133408-50-1) (WO 2004/058723), (3.15) orysastrobin (189892-69-1) (WO 2004/058723), (3.16) picoxystrobin (117428-22-5) (WO 2004/058723), (3.17) pyraclostrobin (175013-18-0) (WO 2004/058723), (3.18) pyrametostrobin (915410-70-7) (WO 2004/058723), (3.19) pyraoxystrobin (862588-11-2) (WO 2004/058723), (3.20) pyribencarb (799247-

52-2) (WO 2004/058723), (3.21) triclopyricarb (902760-40-1), (3.22) trifloxystrobin (141517-21-7) (WO 2004/058723), (3.23) (2E)-2-(2-{[6-(3-chloro-2-methylphenoxy)-5-fluoropyrimidin-4-yl]oxy}phenyl)-2-(methoxyimino)-N-methylethanamide (WO 2004/058723), (3.24) (2E)-2-(methoxyimino)-N-methyl-2-(2-{[({(1E)-1-[3-(trifluoromethyl)phenyl]ethylidene}amino)oxy]methyl}phenyl)ethanamide (WO 2004/058723), (3.25) (2E)-2-(methoxyimino)-N-methyl-2-{2-[(E)-({1-[3-(trifluoromethyl)phenyl]ethoxy}imino)methyl]phenyl}ethanamide (158169-73-4), (3.26) (2E)-2-{2-[({[(1E)-1-(3-{[(E)-1-fluoro-2-phenylethenyl]oxy}phenyl)ethylidene]amino}oxy)methyl]phenyl}-2-(methoxyimino)-N-methylethanamide (326896-28-0), (3.27) (2E)-2-{2-[({[(2E,3E)-4-(2,6-dichlorophenyl)but-3-en-2-ylidene]amino}oxy)methyl]phenyl}-2-(methoxyimino)-N-methylethanamide, (3.28) 2-chloro-N-(1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl)pyridine-3-carboxamide (119899-14-8), (3.29) 5-methoxy-2-methyl-4-(2-{[({(1E)-1-[3-(trifluoromethyl)phenyl]ethylidene}amino)oxy]-methyl}phenyl)-2,4-dihydro-3H-1,2,4-triazol-3-one, (3.30) methyl (2E)-2-{2-[({cyclopropyl[(4-methoxyphenyl)imino]methyl}sulfanyl)methyl]phenyl}-3-methoxyprop-2-enoate (149601-03-6), (3.31) N-(3-ethyl-3,5,5-trimethylcyclohexyl)-3-(formylamino)-2-hydroxybenzamide (226551-21-9), (3.32) 2-{2-[(2,5-dimethylphenoxy)methyl]phenyl}-2-methoxy-N-methylacetamide (173662-97-0) and (3.33) (2R)-2-{2-[(2,5-dimethylphenoxy)methyl]phenyl}-2-methoxy-N-methylacetamide (394657-24-0).

(4) Inhibitors of the mitosis and cell division, for example (4.1) benomyl (17804-35-2), (4.2) carbendazim (10605-21-7), (4.3) chlorfenazole (3574-96-7), (4.4) diethofencarb (87130-20-9), (4.5) ethaboxam (162650-77-3), (4.6) fluopicolide (239110-15-7), (4.7) fuberidazole (3878-19-1), (4.8) pencycuron (66063-05-6), (4.9) thiabendazole (148-79-8), (4.10) thiophanate-methyl (23564-05-8), (4.11) thiophanate (23564-06-9), (4.12) zoxamide (156052-68-5), (4.13) 5-chloro-7-(4-methylpiperidin-1-yl)-6-(2,4,6-trifluorophenyl)[1,2,4]triazolo[1,5-a]pyrimidine (214706-53-3) and (4.14) 3-chloro-5-(6-chloropyridin-3-yl)-6-methyl-4-(2,4,6-trifluorophenyl)pyridazine (1002756-87-7).

(5) Compounds capable to have a multisite action, like for example (5.1) bordeaux mixture (8011-63-0), (5.2) captafol (2425-06-1), (5.3) captan (133-06-2) (WO 02/12172), (5.4) chlorothalonil (1897-45-6), (5.5) copper hydroxide (20427-59-2), (5.6) copper naphthenate (1338-02-9), (5.7) copper oxide (1317-39-1), (5.8) copper oxychloride (1332-40-7), (5.9) copper(2+) sulfate (7758-98-7), (5.10) dichlofluanid (1085-98-9), (5.11) dithianon (3347-22-6), (5.12) dodine (2439-10-3), (5.13) dodine free base, (5.14) ferbam (14484-64-1), (5.15) fluorofolpet (719-96-0), (5.16) folpet (133-07-3), (5.17) guazatine (108173-90-6), (5.18) guazatine acetate, (5.19) iminoctadine (13516-27-3), (5.20) iminoctadine albesilate (169202-06-6), (5.21) iminoctadine triacetate (57520-17-9), (5.22) mancopper (53988-93-5), (5.23) mancozeb (8018-01-7), (5.24) maneb (12427-38-2), (5.25) metiram (9006-42-2), (5.26) metiram zinc (9006-42-2), (5.27) oxine-copper (10380-28-6), (5.28) propamidine (104-32-5), (5.29) propineb (12071-

83-9), (5.30) sulphur and sulphur preparations including calcium polysulphide (7704-34-9), (5.31) thiram (137-26-8), (5.32) tolylfluanid (731-27-1), (5.33) zineb (12122-67-7) and (5.34) ziram (137-30-4).

(6) Compounds capable to induce a host defence, like for example (6.1) acibenzolar-S-methyl (135158-54-2), (6.2) isotianil (224049-04-1), (6.3) probenazole (27605-76-1) and (6.4) tiadinil (223580-51-6).

(7) Inhibitors of the amino acid and/or protein biosynthesis, for example (7.1) andoprim (23951-85-1), (7.2) blasticidin-S (2079-00-7), (7.3) cyprodinil (121552-61-2), (7.4) kasugamycin (6980-18-3), (7.5) kasugamycin hydrochloride hydrate (19408-46-9), (7.6) mepanipyrim (110235-47-7), (7.7) pyrimethanil (53112-28-0) and (7.8) 3-(5-fluoro-3,3,4,4-tetramethyl-3,4-dihydroisoquinolin-1-yl)quinoline (861647-32-7) (WO2005070917).

(8) Inhibitors of the ATP production, for example (8.1) fentin acetate (900-95-8), (8.2) fentin chloride (639-58-7), (8.3) fentin hydroxide (76-87-9) and (8.4) silthiofam (175217-20-6).

(9) Inhibitors of the cell wall synthesis, for example (9.1) benthiavalicarb (177406-68-7), (9.2) dimethomorph (110488-70-5), (9.3) flumorph (211867-47-9), (9.4) iprovalicarb (140923-17-7), (9.5) mandipropamid (374726-62-2), (9.6) polyoxins (11113-80-7), (9.7) polyoxorim (22976-86-9), (9.8) validamycin A (37248-47-8) and (9.9) valifenalate (283159-94-4; 283159-90-0).

(10) Inhibitors of the lipid and membrane synthesis, for example (10.1) biphenyl (92-52-4), (10.2) chloroneb (2675-77-6), (10.3) dicloran (99-30-9), (10.4) edifenphos (17109-49-8), (10.5) etridiazole (2593-15-9), (10.6) iodocarb (55406-53-6), (10.7) iprobenfos (26087-47-8), (10.8) isoprothiolane (50512-35-1), (10.9) propamocarb (25606-41-1), (10.10) propamocarb hydrochloride (25606-41-1), (10.11) prothiocarb (19622-08-3), (10.12) pyrazophos (13457-18-6), (10.13) quintozene (82-68-8), (10.14) tecnazene (117-18-0) and (10.15) tolclofos-methyl (57018-04-9).

(11) Inhibitors of the melanine biosynthesis, for example (11.1) carpropamid (104030-54-8), (11.2) diclocymet (139920-32-4), (11.3) fenoxanil (115852-48-7), (11.4) phthalide (27355-22-2), (11.5) pyroquilon (57369-32-1), (11.6) tricyclazole (41814-78-2) and (11.7) 2,2,2-trifluoroethyl {3-methyl-1-[(4-methylbenzoyl)amino]butan-2-yl}carbamate (851524-22-6) (WO2005042474).

(12) Inhibitors of the nucleic acid synthesis, for example (12.1) benalaxyl (71626-11-4), (12.2) benalaxyl-M (kiralaxyl) (98243-83-5), (12.3) bupirimate (41483-43-6), (12.4) clozylacon (67932-85-8), (12.5) dimethirimol (5221-53-4), (12.6) ethirimol (23947-60-6), (12.7) furalaxyl (57646-30-7), (12.8) hymexazol (10004-44-1), (12.9) metalaxyl (57837-19-1), (12.10) metalaxyl-M (mefenoxam) (70630-17-0), (12.11) ofurace (58810-48-3), (12.12) oxadixyl (77732-09-3) and (12.13) oxolinic acid (14698-29-4).

(13) Inhibitors of the signal transduction, for example (13.1) chlozolinate (84332-86-5), (13.2) fenpiclonil (74738-17-3), (13.3) fludioxonil (131341-86-1), (13.4) iprodione (36734-19-7), (13.5) procymidone (32809-16-8), (13.6) quinoxyfen (124495-18-7) and (13.7) vinclozolin (50471-44-8).

(14) Compounds capable to act as an uncoupler, like for example (14.1) binapacryl (485-31-4), (14.2) dinocap (131-72-6), (14.3) ferimzone (89269-64-7), (14.4) fluazinam (79622-59-6) and (14.5) meptyldinocap (131-72-6).

(15) Further compounds, like for example (15.1) benthiazole (21564-17-0), (15.2) bethoxazin (163269-30-5), (15.3) capsimycin (70694-08-5), (15.4) carvone (99-49-0), (15.5) chinomethionat (2439-01-2), (15.6) pyriofenone (chlazafenone) (688046-61-9), (15.7) cufraneb (11096-18-7), (15.8) cyflufenamid (180409-60-3), (15.9) cymoxanil (57966-95-7), (15.10) cyprosulfamide (221667-31-8), (15.11) dazomet (533-74-4), (15.12) debacarb (62732-91-6), (15.13) dichlorophen (97-23-4), (15.14) diclomezine (62865-36-5), (15.15) difenzoquat (49866-87-7), (15.16) difenzoquat methylsulphate (43222-48-6), (15.17) diphenylamine (122-39-4), (15.18) ecomate, (15.19) fenpyrazamine (473798-59-3), (15.20) flumetover (154025-04-4), (15.21) fluoroimide (41205-21-4), (15.22) flusulfamide (106917-52-6), (15.23) flutianil (304900-25-2), (15.24) fosetyl-aluminium (39148-24-8), (15.25) fosetyl-calcium, (15.26) fosetyl-sodium (39148-16-8), (15.27) hexachlorobenzene (118-74-1), (15.28) irumamycin (81604-73-1), (15.29) methasulfocarb (66952-49-6), (15.30) methyl isothiocyanate (556-61-6), (15.31) metrafenone (220899-03-6), (15.32) mildiomycin (67527-71-3), (15.33) natamycin (7681-93-8), (15.34) nickel dimethyldithiocarbamate (15521-65-0), (15.35) nitrothal-isopropyl (10552-74-6), (15.36) octhilinone (26530-20-1), (15.37) oxamocarb (917242-12-7), (15.38) oxyfenthiin (34407-87-9), (15.39) pentachlorophenol and salts (87-86-5), (15.40) phenothrin, (15.41) phosphorous acid and its salts (13598-36-2), (15.42) propamocarb-fosetylate, (15.43) propanosine-sodium (88498-02-6), (15.44) proquinazid (189278-12-4), (15.45) pyrimorph (868390-90-3), (15.45e) (2E)-3-(4-tert-butylphenyl)-3-(2-chloropyridin-4-yl)-1-(morpholin-4-yl)prop-2-en-1-one (1231776-28-5), (15.45z) (2Z)-3-(4-tert-butylphenyl)-3-(2-chloropyridin-4-yl)-1-(morpholin-4-yl)prop-2-en-1-one (1231776-29-6), (15.46) pyrrolnitrine (1018-71-9) (EP-A 1 559 320), (15.47) tebufloquin (376645-78-2), (15.48) tecloftalam (76280-91-6), (15.49) tolnifanide (304911-98-6), (15.50) triazoxide (72459-58-6), (15.51) trichlamide (70193-21-4), (15.52) zarilamid (84527-51-5), (15.53) (3S,6S,7R,8R)-8-benzyl-3-[({3-[(isobutyryloxy)methoxy]-4-methoxypyridin-2-yl}carbonyl)amino]-6-methyl-4,9-dioxo-1,5-dioxonan-7-yl 2-methylpropanoate (517875-34-2) (WO2003035617), (15.54) 1-(4-{4-[(5R)-5-(2,6-difluorophenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)-2-[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]ethanone (1003319-79-6) (WO 2008013622), (15.55) 1-(4-{4-[(5S)-5-(2,6-difluorophenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)-2-[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]ethanone (1003319-80-9) (WO 2008013622), (15.56) 1-(4-{4-[5-(2,6-difluorophenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)-2-[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]ethanone (1003318-

67-9) (WO 2008013622), (15.57) 1-(4-methoxyphenoxy)-3,3-dimethylbutan-2-yl 1H-imidazole-1-carboxylate (111227-17-9), (15.58) 2,3,5,6-tetrachloro-4-(methylsulfonyl)pyridine (13108-52-6), (15.59) 2,3-dibutyl-6-chlorothieno[2,3-d]pyrimidin-4(3H)-one (221451-58-7), (15.60) 2,6-dimethyl-1H,5H-[1,4]dithiino[2,3-c:5,6-c']dipyrrole-1,3,5,7(2H,6H)-tetrone, (15.61) 2-[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]-1-(4-{4-[(5R)-5-phenyl-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)ethanone (1003316-53-7) (WO 2008013622), (15.62) 2-[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]-1-(4-{4-[(5S)-5-phenyl-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)ethanone (1003316-54-8) (WO 2008013622), (15.63) 2-[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]-1-{4-[4-(5-phenyl-4,5-dihydro-1,2-oxazol-3-yl)-1,3-thiazol-2-yl]piperidin-1-yl}ethanone (1003316-51-5) (WO 2008013622), (15.64) 2-butoxy-6-iodo-3-propyl-4H-chromen-4-one, (15.65) 2-chloro-5-[2-chloro-1-(2,6-difluoro-4-methoxyphenyl)-4-methyl-1H-imidazol-5-yl]pyridine, (15.66) 2-phenylphenol and salts (90-43-7), (15.67) 3-(4,4,5-trifluoro-3,3-dimethyl-3,4-dihydroisoquinolin-1-yl)quinoline (861647-85-0) (WO2005070917), (15.68) 3,4,5-trichloropyridine-2,6-dicarbonitrile (17824-85-0), (15.69) 3-[5-(4-chlorophenyl)-2,3-dimethyl-1,2-oxazolidin-3-yl]pyridine, (15.70) 3-chloro-5-(4-chlorophenyl)-4-(2,6-difluorophenyl)-6-methylpyridazine, (15.71) 4-(4-chlorophenyl)-5-(2,6-difluorophenyl)-3,6-dimethylpyridazine, (15.72) 5-amino-1,3,4-thiadiazole-2-thiol, (15.73) 5-chloro-N'-phenyl-N'-(prop-2-yn-1-yl)thiophene-2-sulfonohydrazide (134-31-6), (15.74) 5-fluoro-2-[(4-fluorobenzyl)oxy]pyrimidin-4-amine (1174376-11-4) (WO2009094442), (15.75) 5-fluoro-2-[(4-methylbenzyl)oxy]pyrimidin-4-amine (1174376-25-0) (WO2009094442), (15.76) 5-methyl-6-octyl[1,2,4]triazolo[1,5-a]pyrimidin-7-amine, (15.77) ethyl (2Z)-3-amino-2-cyano-3-phenylprop-2-enoate, (15.78) N'-(4-{[3-(4-chlorobenzyl)-1,2,4-thiadiazol-5-yl]oxy}-2,5-dimethylphenyl)-N-ethyl-N-methylimidoformamide, (15.79) N-(4-chlorobenzyl)-3-[3-methoxy-4-(prop-2-yn-1-yloxy)phenyl]propanamide, (15.80) N-[(4-chlorophenyl)(cyano)methyl]-3-[3-methoxy-4-(prop-2-yn-1-yloxy)phenyl]propanamide, (15.81) N-[(5-bromo-3-chloropyridin-2-yl)methyl]-2,4-dichloropyridine-3-carboxamide, (15.82) N-[1-(5-bromo-3-chloropyridin-2-yl)ethyl]-2,4-dichloropyridine-3-carboxamide, (15.83) N-[1-(5-bromo-3-chloropyridin-2-yl)ethyl]-2-fluoro-4-iodopyridine-3-carboxamide, (15.84) N-{(E)-[(cyclopropylmethoxy)imino][6-(difluoromethoxy)-2,3-difluorophenyl]methyl}-2-phenylacetamide (221201-92-9), (15.85) N-{(Z)-[(cyclopropylmethoxy)imino][6-(difluoromethoxy)-2,3-difluorophenyl]methyl}-2-phenylacetamide (221201-92-9), (15.86) N'-{4-[(3-tert-butyl-4-cyano-1,2-thiazol-5-yl)oxy]-2-chloro-5-methylphenyl}-N-ethyl-N-methylimidoformamide, (15.87) N-methyl-2-(1-{[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]acetyl}piperidin-4-yl)-N-(1,2,3,4-tetrahydronaphthalen-1-yl)-1,3-thiazole-4-carboxamide (922514-49-6) (WO 2007014290), (15.88) N-methyl-2-(1-{[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]acetyl}piperidin-4-yl)-N-[(1R)-1,2,3,4-tetrahydronaphthalen-1-yl]-1,3-thiazole-4-carboxamide (922514-07-6) (WO 2007014290), (15.89) N-methyl-2-(1-{[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]acetyl}piperidin-4-yl)-N-[(1S)-1,2,3,4-tetrahydronaphthalen-1-yl]-1,3-thiazole-4-carboxamide (922514-48-5) (WO 2007014290), (15.90) pentyl {6-[({[(1-methyl-1H-tetrazol-5-

yl)(phenyl)methylidene]amino}oxy)methyl]pyridin-2-yl}carbamate, (15.91) phenazine-1-carboxylic acid, (15.92) quinolin-8-ol (134-31-6), (15.93) quinolin-8-ol sulfate (2:1) (134-31-6) and (15.94) tert-butyl {6-[({[(1-methyl-1H-tetrazol-5-yl)(phenyl)methylene]amino}oxy)methyl]pyridin-2-yl}carbamate.

(16) Further compounds, for example (16.1) 1-methyl-3-(trifluoromethyl)-N-[2'-(trifluoromethyl)biphenyl-2-yl]-1H-pyrazole-4-carboxamide, (16.2) N-(4'-chlorobiphenyl-2-yl)-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide, (16.3) N-(2',4'-dichlorobiphenyl-2-yl)-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide, (16.4) 3-(difluoromethyl)-1-methyl-N-[4'-(trifluoromethyl)biphenyl-2-yl]-1H-pyrazole-4-carboxamide, (16.5) N-(2',5'-difluorobiphenyl-2-yl)-1-methyl-3-(trifluoromethyl)-1H-pyrazole-4-carboxamide, (16.6) 3-(difluoromethyl)-1-methyl-N-[4'-(prop-1-yn-1-yl)biphenyl-2-yl]-1H-pyrazole-4-carboxamide (known from WO 2004/058723), (16.7) 5-fluoro-1,3-dimethyl-N-[4'-(prop-1-yn-1-yl)biphenyl-2-yl]-1H-pyrazole-4-carboxamide (known from WO 2004/058723), (16.8) 2-chloro-N-[4'-(prop-1-yn-1-yl)biphenyl-2-yl]pyridine-3-carboxamide (known from WO 2004/058723), (16.9) 3-(difluoromethyl)-N-[4'-(3,3-dimethylbut-1-yn-1-yl)biphenyl-2-yl]-1-methyl-1H-pyrazole-4-carboxamide (known from WO 2004/058723), (16.10) N-[4'-(3,3-dimethylbut-1-yn-1-yl)biphenyl-2-yl]-5-fluoro-1,3-dimethyl-1H-pyrazole-4-carboxamide (known from WO 2004/058723), (16.11) 3-(difluoromethyl)-N-(4'-ethynylbiphenyl-2-yl)-1-methyl-1H-pyrazole-4-carboxamide (known from WO 2004/058723), (16.12) N-(4'-ethynylbiphenyl-2-yl)-5-fluoro-1,3-dimethyl-1H-pyrazole-4-carboxamide (known from WO 2004/058723), (16.13) 2-chloro-N-(4'-ethynylbiphenyl-2-yl)pyridine-3-carboxamide (known from WO 2004/058723), (16.14) 2-chloro-N-[4'-(3,3-dimethylbut-1-yn-1-yl)biphenyl-2-yl]pyridine-3-carboxamide (known from WO 2004/058723), (16.15) 4-(difluoromethyl)-2-methyl-N-[4'-(trifluoromethyl)biphenyl-2-yl]-1,3-thiazole-5-carboxamide (known from WO 2004/058723), (16.16) 5-fluoro-N-[4'-(3-hydroxy-3-methylbut-1-yn-1-yl)biphenyl-2-yl]-1,3-dimethyl-1H-pyrazole-4-carboxamide (known from WO 2004/058723), (16.17) 2-chloro-N-[4'-(3-hydroxy-3-methylbut-1-yn-1-yl)biphenyl-2-yl]pyridine-3-carboxamide (known from WO 2004/058723), (16.18) 3-(difluoromethyl)-N-[4'-(3-methoxy-3-methylbut-1-yn-1-yl)biphenyl-2-yl]-1-methyl-1H-pyrazole-4-carboxamide (known from WO 2004/058723), (16.19) 5-fluoro-N-[4'-(3-methoxy-3-methylbut-1-yn-1-yl)biphenyl-2-yl]-1,3-dimethyl-1H-pyrazole-4-carboxamide (known from WO 2004/058723), (16.20) 2-chloro-N-[4'-(3-methoxy-3-methylbut-1-yn-1-yl)biphenyl-2-yl]pyridine-3-carboxamide (known from WO 2004/058723), (16.21) (5-bromo-2-methoxy-4-methylpyridin-3-yl)(2,3,4-trimethoxy-6-methylphenyl)methanone (known from EP-A 1 559 320), (16.22) N-[2-(4-{[3-(4-chlorophenyl)prop-2-yn-1-yl]oxy}-3-methoxyphenyl)ethyl]-N2-(methylsulfonyl)valinamide (220706-93-4), (16.23) 4-oxo-4-[(2-phenylethyl)amino]butanoic acid and (16.24) but-3-yn-1-yl {6-[({[(Z)-(1-methyl-1H-tetrazol-5-yl)(phenyl)methylene]amino}oxy)methyl]pyridin-2-yl}carbamate.

All named mixing partners of the classes (1) to (16) can, if their functional groups enable this, optionally form salts with suitable bases or acids.

Particular preference is further given to combinations comprising at least one further active compound (B) selected from the following groups:

(2.1) bixafen, (2.2) boscalid, (2.6) fluopyram, (2.8) fluxapyroxad, (2.11) isopyrazam (mixture of syn-epimeric racemate 1RS,4SR,9RS and anti-epimeric racemate 1RS,4SR,9SR), (2.12) isopyrazam (anti-epimeric racemate 1RS,4SR,9SR), (2.13) isopyrazam (anti-epimeric enantiomer 1R,4S,9S), (2.14) isopyrazam (anti-epimeric enantiomer 1S,4R,9R), (2.15) isopyrazam (syn epimeric racemate 1RS,4SR,9RS), (2.16) isopyrazam (syn-epimeric enantiomer 1R,4S,9R), (2.17) isopyrazam (syn-epimeric enantiomer 1S,4R,9S), (2.27) N-[1-(2,4-dichlorophenyl)-1-methoxypropan-2-yl]-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide, (2.29) N-[9-(dichloromethylene)-1,2,3,4-tetrahydro-1,4-methanonaphthalen-5-yl]-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide, (3.1) ametoctradin, (3.2) amisulbrom, (3.3) azoxystrobin, (3.4) cyazofamid, (3.9) famoxadone, (3.10) fenamidone, (3.12) fluoxastrobin, (3.16) picoxystrobin, (3.17) pyraclostrobin, (3.22) trifloxystrobin, (4.6) fluopicolide, (5.1) bordeaux mixture, (5.4) chlorothalonil, (5.5) copper hydroxide, (5.7) copper oxide, (5.8) copper oxychloride, (5.9) copper(2+) sulfate, (5.16) folpet, (5.23) mancozeb, (5.25) metiram, (5.26) metiram zinc, (5.29) propineb, (5.30) sulphur and sulphur preparations including calcium polysulphide, (7.7) pyrimethanil, (9.2) dimethomorph, (9.4) iprovalicarb, (9.5) mandipropamid, (10.9) propamocarb, (10.10) propamocarb hydrochloride, (12.9) metalaxyl, (12.10) metalaxyl-M (mefenoxam), (14.4) fluazinam, (15.9) cymoxanil, (15.24) fosetyl-aluminium, (15.25) fosetyl-calcium, (15.26) fosetyl-sodium, (15.41) phosphorous acid and its salts, (15.42) propamocarb-fosetylate, (15.54) 1-(4-{4-[(5R)-5-(2,6-difluorophenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)-2-[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]ethanone, (15.55) 1-(4-{4-[(5S)-5-(2,6-difluorophenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)-2-[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]ethanone, (15.56) 1-(4-{4-[5-(2,6-difluorophenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)-2-[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]ethanone, (15.60) 2,6-dimethyl-1H,5H-[1,4]dithiino[2,3-c:5,6-c']dipyrrole-1,3,5,7(2H,6H)-tetrone, (15.90) pentyl {6-[({[(1-methyl-1H-tetrazol-5-yl)(phenyl)methylidene]amino}oxy)methyl]pyridin-2-yl}carbamate.

All named mixing partners of the classes (1) to (15) can, if their functional groups enable this, optionally form salts with suitable bases or acids.

In a preferred embodiment this invention is directed to mixtures comprising the compound (I-1) as compound of formula (I) and one component (B), in particular the mixtures (I-1) + (1.1), (I-1) + (1.2), (I-1) + (1.3), (I-1) + (1.4), (I-1) + (1.5), (I-1) + (1.6), (I-1) + (1.7), (I-1) + (1.8), (I-1) + (1.9), (I-1) + (1.10), (I-1) + (1.11), (I-1) + (1.12), (I-1) + (1.13), (I-1) + (1.14), (I-1) + (1.15), (I-1) + (1.16), (I-1) + (1.17), (I-1) + (1.18), (I-1) + (1.19), (I-1) + (1.20), (I-1) + (1.21), (I-1) + (1.22), (I-1) + (1.23), (I-1) + (1.24), (I-1) + (1.25), (I-1) + (1.26), (I-1) + (1.27), (I-1) + (1.28), (I-1) + (1.29), (I-1) + (1.30), (I-1) + (1.31), (I-1) + (1.32),

(I-1) + (1.33), (I-1) + (1.34), (I-1) + (1.35), (I-1) + (1.36), (I-1) + (1.37), (I-1) + (1.38), (I-1) + (1.39), (I-1) + (1.40), (I-1) + (1.41), (I-1) + (1.42), (I-1) + (1.43), (I-1) + (1.44), (I-1) + (1.45), (I-1) + (1.46), (I-1) + (1.47), (I-1) + (1.48), (I-1) + (1.49), (I-1) + (1.50), (I-1) + (1.51), (I-1) + (1.52), (I-1) + (1.53), (I-1) + (1.54), (I-1) + (1.55), (I-1) + (1.56), (I-1) + (1.57), (I-1) + (1.58), (I-1) + (1.59), (I-1) + (1.60), (I-1) + (1.61), (I-1) + (1.62), (I-1) + (1.63), (I-1) + (1.64), (I-1) + (2.1), (I-1) + (2.2), (I-1) + (2.3), (I-1) + (2.4), (I-1) + (2.5), (I-1) + (2.6), (I-1) + (2.7), (I-1) + (2.8), (I-1) + (2.9), (I-1) + (2.10), (I-1) + (2.11), (I-1) + (2.12), (I-1) + (2.13), (I-1) + (2.14), (I-1) + (2.15), (I-1) + (2.16), (I-1) + (2.17), (I-1) + (2.18), (I-1) + (2.19), (I-1) + (2.20), (I-1) + (2.21), (I-1) + (2.22), (I-1) + (2.23), (I-1) + (2.24), (I-1) + (2.25), (I-1) + (2.26), (I-1) + (2.27), (I-1) + (2.28), (I-1) + (2.29), (I-1) + (3.1), (I-1) + (3.2), (I-1) + (3.3), (I-1) + (3.4), (I-1) + (3.5), (I-1) + (3.6), (I-1) + (3.7), (I-1) + (3.8), (I-1) + (3.9), (I-1) + (3.10), (I-1) + (3.11), (I-1) + (3.12), (I-1) + (3.13), (I-1) + (3.14), (I-1) + (3.15), (I-1) + (3.16), (I-1) + (3.17), (I-1) + (3.18), (I-1) + (3.19), (I-1) + (3.20), (I-1) + (3.21), (I-1) + (3.22), (I-1) + (3.23), (I-1) + (3.24), (I-1) + (3.25), (I-1) + (3.26), (I-1) + (3.27), (I-1) + (3.28), (I-1) + (3.29), (I-1) + (3.30), (I-1) + (3.31), (I-1) + (3.32), (I-1) + (3.33), (I-1) + (4.1), (I-1) + (4.2), (I-1) + (4.3), (I-1) + (4.4), (I-1) + (4.5), (I-1) + (4.6), (I-1) + (4.7), (I-1) + (4.8), (I-1) + (4.9), (I-1) + (4.10), (I-1) + (4.11), (I-1) + (4.12), (I-1) + (4.13), (I-1) + (4.14), (I-1) + (5.1), (I-1) + (5.2), (I-1) + (5.3), (I-1) + (5.4), (I-1) + (5.5), (I-1) + (5.6), (I-1) + (5.7), (I-1) + (5.8), (I-1) + (5.9), (I-1) + (5.10), (I-1) + (5.11), (I-1) + (5.12), (I-1) + (5.13), (I-1) + (5.14), (I-1) + (5.15), (I-1) + (5.16), (I-1) + (5.17), (I-1) + (5.18), (I-1) + (5.19), (I-1) + (5.20), (I-1) + (5.21), (I-1) + (5.22), (I-1) + (5.23), (I-1) + (5.24), (I-1) + (5.25), (I-1) + (5.26), (I-1) + (5.27), (I-1) + (5.28), (I-1) + (5.29), (I-1) + (5.30), (I-1) + (5.31), (I-1) + (5.32), (I-1) + (5.33), (I-1) + (5.34), (I-1) + (6.1), (I-1) + (6.2), (I-1) + (6.3), (I-1) + (6.4), (I-1) + (7.1), (I-1) + (7.2), (I-1) + (7.3), (I-1) + (7.4), (I-1) + (7.5), (I-1) + (7.6), (I-1) + (7.7), (I-1) + (7.8), (I-1) + (8.1), (I-1) + (8.2), (I-1) + (8.3), (I-1) + (8.4), (I-1) + (9.1), (I-1) + (9.2), (I-1) + (9.3), (I-1) + (9.4), (I-1) + (9.5), (I-1) + (9.6), (I-1) + (9.7), (I-1) + (9.8), (I-1) + (9.9), (I-1) + (10.1), (I-1) + (10.2), (I-1) + (10.3), (I-1) + (10.4), (I-1) + (10.5), (I-1) + (10.6), (I-1) + (10.7), (I-1) + (10.8), (I-1) + (10.9), (I-1) + (10.10), (I-1) + (10.11), (I-1) + (10.12), (I-1) + (10.13), (I-1) + (10.14), (I-1) + (10.15), (I-1) + (11.1), (I-1) + (11.2), (I-1) + (11.3), (I-1) + (11.4), (I-1) + (11.5), (I-1) + (11.6), (I-1) + (11.7), (I-1) + (12.1), (I-1) + (12.2), (I-1) + (12.3), (I-1) + (12.4), (I-1) + (12.5), (I-1) + (12.6), (I-1) + (12.7), (I-1) + (12.8), (I-1) + (12.9), (I-1) + (12.10), (I-1) + (12.11), (I-1) + (12.12), (I-1) + (12.13), (I-1) + (13.1), (I-1) + (13.2), (I-1) + (13.3), (I-1) + (13.4), (I-1) + (13.5), (I-1) + (13.6), (I-1) + (13.7), (I-1) + (14.1), (I-1) + (14.2), (I-1) + (14.3), (I-1) + (14.4), (I-1) + (14.5), (I-1) + (15.1), (I-1) + (15.2), (I-1) + (15.3), (I-1) + (15.4), (I-1) + (15.5), (I-1) + (15.6), (I-1) + (15.7), (I-1) + (15.8), (I-1) + (15.9), (I-1) + (15.10), (I-1) + (15.11), (I-1) + (15.12), (I-1) + (15.13), (I-1) + (15.14), (I-1) + (15.15), (I-1) + (15.16), (I-1) + (15.17), (I-1) + (15.18), (I-1) + (15.19), (I-1) + (15.20), (I-1) + (15.21), (I-1) + (15.22), (I-1) + (15.23), (I-1) + (15.24), (I-1) + (15.25), (I-1) + (15.26), (I-1) + (15.27), (I-1) + (15.28), (I-1) + (15.29), (I-1) + (15.30), (I-1) + (15.31), (I-1) + (15.32), (I-1) + (15.33), (I-1) + (15.34), (I-1) + (15.35), (I-1) + (15.36), (I-1) + (15.37), (I-1) + (15.38), (I-1) + (15.39), (I-1) + (15.41), (I-1) + (15.42), (I-1) + (15.43), (I-1) + (15.44), (I-1) + (15.45), (I-1) + (15.46), (I-1) + (15.47), (I-1) + (15.48), (I-1) + (15.49),

(I-1) + (15.50), (I-1) + (15.51), (I-1) + (15.52), (I-1) + (15.53), (I-1) + (15.54), (I-1) + (15.55), (I-1) + (15.56), (I-1) + (15.57), (I-1) + (15.58), (I-1) + (15.59), (I-1) + (15.60), (I-1) + (15.61), (I-1) + (15.62), (I-1) + (15.63), (I-1) + (15.64), (I-1) + (15.65), (I-1) + (15.66), (I-1) + (15.67), (I-1) + (15.68), (I-1) + (15.69), (I-1) + (15.70), (I-1) + (15.71), (I-1) + (15.72), (I-1) + (15.73), (I-1) + (15.74), (I-1) + (15.75), (I-1) + (15.76), (I-1) + (15.77), (I-1) + (15.78), (I-1) + (15.79), (I-1) + (15.80), (I-1) + (15.81), (I-1) + (15.82), (I-1) + (15.83), (I-1) + (15.84), (I-1) + (15.85), (I-1) + (15.86), (I-1) + (15.87), (I-1) + (15.88), (I-1) + (15.89), (I-1) + (15.90), (I-1) + (15.91), (I-1) + (15.92), (I-1) + (15.93), (I-1) + (15.94).

In a further particularly preferred embodiment this invention is directed to mixtures comprising the compound (I-1) as compound of formula (I) and one component (B), in particular the mixtures (I-1) + (2.1), (I-1) + (2.2), (I-1) + (2.6), (I-1) + (2.8), (I-1) + (2.11), (I-1) + (2.12), (I-1) + (2.13), (I-1) + (2.14), (I-1) + (2.15), (I-1) + (2.16), (I-1) + (2.17), (I-1) + (2.29), (I-1) + (3.1), (I-1) + (3.2), (I-1) + (3.3), (I-1) + (3.4), (I-1) + (3.9), (I-1) + (3.10), (I-1) + (3.12), (I-1) + (3.16), (I-1) + (3.17), (I-1) + (3.22), (I-1) + (4.6), (I-1) + (5.1), (I-1) + (5.4), (I-1) + (5.5), (I-1) + (5.7), (I-1) + (5.8), (I-1) + (5.9), (I-1) + (5.16), (I-1) + (5.23), (I-1) + (5.25), (I-1) + (5.26), (I-1) + (5.29), (I-1) + (5.30), (I-1) + (7.7), (I-1) + (9.2), (I-1) + (9.4), (I-1) + (9.5), (I-1) + (10.9), (I-1) + (10.10), (I-1) + (12.9), (I-1) + (12.10), (I-1) + (14.4), (I-1) + (15.9), (I-1) + (15.24), (I-1) + (15.25), (I-1) + (15.26), (I-1) + (15.41), (I-1) + (15.42), (I-1) + (15.54), (I-1) + (15.55), (I-1) + (15.56), (I-1) + (15.60), (I-1) + (15.90).

In a preferred embodiment this invention is directed to mixtures comprising the compound (I-2) as compound of formula (I) and one component (B), in particular the mixtures (I-2) + (1.1), (I-2) + (1.2), (I-2) + (1.3), (I-2) + (1.4), (I-2) + (1.5), (I-2) + (1.6), (I-2) + (1.7), (I-2) + (1.8), (I-2) + (1.9), (I-2) + (1.10), (I-2) + (1.11), (I-2) + (1.12), (I-2) + (1.13), (I-2) + (1.14), (I-2) + (1.15), (I-2) + (1.16), (I-2) + (1.17), (I-2) + (1.18), (I-2) + (1.19), (I-2) + (1.20), (I-2) + (1.21), (I-2) + (1.22), (I-2) + (1.23), (I-2) + (1.24), (I-2) + (1.25), (I-2) + (1.26), (I-2) + (1.27), (I-2) + (1.28), (I-2) + (1.29), (I-2) + (1.30), (I-2) + (1.31), (I-2) + (1.32), (I-2) + (1.33), (I-2) + (1.34), (I-2) + (1.35), (I-2) + (1.36), (I-2) + (1.37), (I-2) + (1.38), (I-2) + (1.39), (I-2) + (1.40), (I-2) + (1.41), (I-2) + (1.42), (I-2) + (1.43), (I-2) + (1.44), (I-2) + (1.45), (I-2) + (1.46), (I-2) + (1.47), (I-2) + (1.48), (I-2) + (1.49), (I-2) + (1.50), (I-2) + (1.51), (I-2) + (1.52), (I-2) + (1.53), (I-2) + (1.54), (I-2) + (1.55), (I-2) + (1.56), (I-2) + (1.57), (I-2) + (1.58), (I-2) + (1.59), (I-2) + (1.60), (I-2) + (1.61), (I-2) + (1.62), (I-2) + (1.63), (I-2) + (1.64), (I-2) + (2.1), (I-2) + (2.2), (I-2) + (2.3), (I-2) + (2.4), (I-2) + (2.5), (I-2) + (2.6), (I-2) + (2.7), (I-2) + (2.8), (I-2) + (2.9), (I-2) + (2.10), (I-2) + (2.11), (I-2) + (2.12), (I-2) + (2.13), (I-2) + (2.14), (I-2) + (2.15), (I-2) + (2.16), (I-2) + (2.17), (I-2) + (2.18), (I-2) + (2.19), (I-2) + (2.20), (I-2) + (2.21), (I-2) + (2.22), (I-2) + (2.23), (I-2) + (2.24), (I-2) + (2.25), (I-2) + (2.26), (I-2) + (2.27), (I-2) + (2.28), (I-2) + (2.29), (I-2) + (3.1), (I-2) + (3.2), (I-2) + (3.3), (I-2) + (3.4), (I-2) + (3.5), (I-2) + (3.6), (I-2) + (3.7), (I-2) + (3.8), (I-2) + (3.9), (I-2) + (3.10), (I-2) + (3.11), (I-2) + (3.12), (I-2) + (3.13), (I-2) + (3.14), (I-2) + (3.15), (I-2) + (3.16), (I-2) + (3.17), (I-2) + (3.18), (I-2) + (3.19), (I-2) + (3.20), (I-2) + (3.21), (I-2) + (3.22), (I-2) + (3.23), (I-2) + (3.24), (I-2) + (3.25), (I-2) + (3.26), (I-2) + (3.27), (I-

2) + (3.28), (I-2) + (3.29), (I-2) + (3.30), (I-2) + (3.31), (I-2) + (3.32), (I-2) + (3.33), (I-2) + (4.1), (I-2) + (4.2), (I-2) + (4.3), (I-2) + (4.4), (I-2) + (4.5), (I-2) + (4.6), (I-2) + (4.7), (I-2) + (4.8), (I-2) + (4.9), (I-2) + (4.10), (I-2) + (4.11), (I-2) + (4.12), (I-2) + (4.13), (I-2) + (4.14), (I-2) + (5.1), (I-2) + (5.2), (I-2) + (5.3), (I-2) + (5.4), (I-2) + (5.5), (I-2) + (5.6), (I-2) + (5.7), (I-2) + (5.8), (I-2) + (5.9), (I-2) + (5.10), (I-2) + (5.11), (I-2) + (5.12), (I-2) + (5.13), (I-2) + (5.14), (I-2) + (5.15), (I-2) + (5.16), (I-2) + (5.17), (I-2) + (5.18), (I-2) + (5.19), (I-2) + (5.20), (I-2) + (5.21), (I-2) + (5.22), (I-2) + (5.23), (I-2) + (5.24), (I-2) + (5.25), (I-2) + (5.26), (I-2) + (5.27), (I-2) + (5.28), (I-2) + (5.29), (I-2) + (5.30), (I-2) + (5.31), (I-2) + (5.32), (I-2) + (5.33), (I-2) + (5.34), (I-2) + (6.1), (I-2) + (6.2), (I-2) + (6.3), (I-2) + (6.4), (I-2) + (7.1), (I-2) + (7.2), (I-2) + (7.3), (I-2) + (7.4), (I-2) + (7.5), (I-2) + (7.6), (I-2) + (7.7), (I-2) + (7.8), (I-2) + (8.1), (I-2) + (8.2), (I-2) + (8.3), (I-2) + (8.4), (I-2) + (9.1), (I-2) + (9.2), (I-2) + (9.3), (I-2) + (9.4), (I-2) + (9.5), (I-2) + (9.6), (I-2) + (9.7), (I-2) + (9.8), (I-2) + (9.9), (I-2) + (10.1), (I-2) + (10.2), (I-2) + (10.3), (I-2) + (10.4), (I-2) + (10.5), (I-2) + (10.6), (I-2) + (10.7), (I-2) + (10.8), (I-2) + (10.9), (I-2) + (10.10), (I-2) + (10.11), (I-2) + (10.12), (I-2) + (10.13), (I-2) + (10.14), (I-2) + (10.15), (I-2) + (11.1), (I-2) + (11.2), (I-2) + (11.3), (I-2) + (11.4), (I-2) + (11.5), (I-2) + (11.6), (I-2) + (11.7), (I-2) + (12.1), (I-2) + (12.2), (I-2) + (12.3), (I-2) + (12.4), (I-2) + (12.5), (I-2) + (12.6), (I-2) + (12.7), (I-2) + (12.8), (I-2) + (12.9), (I-2) + (12.10), (I-2) + (12.11), (I-2) + (12.12), (I-2) + (12.13), (I-2) + (13.1), (I-2) + (13.2), (I-2) + (13.3), (I-2) + (13.4), (I-2) + (13.5), (I-2) + (13.6), (I-2) + (13.7), (I-2) + (14.1), (I-2) + (14.2), (I-2) + (14.3), (I-2) + (14.4), (I-2) + (14.5), (I-2) + (15.1), (I-2) + (15.2), (I-2) + (15.3), (I-2) + (15.4), (I-2) + (15.5), (I-2) + (15.6), (I-2) + (15.7), (I-2) + (15.8), (I-2) + (15.9), (I-2) + (15.10), (I-2) + (15.11), (I-2) + (15.12), (I-2) + (15.13), (I-2) + (15.14), (I-2) + (15.15), (I-2) + (15.16), (I-2) + (15.17), (I-2) + (15.18), (I-2) + (15.19), (I-2) + (15.20), (I-2) + (15.21), (I-2) + (15.22), (I-2) + (15.23), (I-2) + (15.24), (I-2) + (15.25), (I-2) + (15.26), (I-2) + (15.27), (I-2) + (15.28), (I-2) + (15.29), (I-2) + (15.30), (I-2) + (15.31), (I-2) + (15.32), (I-2) + (15.33), (I-2) + (15.34), (I-2) + (15.35), (I-2) + (15.36), (I-2) + (15.37), (I-2) + (15.38), (I-2) + (15.39), (I-2) + (15.41), (I-2) + (15.42), (I-2) + (15.43), (I-2) + (15.44), (I-2) + (15.45), (I-2) + (15.46), (I-2) + (15.47), (I-2) + (15.48), (I-2) + (15.49), (I-2) + (15.50), (I-2) + (15.51), (I-2) + (15.52), (I-2) + (15.53), (I-2) + (15.54), (I-2) + (15.55), (I-2) + (15.56), (I-2) + (15.57), (I-2) + (15.58), (I-2) + (15.59), (I-2) + (15.60), (I-2) + (15.61), (I-2) + (15.62), (I-2) + (15.63), (I-2) + (15.64), (I-2) + (15.65), (I-2) + (15.66), (I-2) + (15.67), (I-2) + (15.68), (I-2) + (15.69), (I-2) + (15.70), (I-2) + (15.71), (I-2) + (15.72), (I-2) + (15.73), (I-2) + (15.74), (I-2) + (15.75), (I-2) + (15.76), (I-2) + (15.77), (I-2) + (15.78), (I-2) + (15.79), (I-2) + (15.80), (I-2) + (15.81), (I-2) + (15.82), (I-2) + (15.83), (I-2) + (15.84), (I-2) + (15.85), (I-2) + (15.86), (I-2) + (15.87), (I-2) + (15.88), (I-2) + (15.89), (I-2) + (15.90), (I-2) + (15.91), (I-2) + (15.92), (I-2) + (15.93), (I-2) + (15.94).

In a further particularly preferred embodiment this invention is directed to mixtures comprising the compound (I-2) as compound of formula (I) and one component (B), in particular the mixtures (I-2) + (2.1), (I-2) + (2.2), (I-2) + (2.6), (I-2) + (2.8), (I-2) + (2.11), (I-2) + (2.12), (I-2) + (2.13), (I-2) + (2.14), (I-2) + (2.15), (I-2) + (2.16), (I-2) + (2.17), (I-2) + (2.29), (I-2) + (3.1), (I-2) + (3.2), (I-2) + (3.3), (I-2) + (3.4), (I-2) + (3.9), (I-

2) + (3.10), (I-2) + (3.12), (I-2) + (3.16), (I-2) + (3.17), (I-2) + (3.22), (I-2) + (4.6), (I-2) + (5.1), (I-2) + (5.4), (I-2) + (5.5), (I-2) + (5.7), (I-2) + (5.8), (I-2) + (5.9), (I-2) + (5.16), (I-2) + (5.23), (I-2) + (5.25), (I-2) + (5.26), (I-2) + (5.29), (I-2) + (5.30), (I-2) + (7.7), (I-2) + (9.2), (I-2) + (9.4), (I-2) + (9.5), (I-2) + (10.9), (I-2) + (10.10), (I-2) + (12.9), (I-2) + (12.10), (I-2) + (14.4), (I-2) + (15.9), (I-2) + (15.24), (I-2) + (15.25), (I-2) + (15.26), (I-2) + (15.41), (I-2) + (15.42), (I-2) + (15.54), (I-2) + (15.55), (I-2) + (15.56), (I-2) + (15.60), (I-2) + (15.90).

In a preferred embodiment this invention is directed to mixtures comprising the compound (I-3) as compound of formula (I) and one component (B), in particular the mixtures (I-3) + (1.1), (I-3) + (1.2), (I-3) + (1.3), (I-3) + (1.4), (I-3) + (1.5), (I-3) + (1.6), (I-3) + (1.7), (I-3) + (1.8), (I-3) + (1.9), (I-3) + (1.10), (I-3) + (1.11), (I-3) + (1.12), (I-3) + (1.13), (I-3) + (1.14), (I-3) + (1.15), (I-3) + (1.16), (I-3) + (1.17), (I-3) + (1.18), (I-3) + (1.19), (I-3) + (1.20), (I-3) + (1.21), (I-3) + (1.22), (I-3) + (1.23), (I-3) + (1.24), (I-3) + (1.25), (I-3) + (1.26), (I-3) + (1.27), (I-3) + (1.28), (I-3) + (1.29), (I-3) + (1.30), (I-3) + (1.31), (I-3) + (1.32), (I-3) + (1.33), (I-3) + (1.34), (I-3) + (1.35), (I-3) + (1.36), (I-3) + (1.37), (I-3) + (1.38), (I-3) + (1.39), (I-3) + (1.40), (I-3) + (1.41), (I-3) + (1.42), (I-3) + (1.43), (I-3) + (1.44), (I-3) + (1.45), (I-3) + (1.46), (I-3) + (1.47), (I-3) + (1.48), (I-3) + (1.49), (I-3) + (1.50), (I-3) + (1.51), (I-3) + (1.52), (I-3) + (1.53), (I-3) + (1.54), (I-3) + (1.55), (I-3) + (1.56), (I-3) + (1.57), (I-3) + (1.58), (I-3) + (1.59), (I-3) + (1.60), (I-3) + (1.61), (I-3) + (1.62), (I-3) + (1.63), (I-3) + (1.64), (I-3) + (2.1), (I-3) + (2.2), (I-3) + (2.3), (I-3) + (2.4), (I-3) + (2.5), (I-3) + (2.6), (I-3) + (2.7), (I-3) + (2.8), (I-3) + (2.9), (I-3) + (2.10), (I-3) + (2.11), (I-3) + (2.12), (I-3) + (2.13), (I-3) + (2.14), (I-3) + (2.15), (I-3) + (2.16), (I-3) + (2.17), (I-3) + (2.18), (I-3) + (2.19), (I-3) + (2.20), (I-3) + (2.21), (I-3) + (2.22), (I-3) + (2.23), (I-3) + (2.24), (I-3) + (2.25), (I-3) + (2.26), (I-3) + (2.27), (I-3) + (2.28), (I-3) + (2.29), (I-3) + (3.1), (I-3) + (3.2), (I-3) + (3.3), (I-3) + (3.4), (I-3) + (3.5), (I-3) + (3.6), (I-3) + (3.7), (I-3) + (3.8), (I-3) + (3.9), (I-3) + (3.10), (I-3) + (3.11), (I-3) + (3.12), (I-3) + (3.13), (I-3) + (3.14), (I-3) + (3.15), (I-3) + (3.16), (I-3) + (3.17), (I-3) + (3.18), (I-3) + (3.19), (I-3) + (3.20), (I-3) + (3.21), (I-3) + (3.22), (I-3) + (3.23), (I-3) + (3.24), (I-3) + (3.25), (I-3) + (3.26), (I-3) + (3.27), (I-3) + (3.28), (I-3) + (3.29), (I-3) + (3.30), (I-3) + (3.31), (I-3) + (3.32), (I-3) + (3.33), (I-3) + (4.1), (I-3) + (4.2), (I-3) + (4.3), (I-3) + (4.4), (I-3) + (4.5), (I-3) + (4.6), (I-3) + (4.7), (I-3) + (4.8), (I-3) + (4.9), (I-3) + (4.10), (I-3) + (4.11), (I-3) + (4.12), (I-3) + (4.13), (I-3) + (4.14), (I-3) + (5.1), (I-3) + (5.2), (I-3) + (5.3), (I-3) + (5.4), (I-3) + (5.5), (I-3) + (5.6), (I-3) + (5.7), (I-3) + (5.8), (I-3) + (5.9), (I-3) + (5.10), (I-3) + (5.11), (I-3) + (5.12), (I-3) + (5.13), (I-3) + (5.14), (I-3) + (5.15), (I-3) + (5.16), (I-3) + (5.17), (I-3) + (5.18), (I-3) + (5.19), (I-3) + (5.20), (I-3) + (5.21), (I-3) + (5.22), (I-3) + (5.23), (I-3) + (5.24), (I-3) + (5.25), (I-3) + (5.26), (I-3) + (5.27), (I-3) + (5.28), (I-3) + (5.29), (I-3) + (5.30), (I-3) + (5.31), (I-3) + (5.32), (I-3) + (5.33), (I-3) + (5.34), (I-3) + (6.1), (I-3) + (6.2), (I-3) + (6.3), (I-3) + (6.4), (I-3) + (7.1), (I-3) + (7.2), (I-3) + (7.3), (I-3) + (7.4), (I-3) + (7.5), (I-3) + (7.6), (I-3) + (7.7), (I-3) + (7.8), (I-3) + (8.1), (I-3) + (8.2), (I-3) + (8.3), (I-3) + (8.4), (I-3) + (9.1), (I-3) + (9.2), (I-3) + (9.3), (I-3) + (9.4), (I-3) + (9.5), (I-3) + (9.6), (I-3) + (9.7), (I-3) + (9.8), (I-3) + (9.9), (I-3) + (10.1), (I-3) + (10.2), (I-3) + (10.3), (I-3) + (10.4), (I-3) + (10.5), (I-3) + (10.6),

(I-3) + (10.7), (I-3) + (10.8), (I-3) + (10.9), (I-3) + (10.10), (I-3) + (10.11), (I-3) + (10.12), (I-3) + (10.13), (I-3) + (10.14), (I-3) + (10.15), (I-3) + (11.1), (I-3) + (11.2), (I-3) + (11.3), (I-3) + (11.4), (I-3) + (11.5), (I-3) + (11.6), (I-3) + (11.7), (I-3) + (12.1), (I-3) + (12.2), (I-3) + (12.3), (I-3) + (12.4), (I-3) + (12.5), (I-3) + (12.6), (I-3) + (12.7), (I-3) + (12.8), (I-3) + (12.9), (I-3) + (12.10), (I-3) + (12.11), (I-3) + (12.12), (I-3) + (12.13), (I-3) + (13.1), (I-3) + (13.2), (I-3) + (13.3), (I-3) + (13.4), (I-3) + (13.5), (I-3) + (13.6), (I-3) + (13.7), (I-3) + (14.1), (I-3) + (14.2), (I-3) + (14.3), (I-3) + (14.4), (I-3) + (14.5), (I-3) + (15.1), (I-3) + (15.2), (I-3) + (15.3), (I-3) + (15.4), (I-3) + (15.5), (I-3) + (15.6), (I-3) + (15.7), (I-3) + (15.8), (I-3) + (15.9), (I-3) + (15.10), (I-3) + (15.11), (I-3) + (15.12), (I-3) + (15.13), (I-3) + (15.14), (I-3) + (15.15), (I-3) + (15.16), (I-3) + (15.17), (I-3) + (15.18), (I-3) + (15.19), (I-3) + (15.20), (I-3) + (15.21), (I-3) + (15.22), (I-3) + (15.23), (I-3) + (15.24), (I-3) + (15.25), (I-3) + (15.26), (I-3) + (15.27), (I-3) + (15.28), (I-3) + (15.29), (I-3) + (15.30), (I-3) + (15.31), (I-3) + (15.32), (I-3) + (15.33), (I-3) + (15.34), (I-3) + (15.35), (I-3) + (15.36), (I-3) + (15.37), (I-3) + (15.38), (I-3) + (15.39), (I-3) + (15.41), (I-3) + (15.42), (I-3) + (15.43), (I-3) + (15.44), (I-3) + (15.45), (I-3) + (15.46), (I-3) + (15.47), (I-3) + (15.48), (I-3) + (15.49), (I-3) + (15.50), (I-3) + (15.51), (I-3) + (15.52), (I-3) + (15.53), (I-3) + (15.54), (I-3) + (15.55), (I-3) + (15.56), (I-3) + (15.57), (I-3) + (15.58), (I-3) + (15.59), (I-3) + (15.60), (I-3) + (15.61), (I-3) + (15.62), (I-3) + (15.63), (I-3) + (15.64), (I-3) + (15.65), (I-3) + (15.66), (I-3) + (15.67), (I-3) + (15.68), (I-3) + (15.69), (I-3) + (15.70), (I-3) + (15.71), (I-3) + (15.72), (I-3) + (15.73), (I-3) + (15.74), (I-3) + (15.75), (I-3) + (15.76), (I-3) + (15.77), (I-3) + (15.78), (I-3) + (15.79), (I-3) + (15.80), (I-3) + (15.81), (I-3) + (15.82), (I-3) + (15.83), (I-3) + (15.84), (I-3) + (15.85), (I-3) + (15.86), (I-3) + (15.87), (I-3) + (15.88), (I-3) + (15.89), (I-3) + (15.90), (I-3) + (15.91), (I-3) + (15.92), (I-3) + (15.93), (I-3) + (15.94).

In a further particularly preferred embodiment this invention is directed to mixtures comprising the compound (I-3) as compound of formula (I) and one component (B), in particular the mixtures (I-3) + (2.1), (I-3) + (2.2), (I-3) + (2.6), (I-3) + (2.8), (I-3) + (2.11), (I-3) + (2.12), (I-3) + (2.13), (I-3) + (2.14), (I-3) + (2.15), (I-3) + (2.16), (I-3) + (2.17), (I-3) + (2.29), (I-3) + (3.1), (I-3) + (3.2), (I-3) + (3.3), (I-3) + (3.4), (I-3) + (3.9), (I-3) + (3.10), (I-3) + (3.12), (I-3) + (3.16), (I-3) + (3.17), (I-3) + (3.22), (I-3) + (4.6), (I-3) + (5.1), (I-3) + (5.4), (I-3) + (5.5), (I-3) + (5.7), (I-3) + (5.8), (I-3) + (5.9), (I-3) + (5.16), (I-3) + (5.23), (I-3) + (5.25), (I-3) + (5.26), (I-3) + (5.29), (I-3) + (5.30), (I-3) + (7.7), (I-3) + (9.2), (I-3) + (9.4), (I-3) + (9.5), (I-3) + (10.9), (I-3) + (10.10), (I-3) + (12.9), (I-3) + (12.10), (I-3) + (14.4), (I-3) + (15.9), (I-3) + (15.24), (I-3) + (15.25), (I-3) + (15.26), (I-3) + (15.41), (I-3) + (15.42), (I-3) + (15.54), (I-3) + (15.55), (I-3) + (15.56), (I-3) + (15.60), (I-3) + (15.90).

In a preferred embodiment this invention is directed to mixtures comprising the compound (I-4) as compound of formula (I) and one component (B), in particular the mixtures (I-4) + (1.1), (I-4) + (1.2), (I-4) + (1.3), (I-4) + (1.4), (I-4) + (1.5), (I-4) + (1.6), (I-4) + (1.7), (I-4) + (1.8), (I-4) + (1.9), (I-4) + (1.10), (I-4) + (1.11), (I-4) + (1.12), (I-4) + (1.13), (I-4) + (1.14), (I-4) + (1.15), (I-4) + (1.16), (I-4) + (1.17), (I-4) + (1.18), (I-4) + (1.19), (I-4) + (1.20), (I-4) + (1.21), (I-4) + (1.22), (I-4) + (1.23), (I-4) + (1.24), (I-4) + (1.25), (I-

4) + (1.26), (I-4) + (1.27), (I-4) + (1.28), (I-4) + (1.29), (I-4) + (1.30), (I-4) + (1.31), (I-4) + (1.32), (I-4) + (1.33), (I-4) + (1.34), (I-4) + (1.35), (I-4) + (1.36), (I-4) + (1.37), (I-4) + (1.38), (I-4) + (1.39), (I-4) + (1.40), (I-4) + (1.41), (I-4) + (1.42), (I-4) + (1.43), (I-4) + (1.44), (I-4) + (1.45), (I-4) + (1.46), (I-4) + (1.47), (I-4) + (1.48), (I-4) + (1.49), (I-4) + (1.50), (I-4) + (1.51), (I-4) + (1.52), (I-4) + (1.53), (I-4) + (1.54), (I-4) + (1.55), (I-4) + (1.56), (I-4) + (1.57), (I-4) + (1.58), (I-4) + (1.59), (I-4) + (1.60), (I-4) + (1.61), (I-4) + (1.62), (I-4) + (1.63), (I-4) + (1.64), (I-4) + (2.1), (I-4) + (2.2), (I-4) + (2.3), (I-4) + (2.4), (I-4) + (2.5), (I-4) + (2.6), (I-4) + (2.7), (I-4) + (2.8), (I-4) + (2.9), (I-4) + (2.10), (I-4) + (2.11), (I-4) + (2.12), (I-4) + (2.13), (I-4) + (2.14), (I-4) + (2.15), (I-4) + (2.16), (I-4) + (2.17), (I-4) + (2.18), (I-4) + (2.19), (I-4) + (2.20), (I-4) + (2.21), (I-4) + (2.22), (I-4) + (2.23), (I-4) + (2.24), (I-4) + (2.25), (I-4) + (2.26), (I-4) + (2.27), (I-4) + (2.28), (I-4) + (2.29), (I-4) + (3.1), (I-4) + (3.2), (I-4) + (3.3), (I-4) + (3.4), (I-4) + (3.5), (I-4) + (3.6), (I-4) + (3.7), (I-4) + (3.8), (I-4) + (3.9), (I-4) + (3.10), (I-4) + (3.11), (I-4) + (3.12), (I-4) + (3.13), (I-4) + (3.14), (I-4) + (3.15), (I-4) + (3.16), (I-4) + (3.17), (I-4) + (3.18), (I-4) + (3.19), (I-4) + (3.20), (I-4) + (3.21), (I-4) + (3.22), (I-4) + (3.23), (I-4) + (3.24), (I-4) + (3.25), (I-4) + (3.26), (I-4) + (3.27), (I-4) + (3.28), (I-4) + (3.29), (I-4) + (3.30), (I-4) + (3.31), (I-4) + (3.32), (I-4) + (3.33), (I-4) + (4.1), (I-4) + (4.2), (I-4) + (4.3), (I-4) + (4.4), (I-4) + (4.5), (I-4) + (4.6), (I-4) + (4.7), (I-4) + (4.8), (I-4) + (4.9), (I-4) + (4.10), (I-4) + (4.11), (I-4) + (4.12), (I-4) + (4.13), (I-4) + (4.14), (I-4) + (5.1), (I-4) + (5.2), (I-4) + (5.3), (I-4) + (5.4), (I-4) + (5.5), (I-4) + (5.6), (I-4) + (5.7), (I-4) + (5.8), (I-4) + (5.9), (I-4) + (5.10), (I-4) + (5.11), (I-4) + (5.12), (I-4) + (5.13), (I-4) + (5.14), (I-4) + (5.15), (I-4) + (5.16), (I-4) + (5.17), (I-4) + (5.18), (I-4) + (5.19), (I-4) + (5.20), (I-4) + (5.21), (I-4) + (5.22), (I-4) + (5.23), (I-4) + (5.24), (I-4) + (5.25), (I-4) + (5.26), (I-4) + (5.27), (I-4) + (5.28), (I-4) + (5.29), (I-4) + (5.30), (I-4) + (5.31), (I-4) + (5.32), (I-4) + (5.33), (I-4) + (5.34), (I-4) + (6.1), (I-4) + (6.2), (I-4) + (6.3), (I-4) + (6.4), (I-4) + (7.1), (I-4) + (7.2), (I-4) + (7.3), (I-4) + (7.4), (I-4) + (7.5), (I-4) + (7.6), (I-4) + (7.7), (I-4) + (7.8), (I-4) + (8.1), (I-4) + (8.2), (I-4) + (8.3), (I-4) + (8.4), (I-4) + (9.1), (I-4) + (9.2), (I-4) + (9.3), (I-4) + (9.4), (I-4) + (9.5), (I-4) + (9.6), (I-4) + (9.7), (I-4) + (9.8), (I-4) + (9.9), (I-4) + (10.1), (I-4) + (10.2), (I-4) + (10.3), (I-4) + (10.4), (I-4) + (10.5), (I-4) + (10.6), (I-4) + (10.7), (I-4) + (10.8), (I-4) + (10.9), (I-4) + (10.10), (I-4) + (10.11), (I-4) + (10.12), (I-4) + (10.13), (I-4) + (10.14), (I-4) + (10.15), (I-4) + (11.1), (I-4) + (11.2), (I-4) + (11.3), (I-4) + (11.4), (I-4) + (11.5), (I-4) + (11.6), (I-4) + (11.7), (I-4) + (12.1), (I-4) + (12.2), (I-4) + (12.3), (I-4) + (12.4), (I-4) + (12.5), (I-4) + (12.6), (I-4) + (12.7), (I-4) + (12.8), (I-4) + (12.9), (I-4) + (12.10), (I-4) + (12.11), (I-4) + (12.12), (I-4) + (12.13), (I-4) + (13.1), (I-4) + (13.2), (I-4) + (13.3), (I-4) + (13.4), (I-4) + (13.5), (I-4) + (13.6), (I-4) + (13.7), (I-4) + (14.1), (I-4) + (14.2), (I-4) + (14.3), (I-4) + (14.4), (I-4) + (14.5), (I-4) + (15.1), (I-4) + (15.2), (I-4) + (15.3), (I-4) + (15.4), (I-4) + (15.5), (I-4) + (15.6), (I-4) + (15.7), (I-4) + (15.8), (I-4) + (15.9), (I-4) + (15.10), (I-4) + (15.11), (I-4) + (15.12), (I-4) + (15.13), (I-4) + (15.14), (I-4) + (15.15), (I-4) + (15.16), (I-4) + (15.17), (I-4) + (15.18), (I-4) + (15.19), (I-4) + (15.20), (I-4) + (15.21), (I-4) + (15.22), (I-4) + (15.23), (I-4) + (15.24), (I-4) + (15.25), (I-4) + (15.26), (I-4) + (15.27), (I-4) + (15.28), (I-4) + (15.29), (I-4) + (15.30), (I-4) + (15.31), (I-4) + (15.32), (I-4) + (15.33), (I-4) + (15.34), (I-4) + (15.35), (I-4) + (15.36), (I-4) + (15.37), (I-4) + (15.38), (I-4) + (15.39), (I-4) + (15.41), (I-4) + (15.42), (I-4) + (15.43), (I-4) + (15.44), (I-

4) + (15.45), (I-4) + (15.46), (I-4) + (15.47), (I-4) + (15.48), (I-4) + (15.49), (I-4) + (15.50), (I-4) + (15.51), (I-4) + (15.52), (I-4) + (15.53), (I-4) + (15.54), (I-4) + (15.55), (I-4) + (15.56), (I-4) + (15.57), (I-4) + (15.58), (I-4) + (15.59), (I-4) + (15.60), (I-4) + (15.61), (I-4) + (15.62), (I-4) + (15.63), (I-4) + (15.64), (I-4) + (15.65), (I-4) + (15.66), (I-4) + (15.67), (I-4) + (15.68), (I-4) + (15.69), (I-4) + (15.70), (I-4) + (15.71), (I-4) + (15.72), (I-4) + (15.73), (I-4) + (15.74), (I-4) + (15.75), (I-4) + (15.76), (I-4) + (15.77), (I-4) + (15.78), (I-4) + (15.79), (I-4) + (15.80), (I-4) + (15.81), (I-4) + (15.82), (I-4) + (15.83), (I-4) + (15.84), (I-4) + (15.85), (I-4) + (15.86), (I-4) + (15.87), (I-4) + (15.88), (I-4) + (15.89), (I-4) + (15.90), (I-4) + (15.91), (I-4) + (15.92), (I-4) + (15.93), (I-4) + (15.94).

In a further particularly preferred embodiment this invention is directed to mixtures comprising the compound (I-4) as compound of formula (I) and one component (B), in particular the mixtures (I-4) + (2.1), (I-4) + (2.2), (I-4) + (2.6), (I-4) + (2.8), (I-4) + (2.11), (I-4) + (2.12), (I-4) + (2.13), (I-4) + (2.14), (I-4) + (2.15), (I-4) + (2.16), (I-4) + (2.17), (I-4) + (2.29), (I-4) + (3.1), (I-4) + (3.2), (I-4) + (3.3), (I-4) + (3.4), (I-4) + (3.9), (I-4) + (3.10), (I-4) + (3.12), (I-4) + (3.16), (I-4) + (3.17), (I-4) + (3.22), (I-4) + (4.6), (I-4) + (5.1), (I-4) + (5.4), (I-4) + (5.5), (I-4) + (5.7), (I-4) + (5.8), (I-4) + (5.9), (I-4) + (5.16), (I-4) + (5.23), (I-4) + (5.25), (I-4) + (5.26), (I-4) + (5.29), (I-4) + (5.30), (I-4) + (7.7), (I-4) + (9.2), (I-4) + (9.4), (I-4) + (9.5), (I-4) + (10.9), (I-4) + (10.10), (I-4) + (12.9), (I-4) + (12.10), (I-4) + (14.4), (I-4) + (15.9), (I-4) + (15.24), (I-4) + (15.25), (I-4) + (15.26), (I-4) + (15.41), (I-4) + (15.42), (I-4) + (15.54), (I-4) + (15.55), (I-4) + (15.56), (I-4) + (15.60), (I-4) + (15.90).

In a preferred embodiment this invention is directed to mixtures comprising the compound (I-5) as compound of formula (I) and one component (B), in particular the mixtures (I-5) + (1.1), (I-5) + (1.2), (I-5) + (1.3), (I-5) + (1.4), (I-5) + (1.5), (I-5) + (1.6), (I-5) + (1.7), (I-5) + (1.8), (I-5) + (1.9), (I-5) + (1.10), (I-5) + (1.11), (I-5) + (1.12), (I-5) + (1.13), (I-5) + (1.14), (I-5) + (1.15), (I-5) + (1.16), (I-5) + (1.17), (I-5) + (1.18), (I-5) + (1.19), (I-5) + (1.20), (I-5) + (1.21), (I-5) + (1.22), (I-5) + (1.23), (I-5) + (1.24), (I-5) + (1.25), (I-5) + (1.26), (I-5) + (1.27), (I-5) + (1.28), (I-5) + (1.29), (I-5) + (1.30), (I-5) + (1.31), (I-5) + (1.32), (I-5) + (1.33), (I-5) + (1.34), (I-5) + (1.35), (I-5) + (1.36), (I-5) + (1.37), (I-5) + (1.38), (I-5) + (1.39), (I-5) + (1.40), (I-5) + (1.41), (I-5) + (1.42), (I-5) + (1.43), (I-5) + (1.44), (I-5) + (1.45), (I-5) + (1.46), (I-5) + (1.47), (I-5) + (1.48), (I-5) + (1.49), (I-5) + (1.50), (I-5) + (1.51), (I-5) + (1.52), (I-5) + (1.53), (I-5) + (1.54), (I-5) + (1.55), (I-5) + (1.56), (I-5) + (1.57), (I-5) + (1.58), (I-5) + (1.59), (I-5) + (1.60), (I-5) + (1.61), (I-5) + (1.62), (I-5) + (1.63), (I-5) + (1.64), (I-5) + (2.1), (I-5) + (2.2), (I-5) + (2.3), (I-5) + (2.4), (I-5) + (2.5), (I-5) + (2.6), (I-5) + (2.7), (I-5) + (2.8), (I-5) + (2.9), (I-5) + (2.10), (I-5) + (2.11), (I-5) + (2.12), (I-5) + (2.13), (I-5) + (2.14), (I-5) + (2.15), (I-5) + (2.16), (I-5) + (2.17), (I-5) + (2.18), (I-5) + (2.19), (I-5) + (2.20), (I-5) + (2.21), (I-5) + (2.22), (I-5) + (2.23), (I-5) + (2.24), (I-5) + (2.25), (I-5) + (2.26), (I-5) + (2.27), (I-5) + (2.28), (I-5) + (2.29), (I-5) + (3.1), (I-5) + (3.2), (I-5) + (3.3), (I-5) + (3.4), (I-5) + (3.5), (I-5) + (3.6), (I-5) + (3.7), (I-5) + (3.8), (I-5) + (3.9), (I-5) + (3.10), (I-5) + (3.11), (I-5) + (3.12), (I-5) + (3.13), (I-5) + (3.14), (I-5) + (3.15), (I-5) + (3.16), (I-5) + (3.17), (I-5) + (3.18), (I-5) + (3.19), (I-5) + (3.20), (I-

5) + (3.21), (I-5) + (3.22), (I-5) + (3.23), (I-5) + (3.24), (I-5) + (3.25), (I-5) + (3.26), (I-5) + (3.27), (I-5) + (3.28), (I-5) + (3.29), (I-5) + (3.30), (I-5) + (3.31), (I-5) + (3.32), (I-5) + (3.33), (I-5) + (4.1), (I-5) + (4.2), (I-5) + (4.3), (I-5) + (4.4), (I-5) + (4.5), (I-5) + (4.6), (I-5) + (4.7), (I-5) + (4.8), (I-5) + (4.9), (I-5) + (4.10), (I-5) + (4.11), (I-5) + (4.12), (I-5) + (4.13), (I-5) + (4.14), (I-5) + (5.1), (I-5) + (5.2), (I-5) + (5.3), (I-5) + (5.4), (I-5) + (5.5), (I-5) + (5.6), (I-5) + (5.7), (I-5) + (5.8), (I-5) + (5.9), (I-5) + (5.10), (I-5) + (5.11), (I-5) + (5.12), (I-5) + (5.13), (I-5) + (5.14), (I-5) + (5.15), (I-5) + (5.16), (I-5) + (5.17), (I-5) + (5.18), (I-5) + (5.19), (I-5) + (5.20), (I-5) + (5.21), (I-5) + (5.22), (I-5) + (5.23), (I-5) + (5.24), (I-5) + (5.25), (I-5) + (5.26), (I-5) + (5.27), (I-5) + (5.28), (I-5) + (5.29), (I-5) + (5.30), (I-5) + (5.31), (I-5) + (5.32), (I-5) + (5.33), (I-5) + (5.34), (I-5) + (6.1), (I-5) + (6.2), (I-5) + (6.3), (I-5) + (6.4), (I-5) + (7.1), (I-5) + (7.2), (I-5) + (7.3), (I-5) + (7.4), (I-5) + (7.5), (I-5) + (7.6), (I-5) + (7.7), (I-5) + (7.8), (I-5) + (8.1), (I-5) + (8.2), (I-5) + (8.3), (I-5) + (8.4), (I-5) + (9.1), (I-5) + (9.2), (I-5) + (9.3), (I-5) + (9.4), (I-5) + (9.5), (I-5) + (9.6), (I-5) + (9.7), (I-5) + (9.8), (I-5) + (9.9), (I-5) + (10.1), (I-5) + (10.2), (I-5) + (10.3), (I-5) + (10.4), (I-5) + (10.5), (I-5) + (10.6), (I-5) + (10.7), (I-5) + (10.8), (I-5) + (10.9), (I-5) + (10.10), (I-5) + (10.11), (I-5) + (10.12), (I-5) + (10.13), (I-5) + (10.14), (I-5) + (10.15), (I-5) + (11.1), (I-5) + (11.2), (I-5) + (11.3), (I-5) + (11.4), (I-5) + (11.5), (I-5) + (11.6), (I-5) + (11.7), (I-5) + (12.1), (I-5) + (12.2), (I-5) + (12.3), (I-5) + (12.4), (I-5) + (12.5), (I-5) + (12.6), (I-5) + (12.7), (I-5) + (12.8), (I-5) + (12.9), (I-5) + (12.10), (I-5) + (12.11), (I-5) + (12.12), (I-5) + (12.13), (I-5) + (13.1), (I-5) + (13.2), (I-5) + (13.3), (I-5) + (13.4), (I-5) + (13.5), (I-5) + (13.6), (I-5) + (13.7), (I-5) + (14.1), (I-5) + (14.2), (I-5) + (14.3), (I-5) + (14.4), (I-5) + (14.5), (I-5) + (15.1), (I-5) + (15.2), (I-5) + (15.3), (I-5) + (15.4), (I-5) + (15.5), (I-5) + (15.6), (I-5) + (15.7), (I-5) + (15.8), (I-5) + (15.9), (I-5) + (15.10), (I-5) + (15.11), (I-5) + (15.12), (I-5) + (15.13), (I-5) + (15.14), (I-5) + (15.15), (I-5) + (15.16), (I-5) + (15.17), (I-5) + (15.18), (I-5) + (15.19), (I-5) + (15.20), (I-5) + (15.21), (I-5) + (15.22), (I-5) + (15.23), (I-5) + (15.24), (I-5) + (15.25), (I-5) + (15.26), (I-5) + (15.27), (I-5) + (15.28), (I-5) + (15.29), (I-5) + (15.30), (I-5) + (15.31), (I-5) + (15.32), (I-5) + (15.33), (I-5) + (15.34), (I-5) + (15.35), (I-5) + (15.36), (I-5) + (15.37), (I-5) + (15.38), (I-5) + (15.39), (I-5) + (15.41), (I-5) + (15.42), (I-5) + (15.43), (I-5) + (15.44), (I-5) + (15.45), (I-5) + (15.46), (I-5) + (15.47), (I-5) + (15.48), (I-5) + (15.49), (I-5) + (15.50), (I-5) + (15.51), (I-5) + (15.52), (I-5) + (15.53), (I-5) + (15.54), (I-5) + (15.55), (I-5) + (15.56), (I-5) + (15.57), (I-5) + (15.58), (I-5) + (15.59), (I-5) + (15.60), (I-5) + (15.61), (I-5) + (15.62), (I-5) + (15.63), (I-5) + (15.64), (I-5) + (15.65), (I-5) + (15.66), (I-5) + (15.67), (I-5) + (15.68), (I-5) + (15.69), (I-5) + (15.70), (I-5) + (15.71), (I-5) + (15.72), (I-5) + (15.73), (I-5) + (15.74), (I-5) + (15.75), (I-5) + (15.76), (I-5) + (15.77), (I-5) + (15.78), (I-5) + (15.79), (I-5) + (15.80), (I-5) + (15.81), (I-5) + (15.82), (I-5) + (15.83), (I-5) + (15.84), (I-5) + (15.85), (I-5) + (15.86), (I-5) + (15.87), (I-5) + (15.88), (I-5) + (15.89), (I-5) + (15.90), (I-5) + (15.91), (I-5) + (15.92), (I-5) + (15.93), (I-5) + (15.94).

In a further particularly preferred embodiment this invention is directed to mixtures comprising the compound (I-5) as compound of formula (I) and one component (B), in particular the mixtures (I-5) + (2.1), (I-5) + (2.2), (I-5) + (2.6), (I-5) + (2.8), (I-5) + (2.11), (I-5) + (2.12), (I-5) + (2.13), (I-5) + (2.14), (I-5) + (2.15), (I-

5) + (2.16), (I-5) + (2.17), (I-5) + (2.29), (I-5) + (3.1), (I-5) + (3.2), (I-5) + (3.3), (I-5) + (3.4), (I-5) + (3.9), (I-5) + (3.10), (I-5) + (3.12), (I-5) + (3.16), (I-5) + (3.17), (I-5) + (3.22), (I-5) + (4.6), (I-5) + (5.1), (I-5) + (5.4), (I-5) + (5.5), (I-5) + (5.7), (I-5) + (5.8), (I-5) + (5.9), (I-5) + (5.16), (I-5) + (5.23), (I-5) + (5.25), (I-5) + (5.26), (I-5) + (5.29), (I-5) + (5.30), (I-5) + (7.7), (I-5) + (9.2), (I-5) + (9.4), (I-5) + (9.5), (I-5) + (10.9), (I-5) + (10.10), (I-5) + (12.9), (I-5) + (12.10), (I-5) + (14.4), (I-5) + (15.9), (I-5) + (15.24), (I-5) + (15.25), (I-5) + (15.26), (I-5) + (15.41), (I-5) + (15.42), (I-5) + (15.54), (I-5) + (15.55), (I-5) + (15.56), (I-5) + (15.60), (I-5) + (15.90).

In a preferred embodiment this invention is directed to mixtures comprising the compound (I-6) as compound of formula (I) and one component (B), in particular the mixtures (I-6) + (1.1), (I-6) + (1.2), (I-6) + (1.3), (I-6) + (1.4), (I-6) + (1.5), (I-6) + (1.6), (I-6) + (1.7), (I-6) + (1.8), (I-6) + (1.9), (I-6) + (1.10), (I-6) + (1.11), (I-6) + (1.12), (I-6) + (1.13), (I-6) + (1.14), (I-6) + (1.15), (I-6) + (1.16), (I-6) + (1.17), (I-6) + (1.18), (I-6) + (1.19), (I-6) + (1.20), (I-6) + (1.21), (I-6) + (1.22), (I-6) + (1.23), (I-6) + (1.24), (I-6) + (1.25), (I-6) + (1.26), (I-6) + (1.27), (I-6) + (1.28), (I-6) + (1.29), (I-6) + (1.30), (I-6) + (1.31), (I-6) + (1.32), (I-6) + (1.33), (I-6) + (1.34), (I-6) + (1.35), (I-6) + (1.36), (I-6) + (1.37), (I-6) + (1.38), (I-6) + (1.39), (I-6) + (1.40), (I-6) + (1.41), (I-6) + (1.42), (I-6) + (1.43), (I-6) + (1.44), (I-6) + (1.45), (I-6) + (1.46), (I-6) + (1.47), (I-6) + (1.48), (I-6) + (1.49), (I-6) + (1.50), (I-6) + (1.51), (I-6) + (1.52), (I-6) + (1.53), (I-6) + (1.54), (I-6) + (1.55), (I-6) + (1.56), (I-6) + (1.57), (I-6) + (1.58), (I-6) + (1.59), (I-6) + (1.60), (I-6) + (1.61), (I-6) + (1.62), (I-6) + (1.63), (I-6) + (1.64), (I-6) + (2.1), (I-6) + (2.2), (I-6) + (2.3), (I-6) + (2.4), (I-6) + (2.5), (I-6) + (2.6), (I-6) + (2.7), (I-6) + (2.8), (I-6) + (2.9), (I-6) + (2.10), (I-6) + (2.11), (I-6) + (2.12), (I-6) + (2.13), (I-6) + (2.14), (I-6) + (2.15), (I-6) + (2.16), (I-6) + (2.17), (I-6) + (2.18), (I-6) + (2.19), (I-6) + (2.20), (I-6) + (2.21), (I-6) + (2.22), (I-6) + (2.23), (I-6) + (2.24), (I-6) + (2.25), (I-6) + (2.26), (I-6) + (2.27), (I-6) + (2.28), (I-6) + (2.29), (I-6) + (3.1), (I-6) + (3.2), (I-6) + (3.3), (I-6) + (3.4), (I-6) + (3.5), (I-6) + (3.6), (I-6) + (3.7), (I-6) + (3.8), (I-6) + (3.9), (I-6) + (3.10), (I-6) + (3.11), (I-6) + (3.12), (I-6) + (3.13), (I-6) + (3.14), (I-6) + (3.15), (I-6) + (3.16), (I-6) + (3.17), (I-6) + (3.18), (I-6) + (3.19), (I-6) + (3.20), (I-6) + (3.21), (I-6) + (3.22), (I-6) + (3.23), (I-6) + (3.24), (I-6) + (3.25), (I-6) + (3.26), (I-6) + (3.27), (I-6) + (3.28), (I-6) + (3.29), (I-6) + (3.30), (I-6) + (3.31), (I-6) + (3.32), (I-6) + (3.33), (I-6) + (4.1), (I-6) + (4.2), (I-6) + (4.3), (I-6) + (4.4), (I-6) + (4.5), (I-6) + (4.6), (I-6) + (4.7), (I-6) + (4.8), (I-6) + (4.9), (I-6) + (4.10), (I-6) + (4.11), (I-6) + (4.12), (I-6) + (4.13), (I-6) + (4.14), (I-6) + (5.1), (I-6) + (5.2), (I-6) + (5.3), (I-6) + (5.4), (I-6) + (5.5), (I-6) + (5.6), (I-6) + (5.7), (I-6) + (5.8), (I-6) + (5.9), (I-6) + (5.10), (I-6) + (5.11), (I-6) + (5.12), (I-6) + (5.13), (I-6) + (5.14), (I-6) + (5.15), (I-6) + (5.16), (I-6) + (5.17), (I-6) + (5.18), (I-6) + (5.19), (I-6) + (5.20), (I-6) + (5.21), (I-6) + (5.22), (I-6) + (5.23), (I-6) + (5.24), (I-6) + (5.25), (I-6) + (5.26), (I-6) + (5.27), (I-6) + (5.28), (I-6) + (5.29), (I-6) + (5.30), (I-6) + (5.31), (I-6) + (5.32), (I-6) + (5.33), (I-6) + (5.34), (I-6) + (6.1), (I-6) + (6.2), (I-6) + (6.3), (I-6) + (6.4), (I-6) + (7.1), (I-6) + (7.2), (I-6) + (7.3), (I-6) + (7.4), (I-6) + (7.5), (I-6) + (7.6), (I-6) + (7.7), (I-6) + (7.8), (I-6) + (8.1), (I-6) + (8.2), (I-6) + (8.3), (I-6) + (8.4), (I-6) + (9.1), (I-6) + (9.2), (I-6) + (9.3), (I-6) + (9.4), (I-6) + (9.5), (I-6) + (9.6), (I-6) + (9.7), (I-

6) + (9.8), (I-6) + (9.9), (I-6) + (10.1), (I-6) + (10.2), (I-6) + (10.3), (I-6) + (10.4), (I-6) + (10.5), (I-6) + (10.6), (I-6) + (10.7), (I-6) + (10.8), (I-6) + (10.9), (I-6) + (10.10), (I-6) + (10.11), (I-6) + (10.12), (I-6) + (10.13), (I-6) + (10.14), (I-6) + (10.15), (I-6) + (11.1), (I-6) + (11.2), (I-6) + (11.3), (I-6) + (11.4), (I-6) + (11.5), (I-6) + (11.6), (I-6) + (11.7), (I-6) + (12.1), (I-6) + (12.2), (I-6) + (12.3), (I-6) + (12.4), (I-6) + (12.5), (I-6) + (12.6), (I-6) + (12.7), (I-6) + (12.8), (I-6) + (12.9), (I-6) + (12.10), (I-6) + (12.11), (I-6) + (12.12), (I-6) + (12.13), (I-6) + (13.1), (I-6) + (13.2), (I-6) + (13.3), (I-6) + (13.4), (I-6) + (13.5), (I-6) + (13.6), (I-6) + (13.7), (I-6) + (14.1), (I-6) + (14.2), (I-6) + (14.3), (I-6) + (14.4), (I-6) + (14.5), (I-6) + (15.1), (I-6) + (15.2), (I-6) + (15.3), (I-6) + (15.4), (I-6) + (15.5), (I-6) + (15.6), (I-6) + (15.7), (I-6) + (15.8), (I-6) + (15.9), (I-6) + (15.10), (I-6) + (15.11), (I-6) + (15.12), (I-6) + (15.13), (I-6) + (15.14), (I-6) + (15.15), (I-6) + (15.16), (I-6) + (15.17), (I-6) + (15.18), (I-6) + (15.19), (I-6) + (15.20), (I-6) + (15.21), (I-6) + (15.22), (I-6) + (15.23), (I-6) + (15.24), (I-6) + (15.25), (I-6) + (15.26), (I-6) + (15.27), (I-6) + (15.28), (I-6) + (15.29), (I-6) + (15.30), (I-6) + (15.31), (I-6) + (15.32), (I-6) + (15.33), (I-6) + (15.34), (I-6) + (15.35), (I-6) + (15.36), (I-6) + (15.37), (I-6) + (15.38), (I-6) + (15.39), (I-6) + (15.41), (I-6) + (15.42), (I-6) + (15.43), (I-6) + (15.44), (I-6) + (15.45), (I-6) + (15.46), (I-6) + (15.47), (I-6) + (15.48), (I-6) + (15.49), (I-6) + (15.50), (I-6) + (15.51), (I-6) + (15.52), (I-6) + (15.53), (I-6) + (15.54), (I-6) + (15.55), (I-6) + (15.56), (I-6) + (15.57), (I-6) + (15.58), (I-6) + (15.59), (I-6) + (15.60), (I-6) + (15.61), (I-6) + (15.62), (I-6) + (15.63), (I-6) + (15.64), (I-6) + (15.65), (I-6) + (15.66), (I-6) + (15.67), (I-6) + (15.68), (I-6) + (15.69), (I-6) + (15.70), (I-6) + (15.71), (I-6) + (15.72), (I-6) + (15.73), (I-6) + (15.74), (I-6) + (15.75), (I-6) + (15.76), (I-6) + (15.77), (I-6) + (15.78), (I-6) + (15.79), (I-6) + (15.80), (I-6) + (15.81), (I-6) + (15.82), (I-6) + (15.83), (I-6) + (15.84), (I-6) + (15.85), (I-6) + (15.86), (I-6) + (15.87), (I-6) + (15.88), (I-6) + (15.89), (I-6) + (15.90), (I-6) + (15.91), (I-6) + (15.92), (I-6) + (15.93), (I-6) + (15.94).

In a further particularly preferred embodiment this invention is directed to mixtures comprising the compound (I-6) as compound of formula (I) and one component (B), in particular the mixtures (I-6) + (2.1), (I-6) + (2.2), (I-6) + (2.6), (I-6) + (2.8), (I-6) + (2.11), (I-6) + (2.12), (I-6) + (2.13), (I-6) + (2.14), (I-6) + (2.15), (I-6) + (2.16), (I-6) + (2.17), (I-6) + (2.29), (I-6) + (3.1), (I-6) + (3.2), (I-6) + (3.3), (I-6) + (3.4), (I-6) + (3.9), (I-6) + (3.10), (I-6) + (3.12), (I-6) + (3.16), (I-6) + (3.17), (I-6) + (3.22), (I-6) + (4.6), (I-6) + (5.1), (I-6) + (5.4), (I-6) + (5.5), (I-6) + (5.7), (I-6) + (5.8), (I-6) + (5.9), (I-6) + (5.16), (I-6) + (5.23), (I-6) + (5.25), (I-6) + (5.26), (I-6) + (5.29), (I-6) + (5.30), (I-6) + (7.7), (I-6) + (9.2), (I-6) + (9.4), (I-6) + (9.5), (I-6) + (10.9), (I-6) + (10.10), (I-6) + (12.9), (I-6) + (12.10), (I-6) + (14.4), (I-6) + (15.9), (I-6) + (15.24), (I-6) + (15.25), (I-6) + (15.26), (I-6) + (15.41), (I-6) + (15.42), (I-6) + (15.54), (I-6) + (15.55), (I-6) + (15.56), (I-6) + (15.60), (I-6) + (15.90).

In a preferred embodiment this invention is directed to mixtures comprising the compound (I-7) as compound of formula (I) and one component (B), in particular the mixtures (I-7) + (1.1), (I-7) + (1.2), (I-7) + (1.3), (I-7) + (1.4), (I-7) + (1.5), (I-7) + (1.6), (I-7) + (1.7), (I-7) + (1.8), (I-7) + (1.9), (I-7) + (1.10), (I-7) + (1.11), (I-7) + (1.12), (I-7) + (1.13), (I-7) + (1.14), (I-7) + (1.15), (I-7) + (1.16), (I-7) + (1.17), (I-7) + (1.18), (I-

7) + (1.19), (I-7) + (1.20), (I-7) + (1.21), (I-7) + (1.22), (I-7) + (1.23), (I-7) + (1.24), (I-7) + (1.25), (I-7) + (1.26), (I-7) + (1.27), (I-7) + (1.28), (I-7) + (1.29), (I-7) + (1.30), (I-7) + (1.31), (I-7) + (1.32), (I-7) + (1.33), (I-7) + (1.34), (I-7) + (1.35), (I-7) + (1.36), (I-7) + (1.37), (I-7) + (1.38), (I-7) + (1.39), (I-7) + (1.40), (I-7) + (1.41), (I-7) + (1.42), (I-7) + (1.43), (I-7) + (1.44), (I-7) + (1.45), (I-7) + (1.46), (I-7) + (1.47), (I-7) + (1.48), (I-7) + (1.49), (I-7) + (1.50), (I-7) + (1.51), (I-7) + (1.52), (I-7) + (1.53), (I-7) + (1.54), (I-7) + (1.55), (I-7) + (1.56), (I-7) + (1.57), (I-7) + (1.58), (I-7) + (1.59), (I-7) + (1.60), (I-7) + (1.61), (I-7) + (1.62), (I-7) + (1.63), (I-7) + (1.64), (I-7) + (2.1), (I-7) + (2.2), (I-7) + (2.3), (I-7) + (2.4), (I-7) + (2.5), (I-7) + (2.6), (I-7) + (2.7), (I-7) + (2.8), (I-7) + (2.9), (I-7) + (2.10), (I-7) + (2.11), (I-7) + (2.12), (I-7) + (2.13), (I-7) + (2.14), (I-7) + (2.15), (I-7) + (2.16), (I-7) + (2.17), (I-7) + (2.18), (I-7) + (2.19), (I-7) + (2.20), (I-7) + (2.21), (I-7) + (2.22), (I-7) + (2.23), (I-7) + (2.24), (I-7) + (2.25), (I-7) + (2.26), (I-7) + (2.27), (I-7) + (2.28), (I-7) + (2.29), (I-7) + (3.1), (I-7) + (3.2), (I-7) + (3.3), (I-7) + (3.4), (I-7) + (3.5), (I-7) + (3.6), (I-7) + (3.7), (I-7) + (3.8), (I-7) + (3.9), (I-7) + (3.10), (I-7) + (3.11), (I-7) + (3.12), (I-7) + (3.13), (I-7) + (3.14), (I-7) + (3.15), (I-7) + (3.16), (I-7) + (3.17), (I-7) + (3.18), (I-7) + (3.19), (I-7) + (3.20), (I-7) + (3.21), (I-7) + (3.22), (I-7) + (3.23), (I-7) + (3.24), (I-7) + (3.25), (I-7) + (3.26), (I-7) + (3.27), (I-7) + (3.28), (I-7) + (3.29), (I-7) + (3.30), (I-7) + (3.31), (I-7) + (3.32), (I-7) + (3.33), (I-7) + (4.1), (I-7) + (4.2), (I-7) + (4.3), (I-7) + (4.4), (I-7) + (4.5), (I-7) + (4.6), (I-7) + (4.7), (I-7) + (4.8), (I-7) + (4.9), (I-7) + (4.10), (I-7) + (4.11), (I-7) + (4.12), (I-7) + (4.13), (I-7) + (4.14), (I-7) + (5.1), (I-7) + (5.2), (I-7) + (5.3), (I-7) + (5.4), (I-7) + (5.5), (I-7) + (5.6), (I-7) + (5.7), (I-7) + (5.8), (I-7) + (5.9), (I-7) + (5.10), (I-7) + (5.11), (I-7) + (5.12), (I-7) + (5.13), (I-7) + (5.14), (I-7) + (5.15), (I-7) + (5.16), (I-7) + (5.17), (I-7) + (5.18), (I-7) + (5.19), (I-7) + (5.20), (I-7) + (5.21), (I-7) + (5.22), (I-7) + (5.23), (I-7) + (5.24), (I-7) + (5.25), (I-7) + (5.26), (I-7) + (5.27), (I-7) + (5.28), (I-7) + (5.29), (I-7) + (5.30), (I-7) + (5.31), (I-7) + (5.32), (I-7) + (5.33), (I-7) + (5.34), (I-7) + (6.1), (I-7) + (6.2), (I-7) + (6.3), (I-7) + (6.4), (I-7) + (7.1), (I-7) + (7.2), (I-7) + (7.3), (I-7) + (7.4), (I-7) + (7.5), (I-7) + (7.6), (I-7) + (7.7), (I-7) + (7.8), (I-7) + (8.1), (I-7) + (8.2), (I-7) + (8.3), (I-7) + (8.4), (I-7) + (9.1), (I-7) + (9.2), (I-7) + (9.3), (I-7) + (9.4), (I-7) + (9.5), (I-7) + (9.6), (I-7) + (9.7), (I-7) + (9.8), (I-7) + (9.9), (I-7) + (10.1), (I-7) + (10.2), (I-7) + (10.3), (I-7) + (10.4), (I-7) + (10.5), (I-7) + (10.6), (I-7) + (10.7), (I-7) + (10.8), (I-7) + (10.9), (I-7) + (10.10), (I-7) + (10.11), (I-7) + (10.12), (I-7) + (10.13), (I-7) + (10.14), (I-7) + (10.15), (I-7) + (11.1), (I-7) + (11.2), (I-7) + (11.3), (I-7) + (11.4), (I-7) + (11.5), (I-7) + (11.6), (I-7) + (11.7), (I-7) + (12.1), (I-7) + (12.2), (I-7) + (12.3), (I-7) + (12.4), (I-7) + (12.5), (I-7) + (12.6), (I-7) + (12.7), (I-7) + (12.8), (I-7) + (12.9), (I-7) + (12.10), (I-7) + (12.11), (I-7) + (12.12), (I-7) + (12.13), (I-7) + (13.1), (I-7) + (13.2), (I-7) + (13.3), (I-7) + (13.4), (I-7) + (13.5), (I-7) + (13.6), (I-7) + (13.7), (I-7) + (14.1), (I-7) + (14.2), (I-7) + (14.3), (I-7) + (14.4), (I-7) + (14.5), (I-7) + (15.1), (I-7) + (15.2), (I-7) + (15.3), (I-7) + (15.4), (I-7) + (15.5), (I-7) + (15.6), (I-7) + (15.7), (I-7) + (15.8), (I-7) + (15.9), (I-7) + (15.10), (I-7) + (15.11), (I-7) + (15.12), (I-7) + (15.13), (I-7) + (15.14), (I-7) + (15.15), (I-7) + (15.16), (I-7) + (15.17), (I-7) + (15.18), (I-7) + (15.19), (I-7) + (15.20), (I-7) + (15.21), (I-7) + (15.22), (I-7) + (15.23), (I-7) + (15.24), (I-7) + (15.25), (I-7) + (15.26), (I-7) + (15.27), (I-7) + (15.28), (I-7) + (15.29), (I-7) + (15.30), (I-7) + (15.31), (I-7) + (15.32), (I-7) + (15.33), (I-7) + (15.34), (I-7) + (15.35), (I-7) + (15.36), (I-

7) + (15.37), (I-7) + (15.38), (I-7) + (15.39), (I-7) + (15.41), (I-7) + (15.42), (I-7) + (15.43), (I-7) + (15.44), (I-7) + (15.45), (I-7) + (15.46), (I-7) + (15.47), (I-7) + (15.48), (I-7) + (15.49), (I-7) + (15.50), (I-7) + (15.51), (I-7) + (15.52), (I-7) + (15.53), (I-7) + (15.54), (I-7) + (15.55), (I-7) + (15.56), (I-7) + (15.57), (I-7) + (15.58), (I-7) + (15.59), (I-7) + (15.60), (I-7) + (15.61), (I-7) + (15.62), (I-7) + (15.63), (I-7) + (15.64), (I-7) + (15.65), (I-7) + (15.66), (I-7) + (15.67), (I-7) + (15.68), (I-7) + (15.69), (I-7) + (15.70), (I-7) + (15.71), (I-7) + (15.72), (I-7) + (15.73), (I-7) + (15.74), (I-7) + (15.75), (I-7) + (15.76), (I-7) + (15.77), (I-7) + (15.78), (I-7) + (15.79), (I-7) + (15.80), (I-7) + (15.81), (I-7) + (15.82), (I-7) + (15.83), (I-7) + (15.84), (I-7) + (15.85), (I-7) + (15.86), (I-7) + (15.87), (I-7) + (15.88), (I-7) + (15.89), (I-7) + (15.90), (I-7) + (15.91), (I-7) + (15.92), (I-7) + (15.93), (I-7) + (15.94).

In a further particularly preferred embodiment this invention is directed to mixtures comprising the compound (I-7) as compound of formula (I) and one component (B), in particular the mixtures (I-7) + (2.1), (I-7) + (2.2), (I-7) + (2.6), (I-7) + (2.8), (I-7) + (2.11), (I-7) + (2.12), (I-7) + (2.13), (I-7) + (2.14), (I-7) + (2.15), (I-7) + (2.16), (I-7) + (2.17), (I-7) + (2.29), (I-7) + (3.1), (I-7) + (3.2), (I-7) + (3.3), (I-7) + (3.4), (I-7) + (3.9), (I-7) + (3.10), (I-7) + (3.12), (I-7) + (3.16), (I-7) + (3.17), (I-7) + (3.22), (I-7) + (4.6), (I-7) + (5.1), (I-7) + (5.4), (I-7) + (5.5), (I-7) + (5.7), (I-7) + (5.8), (I-7) + (5.9), (I-7) + (5.16), (I-7) + (5.23), (I-7) + (5.25), (I-7) + (5.26), (I-7) + (5.29), (I-7) + (5.30), (I-7) + (7.7), (I-7) + (9.2), (I-7) + (9.4), (I-7) + (9.5), (I-7) + (10.9), (I-7) + (10.10), (I-7) + (12.9), (I-7) + (12.10), (I-7) + (14.4), (I-7) + (15.9), (I-7) + (15.24), (I-7) + (15.25), (I-7) + (15.26), (I-7) + (15.41), (I-7) + (15.42), (I-7) + (15.54), (I-7) + (15.55), (I-7) + (15.56), (I-7) + (15.60), (I-7) + (15.90).

In a preferred embodiment this invention is directed to mixtures comprising the compound (I-8) as compound of formula (I) and one component (B), in particular the mixtures (I-8) + (1.1), (I-8) + (1.2), (I-8) + (1.3), (I-8) + (1.4), (I-8) + (1.5), (I-8) + (1.6), (I-8) + (1.7), (I-8) + (1.8), (I-8) + (1.9), (I-8) + (1.10), (I-8) + (1.11), (I-8) + (1.12), (I-8) + (1.13), (I-8) + (1.14), (I-8) + (1.15), (I-8) + (1.16), (I-8) + (1.17), (I-8) + (1.18), (I-8) + (1.19), (I-8) + (1.20), (I-8) + (1.21), (I-8) + (1.22), (I-8) + (1.23), (I-8) + (1.24), (I-8) + (1.25), (I-8) + (1.26), (I-8) + (1.27), (I-8) + (1.28), (I-8) + (1.29), (I-8) + (1.30), (I-8) + (1.31), (I-8) + (1.32), (I-8) + (1.33), (I-8) + (1.34), (I-8) + (1.35), (I-8) + (1.36), (I-8) + (1.37), (I-8) + (1.38), (I-8) + (1.39), (I-8) + (1.40), (I-8) + (1.41), (I-8) + (1.42), (I-8) + (1.43), (I-8) + (1.44), (I-8) + (1.45), (I-8) + (1.46), (I-8) + (1.47), (I-8) + (1.48), (I-8) + (1.49), (I-8) + (1.50), (I-8) + (1.51), (I-8) + (1.52), (I-8) + (1.53), (I-8) + (1.54), (I-8) + (1.55), (I-8) + (1.56), (I-8) + (1.57), (I-8) + (1.58), (I-8) + (1.59), (I-8) + (1.60), (I-8) + (1.61), (I-8) + (1.62), (I-8) + (1.63), (I-8) + (1.64), (I-8) + (2.1), (I-8) + (2.2), (I-8) + (2.3), (I-8) + (2.4), (I-8) + (2.5), (I-8) + (2.6), (I-8) + (2.7), (I-8) + (2.8), (I-8) + (2.9), (I-8) + (2.10), (I-8) + (2.11), (I-8) + (2.12), (I-8) + (2.13), (I-8) + (2.14), (I-8) + (2.15), (I-8) + (2.16), (I-8) + (2.17), (I-8) + (2.18), (I-8) + (2.19), (I-8) + (2.20), (I-8) + (2.21), (I-8) + (2.22), (I-8) + (2.23), (I-8) + (2.24), (I-8) + (2.25), (I-8) + (2.26), (I-8) + (2.27), (I-8) + (2.28), (I-8) + (2.29), (I-8) + (3.1), (I-8) + (3.2), (I-8) + (3.3), (I-8) + (3.4), (I-8) + (3.5), (I-8) + (3.6), (I-8) + (3.7), (I-8) + (3.8), (I-8) + (3.9), (I-8) + (3.10), (I-8) + (3.11), (I-8) + (3.12), (I-8) + (3.13),

(I-8) + (3.14), (I-8) + (3.15), (I-8) + (3.16), (I-8) + (3.17), (I-8) + (3.18), (I-8) + (3.19), (I-8) + (3.20), (I-8) + (3.21), (I-8) + (3.22), (I-8) + (3.23), (I-8) + (3.24), (I-8) + (3.25), (I-8) + (3.26), (I-8) + (3.27), (I-8) + (3.28), (I-8) + (3.29), (I-8) + (3.30), (I-8) + (3.31), (I-8) + (3.32), (I-8) + (3.33), (I-8) + (4.1), (I-8) + (4.2), (I-8) + (4.3), (I-8) + (4.4), (I-8) + (4.5), (I-8) + (4.6), (I-8) + (4.7), (I-8) + (4.8), (I-8) + (4.9), (I-8) + (4.10), (I-8) + (4.11), (I-8) + (4.12), (I-8) + (4.13), (I-8) + (4.14), (I-8) + (5.1), (I-8) + (5.2), (I-8) + (5.3), (I-8) + (5.4), (I-8) + (5.5), (I-8) + (5.6), (I-8) + (5.7), (I-8) + (5.8), (I-8) + (5.9), (I-8) + (5.10), (I-8) + (5.11), (I-8) + (5.12), (I-8) + (5.13), (I-8) + (5.14), (I-8) + (5.15), (I-8) + (5.16), (I-8) + (5.17), (I-8) + (5.18), (I-8) + (5.19), (I-8) + (5.20), (I-8) + (5.21), (I-8) + (5.22), (I-8) + (5.23), (I-8) + (5.24), (I-8) + (5.25), (I-8) + (5.26), (I-8) + (5.27), (I-8) + (5.28), (I-8) + (5.29), (I-8) + (5.30), (I-8) + (5.31), (I-8) + (5.32), (I-8) + (5.33), (I-8) + (5.34), (I-8) + (6.1), (I-8) + (6.2), (I-8) + (6.3), (I-8) + (6.4), (I-8) + (7.1), (I-8) + (7.2), (I-8) + (7.3), (I-8) + (7.4), (I-8) + (7.5), (I-8) + (7.6), (I-8) + (7.7), (I-8) + (7.8), (I-8) + (8.1), (I-8) + (8.2), (I-8) + (8.3), (I-8) + (8.4), (I-8) + (9.1), (I-8) + (9.2), (I-8) + (9.3), (I-8) + (9.4), (I-8) + (9.5), (I-8) + (9.6), (I-8) + (9.7), (I-8) + (9.8), (I-8) + (9.9), (I-8) + (10.1), (I-8) + (10.2), (I-8) + (10.3), (I-8) + (10.4), (I-8) + (10.5), (I-8) + (10.6), (I-8) + (10.7), (I-8) + (10.8), (I-8) + (10.9), (I-8) + (10.10), (I-8) + (10.11), (I-8) + (10.12), (I-8) + (10.13), (I-8) + (10.14), (I-8) + (10.15), (I-8) + (11.1), (I-8) + (11.2), (I-8) + (11.3), (I-8) + (11.4), (I-8) + (11.5), (I-8) + (11.6), (I-8) + (11.7), (I-8) + (12.1), (I-8) + (12.2), (I-8) + (12.3), (I-8) + (12.4), (I-8) + (12.5), (I-8) + (12.6), (I-8) + (12.7), (I-8) + (12.8), (I-8) + (12.9), (I-8) + (12.10), (I-8) + (12.11), (I-8) + (12.12), (I-8) + (12.13), (I-8) + (13.1), (I-8) + (13.2), (I-8) + (13.3), (I-8) + (13.4), (I-8) + (13.5), (I-8) + (13.6), (I-8) + (13.7), (I-8) + (14.1), (I-8) + (14.2), (I-8) + (14.3), (I-8) + (14.4), (I-8) + (14.5), (I-8) + (15.1), (I-8) + (15.2), (I-8) + (15.3), (I-8) + (15.4), (I-8) + (15.5), (I-8) + (15.6), (I-8) + (15.7), (I-8) + (15.8), (I-8) + (15.9), (I-8) + (15.10), (I-8) + (15.11), (I-8) + (15.12), (I-8) + (15.13), (I-8) + (15.14), (I-8) + (15.15), (I-8) + (15.16), (I-8) + (15.17), (I-8) + (15.18), (I-8) + (15.19), (I-8) + (15.20), (I-8) + (15.21), (I-8) + (15.22), (I-8) + (15.23), (I-8) + (15.24), (I-8) + (15.25), (I-8) + (15.26), (I-8) + (15.27), (I-8) + (15.28), (I-8) + (15.29), (I-8) + (15.30), (I-8) + (15.31), (I-8) + (15.32), (I-8) + (15.33), (I-8) + (15.34), (I-8) + (15.35), (I-8) + (15.36), (I-8) + (15.37), (I-8) + (15.38), (I-8) + (15.39), (I-8) + (15.41), (I-8) + (15.42), (I-8) + (15.43), (I-8) + (15.44), (I-8) + (15.45), (I-8) + (15.46), (I-8) + (15.47), (I-8) + (15.48), (I-8) + (15.49), (I-8) + (15.50), (I-8) + (15.51), (I-8) + (15.52), (I-8) + (15.53), (I-8) + (15.54), (I-8) + (15.55), (I-8) + (15.56), (I-8) + (15.57), (I-8) + (15.58), (I-8) + (15.59), (I-8) + (15.60), (I-8) + (15.61), (I-8) + (15.62), (I-8) + (15.63), (I-8) + (15.64), (I-8) + (15.65), (I-8) + (15.66), (I-8) + (15.67), (I-8) + (15.68), (I-8) + (15.69), (I-8) + (15.70), (I-8) + (15.71), (I-8) + (15.72), (I-8) + (15.73), (I-8) + (15.74), (I-8) + (15.75), (I-8) + (15.76), (I-8) + (15.77), (I-8) + (15.78), (I-8) + (15.79), (I-8) + (15.80), (I-8) + (15.81), (I-8) + (15.82), (I-8) + (15.83), (I-8) + (15.84), (I-8) + (15.85), (I-8) + (15.86), (I-8) + (15.87), (I-8) + (15.88), (I-8) + (15.89), (I-8) + (15.90), (I-8) + (15.91), (I-8) + (15.92), (I-8) + (15.93), (I-8) + (15.94).

In a further particularly preferred embodiment this invention is directed to mixtures comprising the compound (I-8) as compound of formula (I) and one component (B), in particular the mixtures (I-8) + (2.1), (I-8) + (2.2),

(I-8) + (2.6), (I-8) + (2.8), (I-8) + (2.11), (I-8) + (2.12), (I-8) + (2.13), (I-8) + (2.14), (I-8) + (2.15), (I-8) + (2.16), (I-8) + (2.17), (I-8) + (2.29), (I-8) + (3.1), (I-8) + (3.2), (I-8) + (3.3), (I-8) + (3.4), (I-8) + (3.9), (I-8) + (3.10), (I-8) + (3.12), (I-8) + (3.16), (I-8) + (3.17), (I-8) + (3.22), (I-8) + (4.6), (I-8) + (5.1), (I-8) + (5.4), (I-8) + (5.5), (I-8) + (5.7), (I-8) + (5.8), (I-8) + (5.9), (I-8) + (5.16), (I-8) + (5.23), (I-8) + (5.25), (I-8) + (5.26), (I-8) + (5.29), (I-8) + (5.30), (I-8) + (7.7), (I-8) + (9.2), (I-8) + (9.4), (I-8) + (9.5), (I-8) + (10.9), (I-8) + (10.10), (I-8) + (12.9), (I-8) + (12.10), (I-8) + (14.4), (I-8) + (15.9), (I-8) + (15.24), (I-8) + (15.25), (I-8) + (15.26), (I-8) + (15.41), (I-8) + (15.42), (I-8) + (15.54), (I-8) + (15.55), (I-8) + (15.56), (I-8) + (15.60), (I-8) + (15.90).

In a preferred embodiment this invention is directed to mixtures comprising the compound (I-9) as compound of formula (I) and one component (B), in particular the mixtures (I-9) + (1.1), (I-9) + (1.2), (I-9) + (1.3), (I-9) + (1.4), (I-9) + (1.5), (I-9) + (1.6), (I-9) + (1.7), (I-9) + (1.8), (I-9) + (1.9), (I-9) + (1.10), (I-9) + (1.11), (I-9) + (1.12), (I-9) + (1.13), (I-9) + (1.14), (I-9) + (1.15), (I-9) + (1.16), (I-9) + (1.17), (I-9) + (1.18), (I-9) + (1.19), (I-9) + (1.20), (I-9) + (1.21), (I-9) + (1.22), (I-9) + (1.23), (I-9) + (1.24), (I-9) + (1.25), (I-9) + (1.26), (I-9) + (1.27), (I-9) + (1.28), (I-9) + (1.29), (I-9) + (1.30), (I-9) + (1.31), (I-9) + (1.32), (I-9) + (1.33), (I-9) + (1.34), (I-9) + (1.35), (I-9) + (1.36), (I-9) + (1.37), (I-9) + (1.38), (I-9) + (1.39), (I-9) + (1.40), (I-9) + (1.41), (I-9) + (1.42), (I-9) + (1.43), (I-9) + (1.44), (I-9) + (1.45), (I-9) + (1.46), (I-9) + (1.47), (I-9) + (1.48), (I-9) + (1.49), (I-9) + (1.50), (I-9) + (1.51), (I-9) + (1.52), (I-9) + (1.53), (I-9) + (1.54), (I-9) + (1.55), (I-9) + (1.56), (I-9) + (1.57), (I-9) + (1.58), (I-9) + (1.59), (I-9) + (1.60), (I-9) + (1.61), (I-9) + (1.62), (I-9) + (1.63), (I-9) + (1.64), (I-9) + (2.1), (I-9) + (2.2), (I-9) + (2.3), (I-9) + (2.4), (I-9) + (2.5), (I-9) + (2.6), (I-9) + (2.7), (I-9) + (2.8), (I-9) + (2.9), (I-9) + (2.10), (I-9) + (2.11), (I-9) + (2.12), (I-9) + (2.13), (I-9) + (2.14), (I-9) + (2.15), (I-9) + (2.16), (I-9) + (2.17), (I-9) + (2.18), (I-9) + (2.19), (I-9) + (2.20), (I-9) + (2.21), (I-9) + (2.22), (I-9) + (2.23), (I-9) + (2.24), (I-9) + (2.25), (I-9) + (2.26), (I-9) + (2.27), (I-9) + (2.28), (I-9) + (2.29), (I-9) + (3.1), (I-9) + (3.2), (I-9) + (3.3), (I-9) + (3.4), (I-9) + (3.5), (I-9) + (3.6), (I-9) + (3.7), (I-9) + (3.8), (I-9) + (3.9), (I-9) + (3.10), (I-9) + (3.11), (I-9) + (3.12), (I-9) + (3.13), (I-9) + (3.14), (I-9) + (3.15), (I-9) + (3.16), (I-9) + (3.17), (I-9) + (3.18), (I-9) + (3.19), (I-9) + (3.20), (I-9) + (3.21), (I-9) + (3.22), (I-9) + (3.23), (I-9) + (3.24), (I-9) + (3.25), (I-9) + (3.26), (I-9) + (3.27), (I-9) + (3.28), (I-9) + (3.29), (I-9) + (3.30), (I-9) + (3.31), (I-9) + (3.32), (I-9) + (3.33), (I-9) + (4.1), (I-9) + (4.2), (I-9) + (4.3), (I-9) + (4.4), (I-9) + (4.5), (I-9) + (4.6), (I-9) + (4.7), (I-9) + (4.8), (I-9) + (4.9), (I-9) + (4.10), (I-9) + (4.11), (I-9) + (4.12), (I-9) + (4.13), (I-9) + (4.14), (I-9) + (5.1), (I-9) + (5.2), (I-9) + (5.3), (I-9) + (5.4), (I-9) + (5.5), (I-9) + (5.6), (I-9) + (5.7), (I-9) + (5.8), (I-9) + (5.9), (I-9) + (5.10), (I-9) + (5.11), (I-9) + (5.12), (I-9) + (5.13), (I-9) + (5.14), (I-9) + (5.15), (I-9) + (5.16), (I-9) + (5.17), (I-9) + (5.18), (I-9) + (5.19), (I-9) + (5.20), (I-9) + (5.21), (I-9) + (5.22), (I-9) + (5.23), (I-9) + (5.24), (I-9) + (5.25), (I-9) + (5.26), (I-9) + (5.27), (I-9) + (5.28), (I-9) + (5.29), (I-9) + (5.30), (I-9) + (5.31), (I-9) + (5.32), (I-9) + (5.33), (I-9) + (5.34), (I-9) + (6.1), (I-9) + (6.2), (I-9) + (6.3), (I-9) + (6.4), (I-9) + (7.1), (I-9) + (7.2), (I-9) + (7.3), (I-9) + (7.4), (I-9) + (7.5), (I-9) + (7.6), (I-9) + (7.7), (I-9) + (7.8), (I-9) + (8.1), (I-9) + (8.2), (I-9) + (8.3), (I-

9) + (8.4), (I-9) + (9.1), (I-9) + (9.2), (I-9) + (9.3), (I-9) + (9.4), (I-9) + (9.5), (I-9) + (9.6), (I-9) + (9.7), (I-9) + (9.8), (I-9) + (9.9), (I-9) + (10.1), (I-9) + (10.2), (I-9) + (10.3), (I-9) + (10.4), (I-9) + (10.5), (I-9) + (10.6), (I-9) + (10.7), (I-9) + (10.8), (I-9) + (10.9), (I-9) + (10.10), (I-9) + (10.11), (I-9) + (10.12), (I-9) + (10.13), (I-9) + (10.14), (I-9) + (10.15), (I-9) + (11.1), (I-9) + (11.2), (I-9) + (11.3), (I-9) + (11.4), (I-9) + (11.5), (I-9) + (11.6), (I-9) + (11.7), (I-9) + (12.1), (I-9) + (12.2), (I-9) + (12.3), (I-9) + (12.4), (I-9) + (12.5), (I-9) + (12.6), (I-9) + (12.7), (I-9) + (12.8), (I-9) + (12.9), (I-9) + (12.10), (I-9) + (12.11), (I-9) + (12.12), (I-9) + (12.13), (I-9) + (13.1), (I-9) + (13.2), (I-9) + (13.3), (I-9) + (13.4), (I-9) + (13.5), (I-9) + (13.6), (I-9) + (13.7), (I-9) + (14.1), (I-9) + (14.2), (I-9) + (14.3), (I-9) + (14.4), (I-9) + (14.5), (I-9) + (15.1), (I-9) + (15.2), (I-9) + (15.3), (I-9) + (15.4), (I-9) + (15.5), (I-9) + (15.6), (I-9) + (15.7), (I-9) + (15.8), (I-9) + (15.9), (I-9) + (15.10), (I-9) + (15.11), (I-9) + (15.12), (I-9) + (15.13), (I-9) + (15.14), (I-9) + (15.15), (I-9) + (15.16), (I-9) + (15.17), (I-9) + (15.18), (I-9) + (15.19), (I-9) + (15.20), (I-9) + (15.21), (I-9) + (15.22), (I-9) + (15.23), (I-9) + (15.24), (I-9) + (15.25), (I-9) + (15.26), (I-9) + (15.27), (I-9) + (15.28), (I-9) + (15.29), (I-9) + (15.30), (I-9) + (15.31), (I-9) + (15.32), (I-9) + (15.33), (I-9) + (15.34), (I-9) + (15.35), (I-9) + (15.36), (I-9) + (15.37), (I-9) + (15.38), (I-9) + (15.39), (I-9) + (15.41), (I-9) + (15.42), (I-9) + (15.43), (I-9) + (15.44), (I-9) + (15.45), (I-9) + (15.46), (I-9) + (15.47), (I-9) + (15.48), (I-9) + (15.49), (I-9) + (15.50), (I-9) + (15.51), (I-9) + (15.52), (I-9) + (15.53), (I-9) + (15.54), (I-9) + (15.55), (I-9) + (15.56), (I-9) + (15.57), (I-9) + (15.58), (I-9) + (15.59), (I-9) + (15.60), (I-9) + (15.61), (I-9) + (15.62), (I-9) + (15.63), (I-9) + (15.64), (I-9) + (15.65), (I-9) + (15.66), (I-9) + (15.67), (I-9) + (15.68), (I-9) + (15.69), (I-9) + (15.70), (I-9) + (15.71), (I-9) + (15.72), (I-9) + (15.73), (I-9) + (15.74), (I-9) + (15.75), (I-9) + (15.76), (I-9) + (15.77), (I-9) + (15.78), (I-9) + (15.79), (I-9) + (15.80), (I-9) + (15.81), (I-9) + (15.82), (I-9) + (15.83), (I-9) + (15.84), (I-9) + (15.85), (I-9) + (15.86), (I-9) + (15.87), (I-9) + (15.88), (I-9) + (15.89), (I-9) + (15.90), (I-9) + (15.91), (I-9) + (15.92), (I-9) + (15.93), (I-9) + (15.94).

In a further particularly preferred embodiment this invention is directed to mixtures comprising the compound (I-9) as compound of formula (I) and one component (B), in particular the mixtures (I-9) + (2.1), (I-9) + (2.2), (I-9) + (2.6), (I-9) + (2.8), (I-9) + (2.11), (I-9) + (2.12), (I-9) + (2.13), (I-9) + (2.14), (I-9) + (2.15), (I-9) + (2.16), (I-9) + (2.17), (I-9) + (2.29), (I-9) + (3.1), (I-9) + (3.2), (I-9) + (3.3), (I-9) + (3.4), (I-9) + (3.9), (I-9) + (3.10), (I-9) + (3.12), (I-9) + (3.16), (I-9) + (3.17), (I-9) + (3.22), (I-9) + (4.6), (I-9) + (5.1), (I-9) + (5.4), (I-9) + (5.5), (I-9) + (5.7), (I-9) + (5.8), (I-9) + (5.9), (I-9) + (5.16), (I-9) + (5.23), (I-9) + (5.25), (I-9) + (5.26), (I-9) + (5.29), (I-9) + (5.30), (I-9) + (7.7), (I-9) + (9.2), (I-9) + (9.4), (I-9) + (9.5), (I-9) + (10.9), (I-9) + (10.10), (I-9) + (12.9), (I-9) + (12.10), (I-9) + (14.4), (I-9) + (15.9), (I-9) + (15.24), (I-9) + (15.25), (I-9) + (15.26), (I-9) + (15.41), (I-9) + (15.42), (I-9) + (15.54), (I-9) + (15.55), (I-9) + (15.56), (I-9) + (15.60), (I-9) + (15.90).

In a preferred embodiment this invention is directed to mixtures comprising the compound (I-10) as compound of formula (I) and one component (B), in particular the mixtures (I-10) + (1.1), (I-10) + (1.2), (I-10) + (1.3), (I-10) + (1.4), (I-10) + (1.5), (I-10) + (1.6), (I-10) + (1.7), (I-10) + (1.8), (I-10) + (1.9), (I-10) + (1.10), (I-

10) + (1.11), (I-10) + (1.12), (I-10) + (1.13), (I-10) + (1.14), (I-10) + (1.15), (I-10) + (1.16), (I-10) + (1.17), (I-10) + (1.18), (I-10) + (1.19), (I-10) + (1.20), (I-10) + (1.21), (I-10) + (1.22), (I-10) + (1.23), (I-10) + (1.24), (I-10) + (1.25), (I-10) + (1.26), (I-10) + (1.27), (I-10) + (1.28), (I-10) + (1.29), (I-10) + (1.30), (I-10) + (1.31), (I-10) + (1.32), (I-10) + (1.33), (I-10) + (1.34), (I-10) + (1.35), (I-10) + (1.36), (I-10) + (1.37), (I-10) + (1.38), (I-10) + (1.39), (I-10) + (1.40), (I-10) + (1.41), (I-10) + (1.42), (I-10) + (1.43), (I-10) + (1.44), (I-10) + (1.45), (I-10) + (1.46), (I-10) + (1.47), (I-10) + (1.48), (I-10) + (1.49), (I-10) + (1.50), (I-10) + (1.51), (I-10) + (1.52), (I-10) + (1.53), (I-10) + (1.54), (I-10) + (1.55), (I-10) + (1.56), (I-10) + (1.57), (I-10) + (1.58), (I-10) + (1.59), (I-10) + (1.60), (I-10) + (1.61), (I-10) + (1.62), (I-10) + (1.63), (I-10) + (1.64), (I-10) + (2.1), (I-10) + (2.2), (I-10) + (2.3), (I-10) + (2.4), (I-10) + (2.5), (I-10) + (2.6), (I-10) + (2.7), (I-10) + (2.8), (I-10) + (2.9), (I-10) + (2.10), (I-10) + (2.11), (I-10) + (2.12), (I-10) + (2.13), (I-10) + (2.14), (I-10) + (2.15), (I-10) + (2.16), (I-10) + (2.17), (I-10) + (2.18), (I-10) + (2.19), (I-10) + (2.20), (I-10) + (2.21), (I-10) + (2.22), (I-10) + (2.23), (I-10) + (2.24), (I-10) + (2.25), (I-10) + (2.26), (I-10) + (2.27), (I-10) + (2.28), (I-10) + (2.29), (I-10) + (3.1), (I-10) + (3.2), (I-10) + (3.3), (I-10) + (3.4), (I-10) + (3.5), (I-10) + (3.6), (I-10) + (3.7), (I-10) + (3.8), (I-10) + (3.9), (I-10) + (3.10), (I-10) + (3.11), (I-10) + (3.12), (I-10) + (3.13), (I-10) + (3.14), (I-10) + (3.15), (I-10) + (3.16), (I-10) + (3.17), (I-10) + (3.18), (I-10) + (3.19), (I-10) + (3.20), (I-10) + (3.21), (I-10) + (3.22), (I-10) + (3.23), (I-10) + (3.24), (I-10) + (3.25), (I-10) + (3.26), (I-10) + (3.27), (I-10) + (3.28), (I-10) + (3.29), (I-10) + (3.30), (I-10) + (3.31), (I-10) + (3.32), (I-10) + (3.33), (I-10) + (4.1), (I-10) + (4.2), (I-10) + (4.3), (I-10) + (4.4), (I-10) + (4.5), (I-10) + (4.6), (I-10) + (4.7), (I-10) + (4.8), (I-10) + (4.9), (I-10) + (4.10), (I-10) + (4.11), (I-10) + (4.12), (I-10) + (4.13), (I-10) + (4.14), (I-10) + (5.1), (I-10) + (5.2), (I-10) + (5.3), (I-10) + (5.4), (I-10) + (5.5), (I-10) + (5.6), (I-10) + (5.7), (I-10) + (5.8), (I-10) + (5.9), (I-10) + (5.10), (I-10) + (5.11), (I-10) + (5.12), (I-10) + (5.13), (I-10) + (5.14), (I-10) + (5.15), (I-10) + (5.16), (I-10) + (5.17), (I-10) + (5.18), (I-10) + (5.19), (I-10) + (5.20), (I-10) + (5.21), (I-10) + (5.22), (I-10) + (5.23), (I-10) + (5.24), (I-10) + (5.25), (I-10) + (5.26), (I-10) + (5.27), (I-10) + (5.28), (I-10) + (5.29), (I-10) + (5.30), (I-10) + (5.31), (I-10) + (5.32), (I-10) + (5.33), (I-10) + (5.34), (I-10) + (6.1), (I-10) + (6.2), (I-10) + (6.3), (I-10) + (6.4), (I-10) + (7.1), (I-10) + (7.2), (I-10) + (7.3), (I-10) + (7.4), (I-10) + (7.5), (I-10) + (7.6), (I-10) + (7.7), (I-10) + (7.8), (I-10) + (8.1), (I-10) + (8.2), (I-10) + (8.3), (I-10) + (8.4), (I-10) + (9.1), (I-10) + (9.2), (I-10) + (9.3), (I-10) + (9.4), (I-10) + (9.5), (I-10) + (9.6), (I-10) + (9.7), (I-10) + (9.8), (I-10) + (9.9), (I-10) + (10.1), (I-10) + (10.2), (I-10) + (10.3), (I-10) + (10.4), (I-10) + (10.5), (I-10) + (10.6), (I-10) + (10.7), (I-10) + (10.8), (I-10) + (10.9), (I-10) + (10.10), (I-10) + (10.11), (I-10) + (10.12), (I-10) + (10.13), (I-10) + (10.14), (I-10) + (10.15), (I-10) + (11.1), (I-10) + (11.2), (I-10) + (11.3), (I-10) + (11.4), (I-10) + (11.5), (I-10) + (11.6), (I-10) + (11.7), (I-10) + (12.1), (I-10) + (12.2), (I-10) + (12.3), (I-10) + (12.4), (I-10) + (12.5), (I-10) + (12.6), (I-10) + (12.7), (I-10) + (12.8), (I-10) + (12.9), (I-10) + (12.10), (I-10) + (12.11), (I-10) + (12.12), (I-10) + (12.13), (I-10) + (13.1), (I-10) + (13.2), (I-10) + (13.3), (I-10) + (13.4), (I-10) + (13.5), (I-10) + (13.6), (I-10) + (13.7), (I-10) + (14.1), (I-10) + (14.2), (I-10) + (14.3), (I-10) + (14.4), (I-10) + (14.5), (I-10) + (15.1), (I-10) + (15.2), (I-10) + (15.3), (I-10) + (15.4), (I-10) + (15.5), (I-10) + (15.6), (I-10) + (15.7), (I-10) + (15.8), (I-10) + (15.9), (I-10) + (15.10), (I-10) + (15.11), (I-10) + (15.12), (I-10) + (15.13), (I-

10) + (15.14), (I-10) + (15.15), (I-10) + (15.16), (I-10) + (15.17), (I-10) + (15.18), (I-10) + (15.19), (I-10) + (15.20), (I-10) + (15.21), (I-10) + (15.22), (I-10) + (15.23), (I-10) + (15.24), (I-10) + (15.25), (I-10) + (15.26), (I-10) + (15.27), (I-10) + (15.28), (I-10) + (15.29), (I-10) + (15.30), (I-10) + (15.31), (I-10) + (15.32), (I-10) + (15.33), (I-10) + (15.34), (I-10) + (15.35), (I-10) + (15.36), (I-10) + (15.37), (I-10) + (15.38), (I-10) + (15.39), (I-10) + (15.41), (I-10) + (15.42), (I-10) + (15.43), (I-10) + (15.44), (I-10) + (15.45), (I-10) + (15.46), (I-10) + (15.47), (I-10) + (15.48), (I-10) + (15.49), (I-10) + (15.50), (I-10) + (15.51), (I-10) + (15.52), (I-10) + (15.53), (I-10) + (15.54), (I-10) + (15.55), (I-10) + (15.56), (I-10) + (15.57), (I-10) + (15.58), (I-10) + (15.59), (I-10) + (15.60), (I-10) + (15.61), (I-10) + (15.62), (I-10) + (15.63), (I-10) + (15.64), (I-10) + (15.65), (I-10) + (15.66), (I-10) + (15.67), (I-10) + (15.68), (I-10) + (15.69), (I-10) + (15.70), (I-10) + (15.71), (I-10) + (15.72), (I-10) + (15.73), (I-10) + (15.74), (I-10) + (15.75), (I-10) + (15.76), (I-10) + (15.77), (I-10) + (15.78), (I-10) + (15.79), (I-10) + (15.80), (I-10) + (15.81), (I-10) + (15.82), (I-10) + (15.83), (I-10) + (15.84), (I-10) + (15.85), (I-10) + (15.86), (I-10) + (15.87), (I-10) + (15.88), (I-10) + (15.89), (I-10) + (15.90), (I-10) + (15.91), (I-10) + (15.92), (I-10) + (15.93), (I-10) + (15.94).

In a further particularly preferred embodiment this invention is directed to mixtures comprising the compound (I-10) as compound of formula (I) and one component (B), in particular the mixtures (I-10) + (2.1), (I-10) + (2.2), (I-10) + (2.6), (I-10) + (2.8), (I-10) + (2.11), (I-10) + (2.12), (I-10) + (2.13), (I-10) + (2.14), (I-10) + (2.15), (I-10) + (2.16), (I-10) + (2.17), (I-10) + (2.29), (I-10) + (3.1), (I-10) + (3.2), (I-10) + (3.3), (I-10) + (3.4), (I-10) + (3.9), (I-10) + (3.10), (I-10) + (3.12), (I-10) + (3.16), (I-10) + (3.17), (I-10) + (3.22), (I-10) + (4.6), (I-10) + (5.1), (I-10) + (5.4), (I-10) + (5.5), (I-10) + (5.7), (I-10) + (5.8), (I-10) + (5.9), (I-10) + (5.16), (I-10) + (5.23), (I-10) + (5.25), (I-10) + (5.26), (I-10) + (5.29), (I-10) + (5.30), (I-10) + (7.7), (I-10) + (9.2), (I-10) + (9.4), (I-10) + (9.5), (I-10) + (10.9), (I-10) + (10.10), (I-10) + (12.9), (I-10) + (12.10), (I-10) + (14.4), (I-10) + (15.9), (I-10) + (15.24), (I-10) + (15.25), (I-10) + (15.26), (I-10) + (15.41), (I-10) + (15.42), (I-10) + (15.54), (I-10) + (15.55), (I-10) + (15.56), (I-10) + (15.60), (I-10) + (15.90).

If the active compounds in the active compound combinations according to the invention are present in certain weight ratios, the synergistic effect is particularly pronounced. However, the weight ratios of the active compounds in the active compound combinations can be varied within a relatively wide range.

In the combinations according to the invention the compounds (A) and (B) are present in a synergistically effective weight ratio of A:B in a range of 1000:1 to 1:1000, preferably in a weight ratio of 100:1 to 1:1000, most preferably in a weight ratio of 50:1 to 1:500. Further ratios of A:B which can be used according to the present invention with increasing preference in the order given are: 750:1 to 1:750, 500:1 to 1:500, 300:1 to 1:300, 250:1 to 1:250, 220:1 to 1:220, 200:1 to 1:200, 170:1 to 1:170, 140:1 to 1:140, 120:1 to 1:120, 100:1 to 1:100, 95:1 to 1:95, 90:1 to 1:90, 85:1 to 1:85, 80:1 to 1:80, 75:1 to 1:75, 70:1 to 1:70, 65:1 to 1:65, 60:1 to 1:60, 55:1

to 1:55, 45:1 to 1:45, 40:1 to 1:40, 35:1 to 1:35, 30:1 to 1:30, 25:1 to 1:25, 15:1 to 1:15, 10:1 to 1:10, 5:1 to 1:5, 4:1 to 1:4, 3:1 to 1:3, 2:1 to 1:2 as well as 10:1 to 1:1000 and 1:1 to 1:1000.

Where a compound (A) or a compound (B) can be present as mixtures of various possible isomeric forms, in particular of stereoisomers, such as, for example, E and Z, threo and erythro, and also optical isomers, and, if appropriate, also of tautomers. What is claimed are both the E and the Z isomers and the threo and erythro and also the optical isomers (R and S), any mixtures of these isomers, and also the possible tautomeric forms.

Compounds (A) or compounds (B) having at least one basic centre are capable of forming, for example, acid addition salts, e.g. with strong inorganic acids, such as mineral acids, e.g. perchloric acid, sulfuric acid, nitric acid, nitrous acid, a phosphoric acid or a hydrohalic acid, with strong organic carboxylic acids, such as unsubstituted substituted, e.g. halo-substituted, C_1-C_4 alkanecarboxylic acids, e.g. acetic acid, saturated or unsaturated dicarboxylic acids, e.g. oxalic, malonic, succinic, maleic, fumaric and phthalic acid, hydroxycarboxylic acids, e.g. ascorbic, lactic, malic, tartaric and citric acid, or benzoic acid, or with organic sulfonic acids, such as unsubstituted or substituted, e.g. halo-substituted, C_1-C_4alkane- or aryl-sulfonic acids, e.g. methane- or p-toluene-sulfonic acid. Compounds (A) or compounds (B) having at least one acid group are capable of forming, for example, salts with bases, e.g. metal salts, such as alkali metal or alkaline earth metal salts, e.g. sodium, potassium or magnesium salts, or salts with ammonia or an organic amine, such as morpholine, piperidine, pyrrolidine, a mono-, di- or tri-lower alkylamine, e.g. ethyl-, diethyl-, triethyl- or dimethyl-propyl-amine, or a mono-, di- or tri-hydroxy-lower alkylamine, e.g. mono-, di- or tri-ethanolamine. In addition, corresponding internal salts may optionally be formed. In the context of the invention, preference is given to agrochemically advantageous salts. In view of the close relationship between the compounds (A) or the compounds (B) in free form and in the form of their salts, hereinabove and herein below any reference to the free compounds (A) or free compounds (B) or to their salts should be understood as including also the corresponding salts or the free compounds (A) or free compounds (B), respectively, where appropriate and expedient. The equivalent also applies to tautomers of compounds (A) or compounds (B) and to their salts.

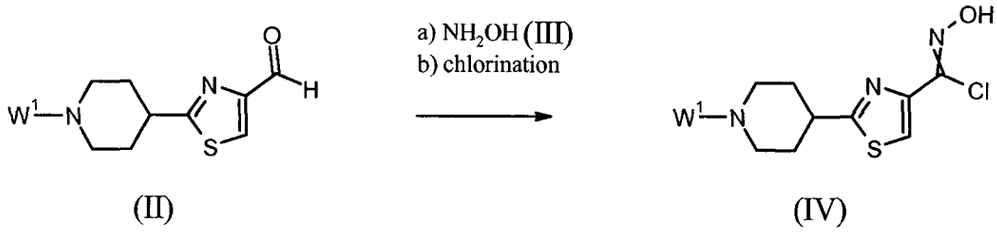
According to the invention the expression "combination" stands for the various combinations of compounds (A) and (B), for example in a single "ready-mix" form, in a combined spray mixture composed from separate formulations of the single active compounds, such as a "tank-mix", and in a combined use of the single active ingredients when applied in a sequential manner, i.e. one after the other with a reasonably short period, such as a few hours or days. Preferably the order of applying the compounds (A) and (B) is not essential for working the present invention.

Illustration of the processes and intermediates

The bis(difluoromethyl)pyrazole derivatives of the formula (I) can be prepared in different ways. First of all, the possible processes are shown schematically hereinafter. Unless stated otherwise, the radicals stated are each as defined above.

Process A

Scheme 1: Process A



(II) (IV)

W^1 is acetyl, C_1-C_4-alkoxycarbonyl, benzyl, benzyloxycarbonyl or [3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]acetyl

One means of preparing the intermediate **(IV)** from compound **(II)** is shown in Scheme 1 (Process A).

A compound of the general formula **(IV)** is obtained by condensation of an aldehyde of the formula **(II)** with hydroxylamine **(III)** and subsequent chlorination (see, for example, WO 05/0040159, WO 08/013622 and *Synthesis* **1987**, 11, 998-1001).

In process A, aldehyde **(II)** and hydroxylamine **(VII)** are first reacted (Scheme 1, step (a)). The corresponding oxime is subsequently chlorinated in the presence of a suitable chlorinating agent. Preferred chlorinating reagents are N-chlorosuccinimide, HClO and chlorine. After step (a) of process A, the reaction mixture can be worked up by customary methods or converted further directly in step (b).

The aldehyds **(II)** are commercially available (for W^1 = t-butoxycarbonyl: Maybridge) or can be prepared from commercially available precursors by methods described in the literature. For example, the aldehyds **(II)** can be prepared starting from the corresponding methyl- or ethylester by reduction with lithium aluminium hydrid in tetrahydrofurane at 0°C followed by an oxidation of the produced alkohols with Dess-Martin periodinane reagent at room temperature in dichloromethane (see e.g. WO 07/147336 und WO 07/039177 for the reduction with lithium aluminium hydrid and *J. Am. Chem. Soc.* **1978**, 100, 300-301; **1979**, 101, 5294-5299; **1991**, 113, 7277-7287 for the oxidation with Dess-Martin periodinane reagent).

Process A is preferably performed using one or more diluents. In step (a) of process A according to the invention, preference is given to using protic solvents, for example ethanol, as the solvent. After the formation of the corresponding oxime from compound **(II)**, the reaction mixture is diluted in step (b) with a

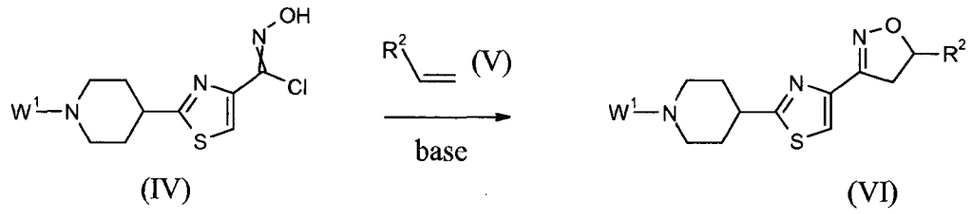
further solvent, for example tetrahydrofuran, and then admixed with aqueous sodium hypochlorite. The chlorination can likewise be effected with the aid of N-chlorosuccinimide in DMF.

In the performance of process A, the reaction temperatures can be varied within a relatively wide range. In general, the temperatures employed are from -10°C to +150°C, preferably temperatures from 0°C to +100°C, most preferably reflux temperature of the solvent in step (a), and 0°C to 30°C in step (b).

To perform process A, generally 1 to 2 mol, preferably 1 mol, of hydroxylamine (**III**) and generally 1 to 5 mol, preferably 1 mol, of a chlorinating reagent are used per mole of compound of the formula (**II**). The reaction time is 1 to 48 hours. The workup is effected by customary methods. If necessary, the compounds are purified by recrystallization, distillation or chromatography, or can optionally also be used in the next step without prior purification.

Process B

Scheme 2: Process B



(IV) (VI)

W^1 is acetyl, C_1-C_4-alkoxycarbonyl, benzyl, benzyloxycarbonyl or [3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]acetyl

R2 represents phenyl, which is at least substituted with one prop-2-yn-1-yloxy or one hydroxy group and optionally be additionally substituted by one, two or three substituents selected from the group consisting of methyl, methoxy, fluoro or chloro

One means of preparing the intermediate (**VI**) from compound (**IV**) is shown in Scheme 2 (Process B).

A compound of the general formula (**VI**) is obtained from an alkene of the general formula (**IV**) and compound (**V**) by a cycloaddition reaction (see, for example, WO08/013622, and *Synthesis*, **1987**, 11, 998-1001).

The alkenes (**V**) are commercially available or can be prepared from commercially available precursors by methods described in the literature (for example from ketones or aldehydes by a Wittig or Horner-Wadsworth-Emmons olefination: *Chem. Rev.* **1989**, 89, 863-927 and Julia olefination: *Tetrahedron Lett.*, **1973**, 14, 4833-4836; Peterson olefination: *J. Org. Chem.* **1968**, *33*, 780).

Process B is performed in the presence of a suitable base. Preferred bases are tertiary amines (e.g. triethylamine), and alkali metal or alkaline earth metal carbonates, hydrogencarbonates and phosphates.

Process B is preferably performed using one or more diluents. In the performance of process B, inert organic solvents are a preferred option (for example toluene and hexane). Water is likewise a possible solvent. Alternatively, process B can be performed in an excess of the alkene (**V**).

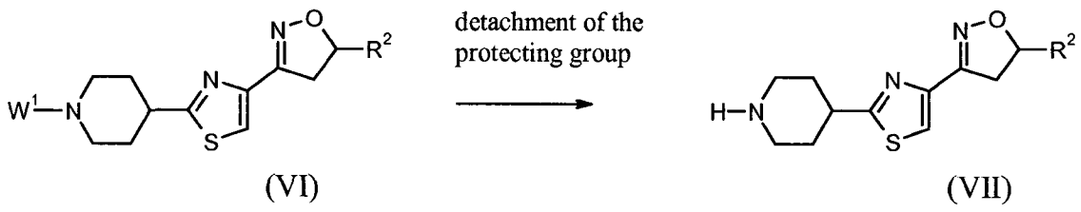
Typically, a suitable base and the olefin (**V**) are initially charged and compound (**IV**) is added. Alternatively, compounds (**IV**) and (**V**) are initially charged and a suitable base is added.

In the performance of process B, the reaction temperatures can be varied within a relatively wide range. In general, the temperatures employed are from -120°C to +150°C, preferably temperatures of -10°C to +100°C, most preferably 0°C to 30°C.

To perform process B, generally 0.5 to 5 mol, preferably 1 mol, of the alkene (**V**) are used per mole of compound of the formula (**IV**). The reaction time is 1 to 48 hours. The workup is effected by customary methods. If necessary, the compounds are purified by recrystallization, distillation or chromatography, or can optionally also be used in the next step without prior purification.

Process C

Scheme 3: Process C



(VI) (VII)

W^1 is acetyl, C_1-C_4-alkoxycarbonyl, benzyl or benzyloxycarbonyl

R2 represents phenyl, which is at least substituted with one prop-2-yn-1-yloxy or one hydroxy group and optionally be additionally substituted by one, two or three substituents selected from the group consisting of methyl, methoxy, fluoro or chloro

One means of preparing compounds of the formula (**VII**) from corresponding compounds (**VI**) is shown in Scheme 3.

A compound of the formula (**VI**) is converted to a compound of the formula (**VII**) by suitable methods for removing protecting groups, which are described in the literature ("*Protective Groups in Organic Synthesis*"; Third Edition; 1999; 494-653, and literature cited therein).

tert-Butoxycarbonyl and benzyloxycarbonyl protecting groups can be removed in an acidic medium (for example with hydrochloric acid or trifluoroacetic acid). Acetyl protecting groups can be removed under basic conditions (for example with potassium carbonate or caesium carbonate). Benzylic protecting groups can be removed by hydrogenolysis with hydrogen in the presence of a catalyst (for example palladium on activated carbon).

Useful solvents are all customary solvents which are inert under the reaction conditions, for example alcohols (e.g. methanol, ethanol, propanol), cyclic and acyclic ethers (e.g. diethyl ether, tetrahydrofuran, dioxane), aromatic hydrocarbons (e.g. benzene, toluene, xylene), halogenated hydrocarbons (e.g. dichloromethane, chloroform, carbon tetrachloride), halogenated aromatic hydrocarbons (e.g. chlorobenzene, dichlorobenzene), nitriles (e.g. acetonitrile), carboxylic esters (e.g. ethyl acetate), amides (e.g. N,N-dimethylformamide, N,N-dimethylacetamide), dimethyl sulphoxide, 1,3-dimethyl-2-imidazolinone, water and acetic acid, or the reaction can be performed in mixtures of two or more of these solvents.

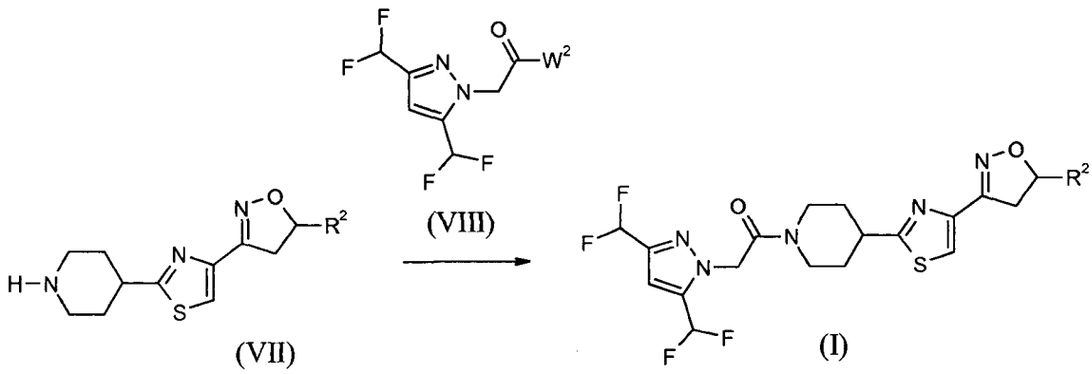
Acids which can be used for this reaction of deprotection of t-butoxycarbonyl and benzyloxycarbonyl groups are, for example, trifluoroacetic acid, hydrochloric acid or other acids as described in the literature (for example "*Protective Groups in Organic Synthesis*"; Third Edition; 1999; pp. 494-653).

The reaction is normally performed at temperatures of 0°C to +150°C and preferably at room temperature, but it can also be performed at reflux temperature of the reaction mixture. The reaction time varies as a function of the scale of the reaction and the reaction temperature, but is generally between half an hour and 72 hours.

After the reaction has ended, the compounds (**VII**) are separated from the reaction mixture by one of the customary separation techniques. If necessary, the compounds are purified by recrystallization, distillation or chromatography, or can, if desired, also be used in the next step without prior purification. It is also possible to isolate the compound of the general formula (**VII**) as a salt, for example as a salt of hydrochloric acid or of trifluoroacetic acid.

Process D

Scheme 4: Process D



W^2 is chlorine or OH

R2 represents phenyl, which is at least substituted with one prop-2-yn-1-yloxy or one hydroxy group and optionally be additionally substituted by one, two or three substituents selected from the group consisting of methyl, methoxy, fluoro or chloro

One means of preparing compounds of the formula (**I**) from corresponding compounds (**VII**) is shown in Scheme 4.

A compound with the general formula (**I**) can be synthesized analogously to methods described in the literature (see, for example WO 07/147336), by a coupling reaction of a compound with the corresponding general formula (**VII**) with a substrate of the general formula (**VIIIa**) where W^{2a} = chlorine, optionally in the presence of an acid scavenger/base.

Compounds (**VIIIa**) (W^{2a} = chlorine) or (**VIIIb**) (W^{2b} = OH) are either commercially available or can be prepared by processes described in the literature (see, for example, WO 08/013622 and WO 08/013925). In addition, a substrate with the general formula (**VIIIa**) where W^{2a} = chlorine can be prepared from the corresponding acid (W^{2b} = OH) by chlorination using processes known from the literature (e.g. *Tetrahedron* **2005**, 61, 10827-10852, and literature cited therein).

The solvents used may be all customary solvents which are inert under the reaction conditions, for example cyclic and acyclic ethers (e.g. diethyl ether, tetrahydrofuran, dioxane), aromatic hydrocarbons (e.g. benzene, toluene, xylene), halogenated hydrocarbons (e.g. dichloromethane, chloroform, carbon tetrachloride), halogenated aromatic hydrocarbons (e.g. chlorobenzene, dichlorobenzene) and nitriles (e.g. acetonitrile), or the reaction can be performed in mixtures of two or more of these solvents. The preferred solvents are tetrahydrofuran and dichloromethane.

At least one equivalent of an acid scavenger/a base (for example Hünig's base, triethylamine or commercially available polymeric acid scavengers) is used, in relation to the starting material of the general formula (**VII**). If the starting material is a salt, at least two equivalents of the acid scavenger are required.

The reaction is normally performed at temperatures of 0°C to 100°C and preferably at 20°C to 30°C, but it can also be performed at reflux temperature of the reaction mixture. The reaction time varies as a function of the scale of the reaction and the reaction temperature, but is generally between a few minutes and 48 hours.

After the reaction has ended, the compounds (**I**) are separated from the reaction mixture by one of the customary separation techniques. If necessary, the compounds are purified by recrystallization, distillation or chromatography, or can optionally also be used in the next step without prior purification.

Alternatively, a compound of the formula (**I**) can also be synthesized from the corresponding compound of the formula (**VII**) with a substrate of the formula (**VIIIb**) where W^{2b} = OH in the presence of a coupling reagent, analogously to methods described in the literature (e.g. *Tetrahedron* **2005**, 61, 10827-10852, and references cited therein).

Suitable coupling reagents are, for example, peptide coupling reagents (for example N-(3-dimethylaminopropyl)-N'-ethylcarbodiimide mixed with 4-dimethylaminopyridine, N-(3-dimethylaminopropyl)-N'-ethylcarbodiimide mixed with 1-hydroxybenzotriazole, bromotripyrrolidinophosphonium hexafluorophosphate, O-(7-azabenzotriazol-1-yl)-N,N,N',N'-tetramethyluronium hexafluorophosphate, etc.).

If appropriate, a base, for example triethylamine or Hünig's base, can be used in the reaction.

The hydroxy substituents in R^2 can be modified by reaction methods which are common knowledge to those skilled in the art at all stages of the synthesis in which they occur. For example, OH functionalities can be alkylated by known methods with suitable halides or sulphates (see, for example, J. March: Advanced Organic Chemistry – Reactions, Mechanisms, and Structures, 4th Ed. (1992), Wiley, New York, pages 388-390, 406-407, 411-415). Examples of such reactions can be found in the synthesis part of this application.

The solvents used may be all customary solvents which are inert under the reaction conditions, for example alcohols (e.g. methanol, ethanol, propanol), cyclic and acyclic ethers (e.g. diethyl ether, tetrahydrofuran, dioxane), aromatic hydrocarbons (e.g. benzene, toluene, xylene), halogenated hydrocarbons (e.g. dichloromethane, chloroform, carbon tetrachloride), halogenated aromatic hydrocarbons (e.g. chlorobenzene, dichlorobenzene), nitriles (e.g. acetonitrile) and amides (e.g. N,N-dimethylformamide, N,N-dimethylacetamide), or the reaction can be performed in mixtures of two or more of these solvents. The preferred solvent is dichloromethane.

The reaction is normally performed at temperatures of 0°C – 100°C and preferably at 0°C – 30°C, but it can also be carried out at reflux temperature of the reaction mixture. The reaction time varies as a function of the scale of the reaction and the reaction temperature, but is generally between a few minutes and 48 hours.

After the reaction has ended, the compounds (**I**) are separated from the reaction mixture by one of the customary separation techniques. If necessary, the compounds are purified by recrystallization, distillation or chromatography, or can optionally also be used in the next step without prior purification.

The present invention furthermore relates to compositions for combating/controlling undesirable microorganisms comprising the active compound combinations according to the invention. Preferably, the compositions are fungicidal compositions comprising agriculturally suitable auxiliaries, solvents, carriers, surfactants or extenders.

Furthermore the invention relates to a method of combating undesirable microorganisms, characterized in that the active compound combinations according to the invention are applied to the phytopathogenic fungi and/or their habitat.

According to the invention, carrier is to be understood as meaning a natural or synthetic, organic or inorganic substance which is mixed or combined with the active compounds for better applicability, in particular for application to plants or plant parts or seeds. The carrier, which may be solid or liquid, is generally inert and should be suitable for use in agriculture.

Suitable solid or liquid carriers are: for example ammonium salts and natural ground minerals, such as kaolins, clays, talc, chalk, quartz, attapulgite, montmorillonite or diatomaceous earth, and ground synthetic minerals, such as finely divided silica, alumina and natural or synthetic silicates, resins, waxes, solid fertilizers, water, alcohols, especially butanol, organic solvents, mineral oils and vegetable oils, and also derivatives thereof. It is also possible to use mixtures of such carriers. Solid carriers suitable for granules are: for example crushed and fractionated natural minerals, such as calcite, marble, pumice, sepiolite, dolomite, and also synthetic granules of inorganic and organic meals and also granules of organic material, such as sawdust, coconut shells, maize cobs and tobacco stalks.

Suitable liquefied gaseous extenders or carriers are liquids which are gaseous at ambient temperature and under atmospheric pressure, for example aerosol propellants, such as butane, propane, nitrogen and carbon dioxide.

Tackifiers, such as carboxymethylcellulose and natural and synthetic polymers in the form of powders, granules and latices, such as gum arabic, polyvinyl alcohol, polyvinyl acetate, or else natural phospholipids, such as cephalins and lecithins and synthetic phospholipids can be used in the formulations. Other possible additives are mineral and vegetable oils and waxes, optionally modified.

If the extender used is water, it is also possible for example, to use organic solvents as auxiliary solvents. Suitable liquid solvents are essentially: aromatic compounds, such as xylene, toluene or alkylnaphthalenes, chlorinated aromatic compounds or chlorinated aliphatic hydrocarbons, such as chlorobenzenes, chloroethylenes or methylene chloride, aliphatic hydrocarbons, such as cyclohexane or paraffins, for example mineral oil fractions, mineral and vegetable oils, alcohols, such as butanol or glycol, and also ethers and esters thereof, ketones, such as acetone, methyl ethyl ketone, methyl isobutyl ketone or cyclohexanone, strongly polar solvents, such as dimethylformamide and dimethyl sulphoxide, and also water.

The compositions according to the invention may comprise additional further components, such as, for example, surfactants. Suitable surfactants are emulsifiers, dispersants or wetting agents having ionic or nonionic properties, or mixtures of these surfactants. Examples of these are salts of polyacrylic acid, salts

of lignosulphonic acid, salts of phenolsulphonic acid or naphthalenesulphonic acid, polycondensates of ethylene oxide with fatty alcohols or with fatty acids or with fatty amines, substituted phenols (preferably alkylphenols or arylphenols), salts of sulphosuccinic esters, taurine derivatives (preferably alkyl taurates), phosphoric esters of polyethoxylated alcohols or phenols, fatty esters of polyols, and derivatives of the compounds containing sulphates, sulphonates and phosphates. The presence of a surfactant is required if one of the active compounds and/or one of the inert carriers is insoluble in water and when the application takes place in water. The proportion of surfactants is between 5 and 40 per cent by weight of the composition according to the invention.

It is possible to use colorants such as inorganic pigments, for example iron oxide, titanium oxide, Prussian blue, and organic dyes, such as alizarin dyes, azo dyes and metal phthalocyanine dyes, and trace nutrients, such as salts of iron, manganese, boron, copper, cobalt, molybdenum and zinc.

If appropriate, other additional components may also be present, for example protective colloids, binders, adhesives, thickeners, thixotropic substances, penetrants, stabilizers, sequestering agents, complex formers. In general, the active compounds can be combined with any solid or liquid additive customarily used for formulation purposes.

In general, the compositions according to the invention comprise between 0.05 and 99 per cent by weight, 0.01 and 98 per cent by weight, preferable between 0.1 and 95 per cent by weight, particularly preferred between 0.5 and 90 per cent by weight of the active compound combination according to the invention, very particularly preferable between 10 and 70 per cent by weight.

The active compound combinations or compositions according to the invention can be used as such or, depending on their respective physical and/or chemical properties, in the form of their formulations or the use forms prepared therefrom, such as aerosols, capsule suspensions, cold-fogging concentrates, warm-fogging concentrates, encapsulated granules, fine granules, flowable concentrates for the treatment of seed, ready-to-use solutions, dustable powders, emulsifiable concentrates, oil-in-water emulsions, water-in-oil emulsions, macrogranules, microgranules, oil-dispersible powders, oil-miscible flowable concentrates, oil-miscible liquids, foams, pastes, pesticide-coated seed, suspension concentrates, suspoemulsion concentrates, soluble concentrates, suspensions, wettable powders, soluble powders, dusts and granules, water-soluble granules or tablets, water-soluble powders for the treatment of seed, wettable powders, natural products and synthetic substances impregnated with active compound, and also microencapsulations in polymeric substances and in coating materials for seed, and also ULV cold-fogging and warm-fogging formulations.

The formulations mentioned can be prepared in a manner known per se, for example by mixing the active compounds or the active compound combinations with at least one additive. Suitable additives are all customary formulation auxiliaries, such as, for example, organic solvents, extenders, solvents or diluents, solid carriers and

fillers, surfactants (such as adjuvants, emulsifiers, dispersants, protective colloids, wetting agents and tackifiers), dispersants and/or binders or fixatives, preservatives, dyes and pigments, defoamers, inorganic and organic thickeners, water repellents, if appropriate siccatives and UV stabilizers, gibberellins and also water and further processing auxiliaries. Depending on the formulation type to be prepared in each case, further processing steps such as, for example, wet grinding, dry grinding or granulation may be required.

The compositions according to the invention do not only comprise ready-to-use compositions which can be applied with suitable apparatus to the plant or the seed, but also commercial concentrates which have to be diluted with water prior to use.

The active compound combinations according to the invention can be present in (commercial) formulations and in the use forms prepared from these formulations as a mixture with other (known) active compounds, such as insecticides, attractants, sterilants, bactericides, acaricides, nematicides, fungicides, growth regulators, herbicides, fertilizers, safeners and Semiochemicals.

The treatment according to the invention of the plants and plant parts with the active compounds or compositions is carried out directly or by action on their surroundings, habitat or storage space using customary treatment methods, for example by dipping, spraying, atomizing, irrigating, evaporating, dusting, fogging, broadcasting, foaming, painting, spreading-on, watering (drenching), drip irrigating and, in the case of propagation material, in particular in the case of seeds, furthermore as a powder for dry seed treatment, a solution for seed treatment, a water-soluble powder for slurry treatment, by incrusting, by coating with one or more layers, etc. It is furthermore possible to apply the active compounds by the ultra-low volume method, or to inject the active compound preparation or the active compound itself into the soil.

The invention furthermore comprises a method for treating seed. The invention furthermore relates to seed treated according to one of the methods described in the preceding paragraph.

The active compounds or compositions according to the invention are especially suitable for treating seed. A large part of the damage to crop plants caused by harmful organisms is triggered by an infection of the seed during storage or after sowing as well as during and after germination of the plant. This phase is particularly critical since the roots and shoots of the growing plant are particularly sensitive, and even small damage may result in the death of the plant. Accordingly, there is great interest in protecting the seed and the germinating plant by using appropriate compositions.

The control of phytopathogenic fungi by treating the seed of plants has been known for a long time and is the subject of continuous improvements. However, the treatment of seed entails a series of problems which cannot always be solved in a satisfactory manner. Thus, it is desirable to develop methods for protecting the seed and the germinating plant which dispense with the additional application of crop protection agents after sowing or

after the emergence of the plants or which at least considerably reduce additional application. It is furthermore desirable to optimize the amount of active compound employed in such a way as to provide maximum protection for the seed and the germinating plant from attack by phytopathogenic fungi, but without damaging the plant itself by the active compound employed. In particular, methods for the treatment of seed should also take into consideration the intrinsic fungicidal properties of transgenic plants in order to achieve optimum protection of the seed and the germinating plant with a minimum of crop protection agents being employed.

Accordingly, the present invention also relates in particular to a method for protecting seed and germinating plants against attack by phytopathogenic fungi by treating the seed with a composition according to the invention. The invention also relates to the use of the compositions according to the invention for treating seed for protecting the seed and the germinating plant against phytopathogenic fungi. Furthermore, the invention relates to seed treated with a composition according to the invention for protection against phytopathogenic fungi.

The control of phytopathogenic fungi which damage plants post-emergence is carried out primarily by treating the soil and the above-ground parts of plants with crop protection compositions. Owing to the concerns regarding a possible impact of the crop protection composition on the environment and the health of humans and animals, there are efforts to reduce the amount of active compounds applied.

One of the advantages of the present invention is that, because of the particular systemic properties of the compositions according to the invention, treatment of the seed with these compositions not only protects the seed itself, but also the resulting plants after emergence, from phytopathogenic fungi. In this manner, the immediate treatment of the crop at the time of sowing or shortly thereafter can be dispensed with.

It is also considered to be advantageous that the mixtures according to the invention can be used in particular also for transgenic seed where the plant growing from this seed is capable of expressing a protein which acts against pests. By treating such seed with the active compound combinations or compositions according to the invention, even by the expression of the, for example, insecticidal protein, certain pests may be controlled. Surprisingly, a further synergistic effect may be observed here, which additionally increases the effectiveness of the protection against attack by pests.

The compositions according to the invention are suitable for protecting seed of any plant variety employed in agriculture, in the greenhouse, in forests or in horticulture or viticulture. In particular, this takes the form of seed of cereals (such as wheat, barley, rye, triticale, millet, oats), maize (corn), cotton, soya bean, rice, potatoes, sunflowers, beans, coffee, beets (e.g. sugar beets and fodder beets), peanuts, oilseed rape, poppies, olives, coconuts, cacao, sugar cane, tobacco, vegetables (such as tomatoes, cucumbers, onions and lettuce), lawn and ornamental plants (also see below). The treatment of seeds of cereals (such as wheat, barley, rye, triticale, and oats), maize (corn) and rice is of particular importance.

As also described further below, the treatment of transgenic seed with the active compound combinations or compositions according to the invention is of particular importance. This refers to the seed of plants containing at least one heterologous gene which allows the expression of a polypeptide or protein having insecticidal properties. The heterologous gene in transgenic seed can originate, for example, from microorganisms of the species Bacillus, Rhizobium, Pseudomonas, Serratia, Trichoderma, Clavibacter, Glomus or Gliocladium. Preferably, this heterologous gene is from Bacillus sp., the gene product having activity against the European corn borer and/or the Western corn rootworm. Particularly preferably, the heterologous gene originates from Bacillus thuringiensis.

In the context of the present invention, the active compound combinations or compositions according to the invention are applied on their own or in a suitable formulation to the seed. Preferably, the seed is treated in a state in which it is sufficiently stable so that the treatment does not cause any damage. In general, treatment of the seed may take place at any point in time between harvesting and sowing. Usually, the seed used is separated from the plant and freed from cobs, shells, stalks, coats, hairs or the flesh of the fruits. Thus, it is possible to use, for example, seed which has been harvested, cleaned and dried to a moisture content of less than 15 % by weight. Alternatively, it is also possible to use seed which, after drying, has been treated, for example, with water and then dried again.

When treating the seed, care must generally be taken that the amount of the composition according to the invention applied to the seed and/or the amount of further additives is chosen in such a way that the germination of the seed is not adversely affected, or that the resulting plant is not damaged. This must be borne in mind in particular in the case of active compounds which may have phytotoxic effects at certain application rates.

The compositions according to the invention can be applied directly, that is to say without comprising further components and without having been diluted. In general, it is preferable to apply the compositions to the seed in the form of a suitable formulation. Suitable formulations and methods for the treatment of seed are known to the person skilled in the art and are described, for example, in the following documents: US 4,272,417 A, US 4,245,432 A, US 4,808,430 A, US 5,876,739 A, US 2003/0176428 A1, WO 2002/080675 A1, WO 2002/028186 A2.

The active compound combinations which can be used according to the invention can be converted into customary seed dressing formulations, such as solutions, emulsions, suspensions, powders, foams, slurries or other coating materials for seed, and also ULV formulations.

These formulations are prepared in a known manner by mixing the active compounds or active compound combinations with customary additives, such as, for example, customary extenders and also solvents or diluents, colorants, wetting agents, dispersants, emulsifiers, defoamers, preservatives, secondary thickeners, adhesives, gibberellins and water as well.

Suitable colorants that may be present in the seed dressing formulations which can be used according to the invention include all colorants customary for such purposes. Use may be made both of pigments, of sparing solubility in water, and of dyes, which are soluble in water. Examples that may be mentioned include the colorants known under the designations Rhodamine B, C.I. Pigment Red 112, and C.I. Solvent Red 1.

Suitable wetting agents that may be present in the seed dressing formulations which can be used according to the invention include all substances which promote wetting and are customary in the formulation of active agrochemical substances. With preference it is possible to use alkylnaphthalene-sulphonates, such as diisopropyl- or diisobutylnaphthalene-sulphonates.

Suitable dispersants and/or emulsifiers that may be present in the seed dressing formulations which can be used according to the invention include all nonionic, anionic, and cationic dispersants which are customary in the formulation of active agrochemical substances. With preference, it is possible to use nonionic or anionic dispersants or mixtures of nonionic or anionic dispersants. Particularly suitable nonionic dispersants are ethylene oxide-propylene oxide block polymers, alkylphenol polyglycol ethers, and tristyrylphenol polyglycol ethers, and their phosphated or sulphated derivatives. Particularly suitable anionic dispersants are lignosulphonates, polyacrylic salts, and arylsulphonate-formaldehyde condensates.

Defoamers that may be present in the seed dressing formulations to be used according to the invention include all foam-inhibiting compounds which are customary in the formulation of agrochemically active compounds. Preference is given to using silicone defoamers, magnesium stearate, silicone emulsions, long-chain alcohols, fatty acids and their salts and also organofluorine compounds and mixtures thereof.

Preservatives that may be present in the seed dressing formulations to be used according to the invention include all compounds which can be used for such purposes in agrochemical compositions. By way of example, mention may be made of dichlorophen and benzyl alcohol hemiformal.

Secondary thickeners that may be present in the seed dressing formulations to be used according to the invention include all compounds which can be used for such purposes in agrochemical compositions. Preference is given to cellulose derivatives, acrylic acid derivatives, polysaccharides, such as xanthan gum or Veegum, modified clays, phyllosilicates, such as attapulgite and bentonite, and also finely divided silicic acids.

Suitable adhesives that may be present in the seed dressing formulations to be used according to the invention include all customary binders which can be used in seed dressings. Polyvinylpyrrolidone, polyvinyl acetate, polyvinyl alcohol and tylose may be mentioned as being preferred.

Suitable gibberellins that may be present in the seed dressing formulations to be used according to the invention are preferably the gibberellins A1, A3 (= gibberellic acid), A4 and A7; particular preference is given to using gibberellic acid. The gibberellins are known (cf. R. Wegler "Chemie der Pflanzenschutz- and Schäd-

lingsbekämpfungsmittel" [Chemistry of Crop Protection Agents and Pesticides], Vol. 2, Springer Verlag, 1970, pp. 401-412).

The seed dressing formulations which can be used according to the invention may be used directly or after dilution with water beforehand to treat seed of any of a very wide variety of types. The seed dressing formulations which can be used according to the invention or their dilute preparations may also be used to dress seed of transgenic plants. In this context, synergistic effects may also arise in interaction with the substances formed by expression.

Suitable mixing equipment for treating seed with the seed dressing formulations which can be used according to the invention or the preparations prepared from them by adding water includes all mixing equipment which can commonly be used for dressing. The specific procedure adopted when dressing comprises introducing the seed into a mixer, adding the particular desired amount of seed dressing formulation, either as it is or following dilution with water beforehand, and carrying out mixing until the formulation is uniformly distributed on the seed. Optionally, a drying operation follows.

The active compounds or compositions according to the invention have strong microbicidal activity and can be used for controlling unwanted microorganisms, such as fungi and bacteria, in crop protection and material protection.

In crop protection, fungicides can be used for controlling Plasmodiophoromycetes, Oomycetes, Chytridiomycetes, Zygomycetes, Ascomycetes, Basidiomycetes and Deuteromycetes.
In crop protection, bactericides can be used for controlling Pseudomonadaceae, Rhizobiaceae, Enterobacteriaceae, Corynebacteriaceae and Streptomycetaceae.

The fungicidal compositions according to the invention can be used for the curative or protective control of phytopathogenic fungi. Accordingly, the invention also relates to curative and protective methods for controlling phytopathogenic fungi using the active compound combinations or compositions according to the invention, which are applied to the seed, the plant or plant parts, the fruit or the soil in which the plants grow. Preference is given to application onto the plant or the plant parts, the fruits or the soil in which the plants grow.

The compositions according to the invention for combating phytopathogenic fungi in crop protection comprise an active, but non-phytotoxic amount of the compounds according to the invention. "Active, but non-phytotoxic amount" shall mean an amount of the composition according to the invention which is sufficient to control or to completely kill the plant disease caused by fungi, which amount at the same time does not exhibit noteworthy symptoms of phytotoxicity. These application rates generally may be varied in a broader range, which rate depends on several factors, e.g. the phytopathogenic fungi, the plant or crop, the climatic conditions and the ingredients of the composition according to the invention.

The fact that the active compounds, at the concentrations required for the controlling of plant diseases, are well tolerated by plants permits the treatment of aerial plant parts, of vegetative propagation material and seed, and of the soil.

According to the invention, it is possible to treat all plants and parts of plants. Plants are to be understood here as meaning all plants and plant populations, such as wanted and unwanted wild plants or crop plants (including naturally occurring crop plants). Crop plants can be plants which can be obtained by conventional breeding and optimization methods or by biotechnological and genetic engineering methods or combinations of these methods, including the transgenic plants and including plant cultivars which can or cannot be protected by plant variety protection rights. Parts of plants are to be understood as meaning all above-ground and below-ground parts and organs of the plants, such as shoot, leaf, flower and root, examples which may be mentioned being leaves, needles, stems, trunks, flowers, fruit bodies, fruits and seeds and also roots, tubers and rhizomes. Plant parts also include harvested material and vegetative and generative propagation material, for example seedlings, tubers, rhizomes, cuttings and seeds. Preference is given to the treatment of the plants and the above-ground and below-ground parts and organs of the plants, such as shoot, leaf, flower and root, examples which may be mentioned being leaves, needles, stems, trunks, flowers, and fruits.

The active compounds of the invention, in combination with good plant tolerance and favourable toxicity to warm-blooded animals and being tolerated well by the environment, are suitable for protecting plants and plant organs, for increasing the harvest yields, for improving the quality of the harvested material. They may be preferably employed as crop protection agents. They are active against normally sensitive and resistant species and against all or some stages of development.

The following plants may be mentioned as plants which can be treated according to the invention: cotton, flax, grapevines, fruit, vegetable, such as *Rosaceae sp.* (for example pomaceous fruit, such as apples and pears, but also stone fruit, such as apricots, cherries, almonds and peaches and soft fruit such as strawberries), *Ribesioidae sp.*, *Juglandaceae sp.*, *Betulaceae sp.*, *Anacardiaceae sp.*, *Fagaceae sp.*, *Moraceae sp.*, *Oleaceae sp.*, *Actinidaceae sp.*, *Lauraceae sp.*, *Musaceae sp.* (for example banana trees and plantations), *Rubiaceae sp.* (for example coffee), *Theaceae sp.*, *Sterculiceae sp.*, *Rutaceae sp.* (for example lemons, oranges and grapefruit), *Solanaceae sp.* (for example tomatoes), *Liliaceae sp.*, *Asteraceae sp.* (for example lettuce), *Umbelliferae sp.*, *Cruciferae sp.*, *Chenopodiaceae sp.*, *Cucurbitaceae sp.* (for example cucumbers), *Alliaceae sp.* (for example leek, onions), *Papilionaceae sp.* (for example peas); major crop plants, such *Gramineae sp.* (for example maize, lawn, cereals such as wheat, rye, rice, barley, oats, millet and triticale), *Asteraceae sp.* (for example sunflowers), *Brassicaceae sp.* (for example white cabbage, red cabbage, broccoli, cauliflowers, Brussels sprouts, pak choi, kohlrabi, garden radish, and also oilseed rape, mustard, horseradish and cress), *Fabacae sp.* (for example beans, peas, peanuts), *Papilionaceae sp.* (for example soya beans), *Solanaceae sp.* (for example potatoes), *Chenopodiaceae sp.* (for

example sugar beet, fodder beet, Swiss chard, beetroot); crop plants and ornamental plants in garden and forest; and also in each case genetically modified varieties of these plants.

As already mentioned above, it is possible to treat all plants and their parts according to the invention. In a preferred embodiment, wild plant species and plant cultivars, or those obtained by conventional biological breeding methods, such as crossing or protoplast fusion, and parts thereof, are treated. In a further preferred embodiment, transgenic plants and plant cultivars obtained by genetic engineering methods, if appropriate in combination with conventional methods (genetically modified organisms), and parts thereof are treated. The terms "parts", "parts of plants" and "plant parts" have been explained above. Particularly preferably, plants of the plant cultivars which are in each case commercially available or in use are treated according to the invention. Plant cultivars are to be understood as meaning plants having novel properties ("traits") which have been obtained by conventional breeding, by mutagenesis or by recombinant DNA techniques. These can be cultivars, bio- or genotypes.

The method of treatment according to the invention is used in the treatment of genetically modified organisms (GMOs), e.g. plants or seeds. Genetically modified plants (or transgenic plants) are plants of which a heterologous gene has been stably integrated into the genome. The expression "heterologous gene" essentially means a gene which is provided or assembled outside the plant and when introduced in the nuclear, chloroplastic or mitochondrial genome gives the transformed plant new or improved agronomic or other properties by expressing a protein or polypeptide of interest or by down regulating or silencing other gene(s) which are present in the plant (using for example, antisense technology, co-suppression technology or RNA interference – RNAi - technology). A heterologous gene that is located in the genome is also called a transgene. A transgene that is defined by its particular location in the plant genome is called a transformation or transgenic event.

Depending on the plant species or plant cultivars, their location and growth conditions (soils, climate, vegetation period, diet), the treatment according to the invention may also result in super-additive ("synergistic") effects. Thus, for example, reduced application rates and/or a widening of the activity spectrum and/or an increase in the activity of the active compounds and compositions which can be used according to the invention, better plant growth, increased tolerance to high or low temperatures, increased tolerance to drought or to water or soil salt content, increased flowering performance, easier harvesting, accelerated maturation, higher harvest yields, bigger fruits, larger plant height, greener leaf color, earlier flowering, higher quality and/or a higher nutritional value of the harvested products, higher sugar concentration within the fruits, better storage stability and/or processability of the harvested products are possible, which exceed the effects which were actually to be expected.

At certain application rates, the active compound combinations according to the invention may also have a strengthening effect in plants. Accordingly, they are also suitable for mobilizing the defense system of the plant against attack by unwanted phytopathogenic fungi and/ or microorganisms and/or viruses. This may, if appropriate, be one of the reasons of the enhanced activity of the combinations according to the invention, for example against fungi. Plant-strengthening (resistance-inducing) substances are to be understood as meaning, in the present context, those substances or combinations of substances which are capable of stimulating the defense system of plants in such a way that, when subsequently inoculated with unwanted phytopathogenic fungi and/or microorganisms and/or viruses, the treated plants display a substantial degree of resistance to these phytopathogenic fungi and/or microorganisms and/or viruses, Thus, the substances according to the invention can be employed for protecting plants against attack by the abovementioned pathogens within a certain period of time after the treatment. The period of time within which protection is effected generally extends from 1 to 10 days, preferably 1 to 7 days, after the treatment of the plants with the active compounds.

Plants and plant cultivars which are preferably to be treated according to the invention include all plants which have genetic material which impart particularly advantageous, useful traits to these plants (whether obtained by breeding and/or biotechnological means).

Plants and plant cultivars which are also preferably to be treated according to the invention are resistant against one or more biotic stresses, i.e. said plants show a better defense against animal and microbial pests, such as against nematodes, insects, mites, phytopathogenic fungi, bacteria, viruses and/or viroids.

Plants and plant cultivars which may also be treated according to the invention are those plants which are resistant to one or more abiotic stresses. Abiotic stress conditions may include, for example, drought, cold temperature exposure, heat exposure, osmotic stress, flooding, increased soil salinity, increased mineral exposure, ozon exposure, high light exposure, limited availability of nitrogen nutrients, limited availability of phosphorus nutrients, shade avoidance.

Plants and plant cultivars which may also be treated according to the invention, are those plants characterized by enhanced yield characteristics. Increased yield in said plants can be the result of, for example, improved plant physiology, growth and development, such as water use efficiency, water retention efficiency, improved nitrogen use, enhanced carbon assimilation, improved photosynthesis, increased germination efficiency and accelerated maturation. Yield can furthermore be affected by improved plant architecture (under stress and non-stress conditions), including but not limited to, early flowering, flowering control for hybrid seed production, seedling vigor, plant size, internode number and distance, root growth, seed size, fruit size, pod size, pod or ear number, seed number per pod or ear, seed mass, enhanced seed filling, reduced seed dispersal, reduced pod dehiscence and lodging resistance. Further yield traits include

seed composition, such as carbohydrate content, protein content, oil content and composition, nutritional value, reduction in anti-nutritional compounds, improved processability and better storage stability.

Plants that may be treated according to the invention are hybrid plants that already express the characteristic of heterosis or hybrid vigor which results in generally higher yield, vigor, health and resistance towards biotic and abiotic stress factors. Such plants are typically made by crossing an inbred male-sterile parent line (the female parent) with another inbred male-fertile parent line (the male parent). Hybrid seed is typically harvested from the male sterile plants and sold to growers. Male sterile plants can sometimes (e.g. in corn) be produced by detasseling, i.e. the mechanical removal of the male reproductive organs (or males flowers) but, more typically, male sterility is the result of genetic determinants in the plant genome. In that case, and especially when seed is the desired product to be harvested from the hybrid plants it is typically useful to ensure that male fertility in the hybrid plants is fully restored. This can be accomplished by ensuring that the male parents have appropriate fertility restorer genes which are capable of restoring the male fertility in hybrid plants that contain the genetic determinants responsible for male-sterility. Genetic determinants for male sterility may be located in the cytoplasm. Examples of cytoplasmic male sterility (CMS) were for instance described in Brassica species. However, genetic determinants for male sterility can also be located in the nuclear genome. Male sterile plants can also be obtained by plant biotechnology methods such as genetic engineering. A particularly useful means of obtaining male-sterile plants is described in WO 89/10396 in which, for example, a ribonuclease such as barnase is selectively expressed in the tapetum cells in the stamens. Fertility can then be restored by expression in the tapetum cells of a ribonuclease inhibitor such as barstar.

Plants or plant cultivars (obtained by plant biotechnology methods such as genetic engineering) which may be treated according to the invention are herbicide-tolerant plants, i.e. plants made tolerant to one or more given herbicides. Such plants can be obtained either by genetic transformation, or by selection of plants containing a mutation imparting such herbicide tolerance.

Herbicide-tolerant plants are for example glyphosate-tolerant plants, i.e. plants made tolerant to the herbicide glyphosate or salts thereof. Plants can be made tolerant to glyphosate through different means. For example, glyphosate-tolerant plants can be obtained by transforming the plant with a gene encoding the enzyme 5-enolpyruvylshikimate-3-phosphate synthase (EPSPS). Examples of such EPSPS genes are the AroA gene (mutant CT7) of the bacterium S*almonella typhimurium*, the CP4 gene of the bacterium *Agrobacterium sp*, the genes encoding a Petunia EPSPS, a Tomato EPSPS, or an Eleusine EPSPS. It can also be a mutated EPSPS. Glyphosate-tolerant plants can also be obtained by expressing a gene that encodes a glyphosate oxido-reductase enzyme. Glyphosate-tolerant plants can also be obtained by expressing a gene that encodes a glyphosate acetyl transferase enzyme. Glyphosate-tolerant plants can also be obtained by selecting plants containing naturally-occurring mutations of the above-mentioned genes.

Other herbicide resistant plants are for example plants that are made tolerant to herbicides inhibiting the enzyme glutamine synthase, such as bialaphos, phosphinothricin or glufosinate. Such plants can be obtained by expressing an enzyme detoxifying the herbicide or a mutant glutamine synthase enzyme that is resistant to inhibition. One such efficient detoxifying enzyme is an enzyme encoding a phosphinothricin acetyltransferase (such as the bar or pat protein from Streptomyces species). Plants expressing an exogenous phosphinothricin acetyltransferase are also described.

Further herbicide-tolerant plants are also plants that are made tolerant to the herbicides inhibiting the enzyme hydroxyphenylpyruvatedioxygenase (HPPD). Hydroxyphenylpyruvatedioxygenases are enzymes that catalyze the reaction in which para-hydroxyphenylpyruvate (HPP) is transformed into homogentisate. Plants tolerant to HPPD-inhibitors can be transformed with a gene encoding a naturally-occurring resistant HPPD enzyme, or a gene encoding a mutated HPPD enzyme. Tolerance to HPPD-inhibitors can also be obtained by transforming plants with genes encoding certain enzymes enabling the formation of homogentisate despite the inhibition of the native HPPD enzyme by the HPPD-inhibitor. Tolerance of plants to HPPD inhibitors can also be improved by transforming plants with a gene encoding an enzyme prephenate dehydrogenase in addition to a gene encoding an HPPD-tolerant enzyme.

Still further herbicide resistant plants are plants that are made tolerant to acetolactate synthase (ALS) inhibitors. Known ALS-inhibitors include, for example, sulfonylurea, imidazolinone, triazolopyrimidines, pyrimidinyoxy(thio)benzoates, and/or sulfonylaminocarbonyltriazolinone herbicides. Different mutations in the ALS enzyme (also known as acetohydroxyacid synthase, AHAS) are known to confer tolerance to different herbicides and groups of herbicides. The production of sulfonylurea-tolerant plants and imidazolinone-tolerant plants is described in WO 1996/033270. Other imidazolinone-tolerant plants are also described. Further sulfonylurea- and imidazolinone-tolerant plants are also described in for example WO 2007/024782.

Other plants tolerant to imidazolinone and/or sulfonylurea can be obtained by induced mutagenesis, selection in cell cultures in the presence of the herbicide or mutation breeding as described for example for soybeans, for rice, for sugar beet, for lettuce, or for sunflower.

Plants or plant cultivars (obtained by plant biotechnology methods such as genetic engineering) which may also be treated according to the invention are insect-resistant transgenic plants, i.e. plants made resistant to attack by certain target insects. Such plants can be obtained by genetic transformation, or by selection of plants containing a mutation imparting such insect resistance.

An "insect-resistant transgenic plant", as used herein, includes any plant containing at least one transgene comprising a coding sequence encoding:

1) an insecticidal crystal protein from *Bacillus thuringiensis* or an insecticidal portion thereof, such as the insecticidal crystal proteins listed online at:

http://www.lifesci.sussex.ac.uk/Home/Neil_Crickmore/Bt/, or insecticidal portions thereof, e.g., proteins of the Cry protein classes Cry1Ab, Cry1Ac, Cry1F, Cry2Ab, Cry3Aa, or Cry3Bb or insecticidal portions thereof; or

2) a crystal protein from *Bacillus thuringiensis* or a portion thereof which is insecticidal in the presence of a second other crystal protein from *Bacillus thuringiensis* or a portion thereof, such as the binary toxin made up of the Cry34 and Cry35 crystal proteins; or

3) a hybrid insecticidal protein comprising parts of different insecticidal crystal proteins from *Bacillus thuringiensis,* such as a hybrid of the proteins of 1) above or a hybrid of the proteins of 2) above, e.g., the Cry1A.105 protein produced by corn event MON98034 (WO 2007/027777); or

4) a protein of any one of 1) to 3) above wherein some, particularly 1 to 10, amino acids have been replaced by another amino acid to obtain a higher insecticidal activity to a target insect species, and/or to expand the range of target insect species affected, and/or because of changes introduced into the encoding DNA during cloning or transformation, such as the Cry3Bb1 protein in corn events MON863 or MON88017, or the Cry3A protein in corn event MIR604;

5) an insecticidal secreted protein from *Bacillus thuringiensis* or *Bacillus cereus*, or an insecticidal portion thereof, such as the vegetative insecticidal (VIP) proteins listed at: http://www.lifesci.sussex.ac.uk/home/Neil_Crickmore/Bt/vip.html, e.g. proteins from the VIP3Aa protein class; or

6) secreted protein from *Bacillus thuringiensis* or *Bacillus cereus* which is insecticidal in the presence of a second secreted protein from *Bacillus thuringiensis* or *B. cereus*, such as the binary toxin made up of the VIP1A and VIP2A proteins; or

7) hybrid insecticidal protein comprising parts from different secreted proteins from *Bacillus thuringiensis* or *Bacillus cereus,* such as a hybrid of the proteins in 1) above or a hybrid of the proteins in 2) above; or

8) protein of any one of 1) to 3) above wherein some, particularly 1 to 10, amino acids have been replaced by another amino acid to obtain a higher insecticidal activity to a target insect species, and/or to expand the range of target insect species affected, and/or because of changes introduced into the encoding DNA during cloning or transformation (while still encoding an insecticidal protein), such as the VIP3Aa protein in cotton event COT102.

Of course, an insect-resistant transgenic plant, as used herein, also includes any plant comprising a combination of genes encoding the proteins of any one of the above classes 1 to 8. In one embodiment, an insect-resistant plant contains more than one transgene encoding a protein of any one of the above classes 1 to 8, to expand the range of target insect species affected when using different proteins directed at different target insect species, or to delay insect resistance development to the plants by using different proteins

insecticidal to the same target insect species but having a different mode of action, such as binding to different receptor binding sites in the insect.

Plants or plant cultivars (obtained by plant biotechnology methods such as genetic engineering) which may also be treated according to the invention are tolerant to abiotic stresses. Such plants can be obtained by genetic transformation, or by selection of plants containing a mutation imparting such stress resistance. Particularly useful stress tolerance plants include:

a. plants which contain a transgene capable of reducing the expression and/or the activity of poly(ADP-ribose)polymerase (PARP) gene in the plant cells or plants

b. plants which contain a stress tolerance enhancing transgene capable of reducing the expression and/or the activity of the PARG encoding genes of the plants or plants cells.

c. plants which contain a stress tolerance enhancing transgene coding for a plant-functional enzyme of the nicotinamide adenine dinucleotide salvage synthesis pathway including nicotinamidase, nicotinate phosphoribosyltransferase, nicotinic acid mononucleotide adenyl transferase, nicotinamide adenine dinucleotide synthetase or nicotine amide phosphorybosyltransferase.

Plants or plant cultivars (obtained by plant biotechnology methods such as genetic engineering) which may also be treated according to the invention show altered quantity, quality and/or storage-stability of the harvested product and/or altered properties of specific ingredients of the harvested product such as :

1) transgenic plants which synthesize a modified starch, which in its physical-chemical characteristics, in particular the amylose content or the amylose/amylopectin ratio, the degree of branching, the average chain length, the side chain distribution, the viscosity behaviour, the gelling strength, the starch grain size and/or the starch grain morphology, is changed in comparison with the synthesised starch in wild type plant cells or plants, so that this is better suited for special applications.

2) transgenic plants which synthesize non starch carbohydrate polymers or which synthesize non starch carbohydrate polymers with altered properties in comparison to wild type plants without genetic modification. Examples are plants producing polyfructose, especially of the inulin and levan-type, plants producing alpha 1,4 glucans, plants producing alpha-1,6 branched alpha-1,4-glucans, plants producing alternan,

3) transgenic plants which produce hyaluronan.

Plants or plant cultivars (that can be obtained by plant biotechnology methods such as genetic engineering) which may also be treated according to the invention are plants, such as cotton plants, with altered fiber characteristics. Such plants can be obtained by genetic transformation or by selection of plants contain a mutation imparting such altered fiber characteristics and include:

a) Plants, such as cotton plants, containing an altered form of cellulose synthase genes,

b) Plants, such as cotton plants, containing an altered form of rsw2 or rsw3 homologous nucleic acids,

c) Plants, such as cotton plants, with increased expression of sucrose phosphate synthase,

d) Plants, such as cotton plants, with increased expression of sucrose synthase,

e) Plants, such as cotton plants, wherein the timing of the plasmodesmatal gating at the basis of the fiber cell is altered, e.g. through downregulation of fiberselective β 1,3-glucanase,

f) Plants, such as cotton plants, having fibers with altered reactivity, e.g. through the expression of N-acteylglucosaminetransferase gene including nodC and chitinsynthase genes.

Plants or plant cultivars (that can be obtained by plant biotechnology methods such as genetic engineering) which may also be treated according to the invention are plants, such as oilseed rape or related Brassica plants, with altered oil profile characteristics. Such plants can be obtained by genetic transformation or by selection of plants contain a mutation imparting such altered oil characteristics and include:

a) Plants, such as oilseed rape plants, producing oil having a high oleic acid content,

b) Plants such as oilseed rape plants, producing oil having a low linolenic acid content,

c) Plant such as oilseed rape plants, producing oil having a low level of saturated fatty acids.

Particularly useful transgenic plants which may be treated according to the invention are plants which comprise one or more genes which encode one or more toxins, such as the following which are sold under the trade names YIELD GARD® (for example maize, cotton, soya beans), KnockOut® (for example maize), BiteGard® (for example maize), Bt-Xtra® (for example maize), StarLink® (for example maize), Bollgard® (cotton), Nucotn® (cotton), Nucotn 33B®(cotton), NatureGard® (for example maize), Protecta® and NewLeaf® (potato). Examples of herbicide-tolerant plants which may be mentioned are maize varieties, cotton varieties and soya bean varieties which are sold under the trade names Roundup Ready® (tolerance to glyphosate, for example maize, cotton, soya bean), Liberty Link® (tolerance to phosphinotricin, for example oilseed rape), IMI® (tolerance to imidazolinones) and STS® (tolerance to sulphonylureas, for example maize). Herbicide-resistant plants (plants bred in a conventional manner for herbicide tolerance) which may be mentioned include the varieties sold under the name Clearfield® (for example maize).

Particularly useful transgenic plants which may be treated according to the invention are plants containing transformation events, or combination of transformation events, that are listed for example in the databases from various national or regional regulatory agencies (see for example http://gmoinfo.jrc.it/gmp_browse.aspx and http://www.agbios.com/dbase.php).

In material protection the substances of the invention may be used for the protection of technical materials against infestation and destruction by undesirable fungi and/or microorganisms.

Technical materials are understood to be in the present context non-living materials that have been prepared for use in engineering. For example, technical materials that are to be protected against micro-

biological change or destruction by the active materials of the invention can be adhesives, glues, paper and cardboard, textiles, carpets, leather, wood, paint and plastic articles, cooling lubricants and other materials that can be infested or destroyed by micro-organisms. Within the context of materials to be protected are also parts of production plants and buildings, for example cooling circuits, cooling and heating systems, air conditioning and ventilation systems, which can be adversely affected by the propagation of fungi and/or microorganisms. Within the context of the present invention, preferably mentioned as technical materials are adhesives, glues, paper and cardboard, leather, wood, paints, cooling lubricants and heat exchanger liquids, particularly preferred is wood. The combinations according to the invention can prevent disadvantageous effects like decaying, dis- and decoloring, or molding. The active compound combinations and compositions according to the invention can likewise be employed for protecting against colonization of objects, in particular ship hulls, sieves, nets, buildings, quays and signalling installations, which are in contact with sea water or brackish water.

The method of treatment according to the invention can also be used in the field of protecting storage goods against attack of fungi and microorganisms. According to the present invention, the term "storage goods" is understood to denote natural substances of vegetable or animal origin and their processed forms, which have been taken from the natural life cycle and for which long-term protection is desired. Storage goods of vegetable origin, such as plants or parts thereof, for example stalks, leafs, tubers, seeds, fruits or grains, can be protected in the freshly harvested state or in processed form, such as pre-dried, moistened, comminuted, ground, pressed or roasted. Also falling under the definition of storage goods is timber, whether in the form of crude timber, such as construction timber, electricity pylons and barriers, or in the form of finished articles, such as furniture or objects made from wood. Storage goods of animal origin are hides, leather, furs, hairs and the like. The combinations according the present invention can prevent disadvantageous effects such as decay, discoloration or mold. Preferably "storage goods" is understood to denote natural substances of vegetable origin and their processed forms, more preferably fruits and their processed forms, such as pomes, stone fruits, soft fruits and citrus fruits and their processed forms.

Some pathogens of fungal diseases which can be treated according to the invention may be mentioned by way of example, but not by way of limitation:

Diseases caused by powdery mildew pathogens, such as, for example, Blumeria species, such as, for example, Blumeria graminis; Podosphaera species, such as, for example, Podosphaera leucotricha; Sphaerotheca species, such as, for example, Sphaerotheca fuliginea; Uncinula species, such as, for example, Uncinula necator;

Diseases caused by rust disease pathogens, such as, for example, Gymnosporangium species, such as, for example, Gymnosporangium sabinae; Hemileia species, such as, for example, Hemileia vastatrix; Phakopsora species, such as, for example, Phakopsora pachyrhizi and Phakopsora meibomiae; Puccinia

species, such as, for example, Puccinia recondita or Puccinia triticina; Uromyces species, such as, for example, Uromyces appendiculatus;

Diseases caused by pathogens from the group of the Oomycetes, such as, for example, Bremia species, such as, for example, Bremia lactucae; Peronospora species, such as, for example, Peronospora pisi or P. brassicae; Phytophthora species, such as, for example Phytophthora infestans; Plasmopara species, such as, for example, Plasmopara viticola; Pseudoperonospora species, such as, for example, Pseudoperonospora humuli or Pseudoperonospora cubensis; Pythium species, such as, for example, Pythium ultimum;

Leaf blotch diseases and leaf wilt diseases caused, for example, by Alternaria species, such as, for example, Alternaria solani; Cercospora species, such as, for example, Cercospora beticola; Cladiosporium species, such as, for example, Cladiosporium cucumerinum; Cochliobolus species, such as, for example, Cochliobolus sativus (conidia form: Drechslera, Syn: Helminthosporium); Colletotrichum species, such as, for example, Colletotrichum lindemuthanium; Cycloconium species, such as, for example, Cycloconium oleaginum; Diaporthe species, such as, for example, Diaporthe citri; Elsinoe species, such as, for example, Elsinoe fawcettii; Gloeosporium species, such as, for example, Gloeosporium laeticolor; Glomerella species, such as, for example, Glomerella cingulata; Guignardia species, such as, for example, Guignardia bidwelli; Leptosphaeria species, such as, for example, Leptosphaeria maculans; Magnaporthe species, such as, for example, Magnaporthe grisea; Microdochium species, such as, for example, Microdochium nivale; Mycosphaerella species, such as, for example, Mycosphaerella graminicola and M. fijiensis; Phaeosphaeria species, such as, for example, Phaeosphaeria nodorum; Pyrenophora species, such as, for example, Pyrenophora teres; Ramularia species, such as, for example, Ramularia collo-cygni; Rhynchosporium species, such as, for example, Rhynchosporium secalis; Septoria species, such as, for example, Septoria apii; Typhula species, such as, for example, Typhula incarnata; Venturia species, such as, for example, Venturia inaequalis;

Root and stem diseases caused, for example, by Corticium species, such as, for example, Corticium graminearum; Fusarium species, such as, for example, Fusarium oxysporum; Gaeumannomyces species, such as, for example, Gaeumannomyces graminis; Rhizoctonia species, such as, for example Rhizoctonia solani; Tapesia species, such as, for example, Tapesia acuformis; Thielaviopsis species, such as, for example, Thielaviopsis basicola;

Ear and panicle diseases (including maize cobs) caused, for example, by Alternaria species, such as, for example, Alternaria spp.; Aspergillus species, such as, for example, Aspergillus flavus; Cladosporium species, such as, for example, Cladosporium cladosporioides; Claviceps species, such as, for example, Claviceps purpurea; Fusarium species, such as, for example, Fusarium culmorum; Gibberella species, such as, for example, Gibberella zeae; Monographella species, such as, for example, Monographella nivalis; Septoria species, such as for example, Septoria nodorum;

Diseases caused by smut fungi, such as, for example, Sphacelotheca species, such as, for example, Sphacelotheca reiliana; Tilletia species, such as, for example, Tilletia caries; T. controversa; Urocystis species, such as, for example, Urocystis occulta; Ustilago species, such as, for example, Ustilago nuda; U. nuda tritici;

Fruit rot caused, for example, by Aspergillus species, such as, for example, Aspergillus flavus; Botrytis species, such as, for example, Botrytis cinerea; Penicillium species, such as, for example, Penicillium expansum and P. purpurogenum; Sclerotinia species, such as, for example, Sclerotinia sclerotiorum; Verticilium species, such as, for example, Verticilium alboatrum;

Seed- and soil-borne rot and wilt diseases, and also diseases of seedlings, caused, for example, by Fusarium species, such as, for example, Fusarium culmorum; Phytophthora species, such as, for example, Phytophthora cactorum; Pythium species, such as, for example, Pythium ultimum; Rhizoctonia species, such as, for example, Rhizoctonia solani; Sclerotium species, such as, for example, Sclerotium rolfsii;

Cancerous diseases, galls and witches' broom caused, for example, by Nectria species, such as, for example, Nectria galligena;

Wilt diseases caused, for example, by Monilinia species, such as, for example, Monilinia laxa;

Deformations of leaves, flowers and fruits caused, for example, by Taphrina species, such as, for example, Taphrina deformans;

Degenerative diseases of woody plants caused, for example, by Esca species, such as, for example, Phaemoniella clamydospora and Phaeoacremonium aleophilum and Fomitiporia mediterranea;

Diseases of flowers and seeds caused, for example, by Botrytis species, such as, for example, Botrytis cinerea;

Diseases of plant tubers caused, for example, by Rhizoctonia species, such as, for example, Rhizoctonia solani; Helminthosporium species, such as, for example, Helminthosporium solani;

Diseases caused by bacteriopathogens, such as, for example, Xanthomonas species, such as, for example, Xanthomonas campestris pv. oryzae; Pseudomonas species, such as, for example, Pseudomonas syringae pv. lachrymans; Erwinia species, such as, for example, Erwinia amylovora.

Preference is given to controlling the following diseases of soya beans:

Fungal diseases on leaves, stems, pods and seeds caused, for example, by alternaria leaf spot (Alternaria spec. atrans tenuissima), anthracnose (Colletotrichum gloeosporoides dematium var. truncatum), brown spot (Septoria glycines), cercospora leaf spot and blight (Cercospora kikuchii), choanephora leaf blight (Choanephora infundibulifera trispora (Syn.)), dactuliophora leaf spot (Dactuliophora glycines), downy mildew (Peronospora manshurica), drechslera blight (Drechslera glycini), frogeye leaf spot (Cercospora sojina), leptosphaerulina leaf spot (Leptosphaerulina trifolii), phyllostica leaf spot (Phyllosticta sojaecola), pod and stem blight (Phomopsis sojae), powdery mildew (Microsphaera diffusa), pyrenochaeta leaf spot (Pyrenochaeta glycines), rhizoctonia aerial, foliage, and web blight (Rhizoctonia solani), rust (Phakopsora pachyrhizi Phakopsora meibomiae), scab (Sphaceloma glycines), stemphylium leaf blight (Stemphylium botryosum), target spot (Corynespora cassiicola).

Fungal diseases on roots and the stem base caused, for example, by black root rot (Calonectria crotalariae), charcoal rot (Macrophomina phaseolina), fusarium blight or wilt, root rot, and pod and collar rot (Fusarium oxysporum, Fusarium orthoceras, Fusarium semitectum, Fusarium equiseti), mycoleptodiscus

root rot (Mycoleptodiscus terrestris), neocosmospora (Neocosmopspora vasinfecta), pod and stem blight (Diaporthe phaseolorum), stem canker (Diaporthe phaseolorum var. caulivora), phytophthora rot (Phytophthora megasperma), brown stem rot (Phialophora gregata), pythium rot (Pythium aphanidermatum, Pythium irregulare, Pythium debaryanum, Pythium myriotylum, Pythium ultimum), rhizoctonia root rot, stem decay, and damping-off (Rhizoctonia solani), sclerotinia stem decay (Sclerotinia sclerotiorum), sclerotinia Southern blight (Sclerotinia rolfsii), thielaviopsis root rot (Thielaviopsis basicola).

It is also possible to control resistant strains of the organisms mentioned above.

Microorganisms capable of degrading or changing the industrial materials which may be mentioned are, for example, bacteria, fungi, yeasts, algae and slime organisms. The active compounds according to the invention preferably act against fungi, in particular moulds, wood-discolouring and wood-destroying fungi (Basidiomycetes) and against slime organisms and algae. Microorganisms of the following genera may be mentioned as examples: Alternaria, such as Alternaria tenuis, Aspergillus, such as Aspergillus niger, Chaetomium, such as Chaetomium globosum, Coniophora, such as Coniophora puetana, Lentinus, such as Lentinus tigrinus, Penicillium, such as Penicillium glaucum, Polyporus, such as Polyporus versicolor, Aureobasidium, such as Aureobasidium pullulans, Sclerophoma, such as Sclerophoma pityophila, Trichoderma, such as Trichoderma viride, Escherichia, such as Escherichia coli, Pseudomonas, such as Pseudomonas aeruginosa, and Staphylococcus, such as Staphylococcus aureus.

In addition, the compounds of the formula (I) according to the invention also have very good antimycotic activity. They have a very broad antimycotic activity spectrum in particular against dermatophytes and yeasts, moulds and diphasic fungi (for example against Candida species such as Candida albicans, Candida glabrata) and Epidermophyton floccosum, Aspergillus species such as Aspergillus niger and Aspergillus fumigatus, Trichophyton species such as Trichophyton mentagrophytes, Microsporon species such as Microsporon canis and audouinii. The list of these fungi by no means limits the mycotic spectrum which can be covered, but is only for illustration.

When applying the compounds according to the invention the application rates can be varied within a broad range. The dose of active compound/application rate usually applied in the method of treatment according to the invention is generally and advantageously

- for treatment of part of plants, e.g. leafs (foliar treatment): from 0.1 to 10,000 g/ha, preferably from 10 to 1,000 g/ha, more preferably from 50 to 300g/ha; in case of drench or drip application, the dose can even be reduced, especially while using inert substrates like rockwool or perlite;
- for seed treatment: from 2 to 200 g per 100 kg of seed, preferably from 3 to 150 g per 100 kg of seed, more preferably from 2.5 to 25 g per 100 kg of seed, even more preferably from 2.5 to 12.5 g per 100 kg of seed;

- for soil treatment: from 0.1 to 10,000 g/ha, preferably from 1 to 5,000 g/ha.

The doses herein indicated are given as illustrative examples of the method according to the invention. A person skilled in the art will know how to adapt the application doses, notably according to the nature of the plant or crop to be treated.

The combination according to the invention can be used in order to protect plants within a certain time range after the treatment against pests and/or phytopathogenic fungi and/or microorganisms. The time range, in which protection is effected, spans in general 1 to 28 days, preferably 1 to 14 days, more preferably 1 to 10 days, even more preferably 1 to 7 days after the treatment of the plants with the combinations or up to 200 days after the treatment of plant propagation material.

Furthermore combinations and compositions according to the invention may also be used to reduce the contents of mycotoxins in plants and the harvested plant material and therefore in foods and animal feed stuff made therefrom. Especially but not exclusively the following mycotoxins can be specified: Deoxynivalenole (DON), Nivalenole, 15-Ac-DON, 3-Ac-DON, T2- und HT2- Toxins, Fumonisines, Zearalenone Moniliformine, Fusarine, Diaceotoxyscirpenole (DAS), Beauvericine, Enniatine, Fusaroproliferine, Fusarenole, Ochratoxines, Patuline, Ergotalkaloides und Aflatoxines, which are caused for example by the following fungal diseases: *Fusarium spec.*, like *Fusarium acuminatum, F. avenaceum, F. crookwellense, F. culmorum, F. graminearum (Gibberella zeae), F. equiseti, F. fujikoroi, F. musarum, F. oxysporum, F. proliferatum, F. poae, F. pseudograminearum, F. sambucinum, F. scirpi, F. semitectum, F. solani, F. sporotrichoides, F. langsethiae, F. subglutinans, F. tricinctum, F. verticillioides* and others but also by *Aspergillus spec.*, *Penicillium spec.*, *Claviceps purpurea, Stachybotrys spec.* and others.

The good fungicidal activity of the active compound combinations according to the invention is evident from the example below. While the individual active compounds exhibit weaknesses with regard to the fungicidal activity, the combinations have an activity which exceeds a simple addition of activities.
A synergistic effect of fungicides is always present when the fungicidal activity of the active compound combinations exceeds the total of the activities of the active compounds when applied individually.

The expected activity for a given combination of two active compounds can be calculated as follows (cf. Colby, S.R., "Calculating Synergistic and Antagonistic Responses of Herbicide Combinations", *Weeds* **1967**, *15*, 20-22):

If

X is the efficacy when active compound A is applied at an application rate of m ppm (or g/ha),

Y is the efficacy when active compound B is applied at an application rate of n ppm (or g/ha),

E is the efficacy when the active compounds A and B are applied at application rates of m and n ppm (or g/ha), respectively, and

then $E = X + Y - \frac{X \cdot Y}{100}$

The degree of efficacy, expressed in % is denoted. 0 % means an efficacy which corresponds to that of the control while an efficacy of 100 % means that no disease is observed.

If the actual fungicidal activity exceeds the calculated value, then the activity of the combination is superadditive, i.e. a synergistic effect exists. In this case, the efficacy which was actually observed must be greater than the value for the expected efficacy (E) calculated from the abovementioned formula.

A further way of demonstrating a synergistic effect is the method of Tammes (cf. "Isoboles, a graphic representation of synergism in pesticides" in *Neth. J. Plant Path.*, **1964**, *70*, 73-80).

The invention is illustrated by the examples below. However, the invention is not limited to the examples.

Examples

2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2,6-difluoro-4-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone (I-4)

***tert*-butyl 4-{4-[5-(2,6-difluoro-4-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidine-1-carboxylate**

To a solution of *tert*-butyl 4-{4-[(Z/E)-(hydroxyimino)methyl]-1,3-thiazol-2-yl}piperidine-1-carboxylate (1.75 g) and 3,5-difluoro-4-vinylphenol (1.05 g) in ethyl acetate (45 ml) were added, at room temperature, potassium bicarbonate (2.81 g) and N-chlorosuccinimide (0.90 g), and then one drop of water. The reaction mixture was stirred at 60°C for 4 hours, then admixed with ethyl acetate and water and extracted with ethyl acetate. The organic extracts were dried over sodium sulphate and concentrated under reduced pressure. The residue was purified by chromatography. This gave *tert*-butyl 4-{4-[5-(2,6-difluoro-4-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidine-1-carboxylate (0.62 g).

^{1}H NMR (DMSO-d_6, 400 MHz): δ_{ppm} : 1.41 (s, 9H), 1.48-1.62 (m, 2H), 1.98-2.08 (m, 2H), 2.81-2.96 (m, 2H), 3.45 (dd, 1H), 3.80 (dd, 1H), 3.96-4.06 (m, 2H), 5.87 (dd, 1H), 6.50 (m, 2H), 7.98 (s, 1H), 10.50 (s, 1H)

logP (HCOOH): 3,24

MS (ESI): 366 ([M-$C(CH_3)_3OCO$+H]$^+$)

4-{4-[5-(2,6-difluoro-4-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidinium chloride

To a solution of *tert*-butyl 4-{4-[5-(2,6-difluoro-4-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidine-1-carboxylate (620 mg) in dichloromethane (4 ml) was added dropwise, at 0°C, a 4 molar solution of hydrogen chloride in 1,4-dioxane (8.5 ml). The reaction mixture was stirred at 0°C and then gradually warmed to room temperature. After stirring for 3 h at room temperature, the solvent and excess hydrogen chloride were removed. This gave 4-{4-[5-(2,6-difluoro-4-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidinium chloride (492 mg).

^{1}H NMR (DMSO-d_6, 400 MHz): δ_{ppm} : 1.41 (s, 9H), 1.48-1.62 (m, 2H), 1.98-2.08 (m, 2H), 2.81-2.96 (m, 2H), 3.45 (dd, 1H), 3.80 (dd, 1H), 3.96-4.06 (m, 2H), 5.87 (dd, 1H), 6.50 (m, 2H), 7.98 (s, 1H), 10.50 (s, 1H)

logP (HCOOH): 0.98

MS (ESI): 366 ([M-Cl+H]$^+$)

2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-(4-{4-[5-(2,6-difluoro-4-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)ethanone

Solution A: To a solution of [3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]acetic acid (305 mg) in dichloromethane (10 ml) were added dropwise, at room temperature, one drop of N,N-dimethylformamide and oxalyl chloride (0.320 ml). After stirring at room temperature for two hours, the solvent was removed and the residue was dissolved again in dichloromethane (5 ml) (solution A).

To a solution of 4-{4-[5-(2,6-difluoro-4-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidinium chloride (492 mg) in dichloromethane (14 ml) was added, at room temperature, triethylamine (1.7 ml). After 15 minutes, solution A was added dropwise. After stirring at room temperature overnight, the reaction mixture was admixed with water and extracted with ethyl acetate. The organic extracts were dried over sodium sulphate and concentrated under reduced pressure. The residue was purified by chromatography. This gave 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-(4-{4-[5-(2,6-difluoro-4-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)ethanone (360 mg).

^{1}H NMR (DMSO-d_6, 400 MHz): δ_{ppm} : 1.51-1.61 (m, 1H), 1.77-1.85 (m, 1H), 2.06-2.17 (m, 2H), 2.79-2.87 (m, 1H), 3.23-3.31 (m, 1H), 3.46 (dd, 1H), 3.81 (dd, 1H), 3.93-4.00 (m, 1H), 4.31-4.39 (m, 1H),

5.32-5.48 (m, 2H), 5.88 (dd, 1H), 6.49 (m, 2H), 6.91 (s, 1H), 7.04 (t, 1H), 7.18 (t, 1H), 8.01 (s, 1H), 10.72 (s, 1H)

logP (HCOOH): 2.58

MS (ESI): 574 ($[M+H]^+$)

2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2,6-difluoro-4-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone

To a solution of 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-(4-{4-[5-(2,6-difluoro-4-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)ethanone (384 mg) and potassium carbonate (138 mg) in N,N-dimethylformamide (18 ml) are added, at room temperature, potassium iodide (61 mg) and 3-bromoprop-1-yne (127 mg) . The reaction mixture is stirred at 80°C for 9 h. Then the mixture is admixed with dilute hydrochloric acid and extracted with ethyl acetate. The combined organic phases are dried over sodium sulphate and concentrated. Purification by column chromatography gives 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2,6-difluoro-4-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone (60 mg).

^{1}H NMR (DMSO-d_6, 400 MHz): δ_{ppm} : 1.51-1.65 (m, 1H), 1.74-1.88 (m, 1H), 2.05-2.19 (m, 2H), 2.80-2.91 (m, 1H), 3.50 (dd, 1H), 3.65 (t, 1H), 3.85 (dd, 1H), 3.93-4.03 (m, 1H), 4.31-4.41 (m, 1H), 4.88 (d, 2H), 5.31-5.48 (m, 2H), 5.92 (dd, 1H), 6.85 (m, 2H), 6.90 (s, 1H), 7.02 (t, 1H), 7.18 (t, 1H), 8.02 (s, 1H)

logP (HCOOH): 3.30

MS (ESI): 612 ($[M+H]^+$)

2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2,6-difluoro-3-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone (I-7)

tert-b u t y l 4-{4-[5-(2,6-difluoro-3-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidine-1-carboxylate

To a solution of *tert*-butyl 4-{4-[(hydroxyimino)methyl]-1,3-thiazol-2-yl}piperidine-1-carboxylate (1.278 g) in ethyl acetate (80 ml) was added, at room temperature, N-chlorosuccinimide (658 mg). After stirring at 60°C for 30 min, 2,4-difluoro-3-vinylphenol (705 mg), potassium hydrogencarbonate (822 mg) and then one drop of water were added, at room temperature, to the reaction mixture. After stirring overnight

at room temperature, the reaction mixture was admixed with ethyl acetate and water and extracted with ethyl acetate. The organic extracts were dried over sodium sulphate and concentrated under reduced pressure. The residue was purified by chromatography. This gave tert-butyl 4-{4-[5-(2,6-difluoro-3-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidine-1-carboxylate (658 mg).

^{1}H NMR (DMSO-d_6, 400 MHz): δ_{ppm} : 9.92 (s, 1H), 8.01 (s, 1H), 7.04-6.90 (m, 2H), 5.96 (dd, 1H), 4.01 (bd, 2H), 3.94-3.84 (m, 1H), 3.50 (dd, 1H), 2.10-2.00 (m, 2H), 1.63-1.50 (m, 2H), 1.42 (s, 9H)

2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-(4-{4-[5-(2,6-difluoro-3-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)ethanone

To a solution of tert-butyl 4-{4-[5-(2,6-difluoro-3-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidine-1-carboxylate (3.92 g) in dichloromethane (15 ml) was added dropwise, at 0°C, a 4 molar solution of hydrogen chloride (10 eq.) in 1,4-dioxane. The reaction mixture was stirred at 0°C and then gradually warmed to room temperature. After stirring for 5 hours, the solvent and excess hydrogen chloride were removed. This gave 4-{4-[5-(2,6-difluoro-3-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidinium chloride. (compound A)

To a solution of [3,5-bis-(difluoromethyl)-1H-pyrazol-1-yl]acetic acid (2 g) in dichloromethane (40 ml) are added, at 0°C, oxalyl chloride (3.273 g) and one drop of N,N-dimethylformamide. The reaction mixture is stirred at room temperature for 2 hours. The solvent and the excess reagent are removed under reduced pressure. The solid residue is again dissolved in dichloromethane (15 ml) and, at 0°C, added dropwise to a solution of 4-{4-[5-(2,6-difluoro-3-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidinium chloride (compound A) and triethylamine (5.0 eq.) in dichloromethane (100 ml). The reaction mixture is stirred at room temperature overnight. Then it is admixed with concentrated sodium hydrogencarbonate solution, and the aqueous phase is removed and extracted with ethyl acetate. The combined organic phases are dried over sodium sulphate and concentrated. Purification by column chromatography gives 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-(4-{4-[5-(2,6-difluoro-3-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)ethanone (1.818 g).

^{1}H NMR (DMSO-d_6, 400 MHz): δ_{ppm} : 9.91 (s, 1H), 8.03 (s, 1H), 7.18 (t, 1H), 7.03 (t, 1H), 7.02-6.88 (m, 3H), 5.96 (dd, 1H), 5.40 (q, 2H), 4.36 (bd, 1H), 4.02-3.84 (m, 2H), 3.55 (dd, 1H), 3.45-3.22 (m, 2H), 2.84 (t, 1H), 2.11 (t, 2H), 1.88-1.75 (m, 1H), 1.65-1.50 (m, 1H)

logP (HCOOH): 2.61

2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2,6-difluoro-3-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

To a solution of 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-(4-{4-[5-(2,6-difluoro-3-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)ethanone (1.82 g) and potassium carbonate (657 mg) in N,N-dimethylformamide (15 ml)are added, at room temperature, potassium iodide (289 mg) and 3-bromoprop-1-yne (755 mg)) (80 wt %in toluene). The reaction mixture is stirred at 80°C for 4 h. Then the mixture is admixed with saturated aqueous solution of ammonium chloride and extracted with ethyl acetate. The combined organic phases are dried over sodium sulphate and concentrated. Purification by column chromatography gives 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2,6-difluoro-3-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone, (1.68 g).

^{1}H NMR (DMSO-d_6, 400 MHz): δ_{ppm} : 8.03 (s, 1H), 7.46-7.26 (m, 1H), 7.18 (t, 1H), 7.20-7.08 (m, 1H), 7.03 (t, 1H), 6.91 (s, 1H), 5.99 (dd, 1H), 5.40 (q, 2H), 4.89 (d, 2H), 4.35 (bs, 1H), 4.06-3.85 (m, 2H), 3.64 (t, 1H), 3.54 (dd, 1H), 3.46-3.21 (m, 2H), 2.84 (t, 1H), 2.12 (t, 2H), 1.89-1.75 (m, 1H), 1.65-1.50 (m, 1H).

logP (HCOOH): 3.17

The following examples can be synthesized accordingly:

(I-1) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone log p: 3,24[b]; 3,34[c]

(I-2) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[4-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone log p: 3,08[b]; 3,14[c]

(I-3) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[3-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone log p: 3,16[b]; 3,24[c]

(I-5) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-fluoro-6-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone log p: 3,15[b]; 3,18[c]

(I-6) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-chloro-6-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone log p: 3,51[a]; 3,4[b]

(I-8) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[5-fluoro-2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone log p: 3,37[b]; 3,44[c]

(I-9) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[4-methoxy-2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone log p: 3,25[b]; 3,2[c]

(I-10) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[3-fluoro-2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone log p: 3,37[b]; 3,48[c]

Measurement of logP values was performed according EEC directive 79/831 Annex V.A8 by HPLC (High Performance Liquid

Chromatography) on reversed phase columns with the following methods:

[a] Measurement was done at pH 2.3 with 0,1% phosphoric acid and acetonitrile as eluent.

[b]measurement of LC-MS was done at pH 2,7 with 0,1 % formic acid in water and with acetonitrile (contains 0,1% formic acid) as eluent with a linear gradient from 10 % acetonitrle to 95 % acetonitrile.

[c] Measurement with LC-MS was done at pH 7.8 with 0,001 molar ammonium hydrogen carbonate solution in water as eluent with a linear gradient from 10 % acetonitrile to 95 % acetonitrile.

Calibration was done with not branched alkan2-ones (with 3 to 16 carbon atoms) with known logP-values (measurement of logP values using retention times with linear interpolation between successive alkanones).. lambda-maX-values were determined using UV-spectra from 200 nm to 400 nm and the peak values of the chromatographic signals.

NMR Peak lists

1H-NMR data of selected examples are written in form of 1H-NMR-peak lists. To each signal peak are listed the δ-value in ppm and the signal intensity with space as delimiter. Between the δ-value – signal intensity pairs are semicolons as delimiters.

The peak list of an example has therefore the form:

δ_1 intensity$_1$;δ_2 intensity$_2$;.....;δ_i intensity$_i$;.....; δ_n intensity$_n$

The solvent in which the NMR spectrum was measured is written in squared brackets behind the example number and prior to the NMR-Peak list

Example No. I-1 [DMSO-D6] 8.0055 16.00;7.3472 1.39;7.3429 1.89;7.3238 8.76;7.3048 10.15;7.1707 5.98;7.1567 3.82;7.1514 4.37;7.1317 3.60;7.0375 2.99;7.0210 8.97;7.0035 4.27;6.9848 2.03;6.8977 5.49;6.8852 3.32;5.8869 2.12;5.8691 2.50;5.8594 2.52;5.8413 2.24;5.4480 1.14;5.4048 4.22;5.3631 4.23;5.3208 1.12;4.8765 12.42;4.8706 12.41;4.3586 1.31;4.3257 1.38;3.9762 1.35;3.9425 1.47;3.8964 2.48;3.8686 2.86;3.8534 3.19;3.8257 2.87;3.7713 0.39;3.7658 0.37;3.7408 0.35;3.7236 0.39;3.6946 0.41;3.6901 0.44;3.6139 0.50;3.6009 0.57;3.5655 3.69;3.5596 7.65;3.5537 3.68;3.5269 0.74;3.5095 0.83;3.4837 1.00;3.4673 1.14;3.4479 1.33;3.4029 3.19;3.3743 6.16;3.3121 5148.85;3.2885 58.37;3.2715 8.09;3.2534 5.49;3.2284 4.06;3.2105 3.16;3.1748 0.37;2.8624 0.95;2.8325 1.66;2.8060 1.01;2.6952 0.56;2.6787 1.83;2.6741 3.46;2.6695 4.52;2.6649 3.37;2.6603 1.74;2.6277 0.54;2.5395 5.91;2.5227 18.48;2.5094 256.55;2.5050 482.43;2.5005 633.82;2.4960

435.65;2.4916 205.46;2.3364 1.51;2.3317 3.16;2.3272 4.18;2.3225 3.02;2.3179 1.43;2.1278 1.15;2.0948 2.38;2.0688 10.42;1.9078 0.32;1.8353 0.55;1.8047 1.09;1.7818 0.95;1.7727 0.92;1.7518 0.40;1.7445 0.38;1.5999 0.49;1.5800 1.01;1.5699 1.05;1.5486 1.04;1.5398 1.01;1.5191 0.45;1.2356 0.80;0.8904 0.61;0.0080 2.38;-0.0002 56.69;-0.0084 2.00
Example No. I-2 [DMSO-D_6] 9.9022 0.44;8.7772 0.50;8.6463 0.42;8.0130 16.00;7.7728 0.64;7.7581 0.33;7.7407 0.50;7.5929 0.52;7.3484 9.21;7.3313 4.39;7.3267 10.28;7.3088 3.30;7.2042 0.38;7.1754 7.08;7.1595 3.59;7.0421 3.74;7.0234 8.65;7.0126 11.26;7.0076 4.29;6.9955 3.95;6.9907 9.69;6.9573 0.62;6.9001 7.60;6.8876 4.10;5.7464 13.29;5.6954 2.45;5.6739 3.26;5.6688 2.96;5.6472 2.43;5.4524 1.52;5.4104 5.36;5.3688 5.44;5.3262 1.43;4.8008 14.95;4.7949 14.86;4.7407 0.94;4.3647 1.74;4.3317 1.80;4.0571 0.80;4.0392 2.27;4.0214 2.32;4.0037 1.21;3.9850 1.69;3.9517 1.80;3.8530 2.59;3.8260 2.95;3.8100 3.38;3.7831 2.88;3.5499 3.63;3.5440 7.26;3.5382 3.57;3.4766 0.33;3.4424 0.49;3.4165 1.72;3.4070 1.58;3.3895 5.58;3.3785 2.68;3.3685 4.75;3.3595 2.82;3.3469 4.70;3.3252 7.94;3.3047 416.16;3.2810 7.73;3.2426 1.41;3.0372 0.33;2.8752 1.34;2.8491 2.27;2.8170 1.23;2.6737 0.74;2.6693 1.21;2.6648 0.70;2.5390 1.68;2.5087 48.88;2.5045 86.78;2.5000 110.03;2.4957 76.72;2.3313 0.55;2.3268 0.72;2.3222 0.49;2.1375 1.59;2.1049 3.18;2.0691 2.49;1.9868 9.24;1.9080 0.66;1.8444 0.72;1.8229 1.38;1.8154 1.43;1.7920 1.34;1.7626 0.56;1.6213 0.60;1.6144 0.71;1.5938 1.36;1.5841 1.46;1.5630 1.36;1.5542 1.28;1.5340 0.60;1.2366 0.62;1.1927 2.59;1.1749 5.02;1.1571 2.49;-0.0002 5.18
Example No. I-3 [DMSO-D_6] 8.0183 1.38;7.3327 0.53;7.1725 0.58;7.0218 0.70;7.0082 0.35;6.9906 0.80;6.8999 0.59;6.8859 0.33;5.7441 7.03;5.4070 0.43;5.3656 0.46;4.8067 1.20;4.8008 1.20;4.3506 0.38;4.3380 0.69;4.3252 0.44;4.0903 0.34;4.0772 0.36;4.0572 1.22;4.0394 3.66;4.0216 3.70;4.0038 1.27;3.5397 0.39;3.5338 0.72;3.5281 0.38;3.4750 0.33;3.4622 0.37;3.4575 0.64;3.4448 0.70;3.4401 0.74;3.4273 0.79;3.4226 0.61;3.4098 0.68;3.3964 1.04;3.3757 1.59;3.3299 662.84;3.3068 6.66;3.1773 1.22;3.1642 1.18;2.6708 0.41;2.5408 0.57;2.5240 1.51;2.5106 21.47;2.5063 40.33;2.5018 52.87;2.4974 36.58;2.4930 17.42;2.4636 0.33;2.4454 0.49;2.4280 0.46;2.3285 0.36;2.0685 0.90;1.9869 16.00;1.1930 4.40;1.1752 8.70;1.1574 4.29;1.0748 0.93;1.0572 1.77;1.0398 0.88;0.9521 1.12;0.9343 2.20;0.9165 1.07;-0.0002 0.67
Example No. I-5 [DMSO-D_6] 7.9681 16.00;7.4330 1.50;7.4160 1.98;7.4119 3.10;7.3952 3.13;7.3910 1.89;7.3739 1.51;7.3085 2.56;7.1750 5.80;7.1585 2.74;7.0418 2.83;7.0226 6.92;7.0121 4.36;6.9908 3.84;6.9093 3.01;6.9008 5.87;6.8865 5.33;6.8644 1.87;6.0740 1.94;6.0516 2.36;6.0436 2.19;6.0213 1.96;5.4545 1.14;5.4110 4.19;5.3690 4.16;5.3271 1.09;4.8870 0.53;4.8816 0.59;4.8472 6.66;4.8417 10.99;4.8361 6.08;4.8020 0.48;4.7962 0.58;4.3673 1.31;4.3338 1.42;3.9904 1.39;3.9536 1.47;3.8311 0.43;3.8095 1.58;3.7769 1.77;3.7681 2.13;3.7375 1.93;3.5278 3.35;3.5207 4.59;3.5148 8.43;3.5088 5.00;3.4848 3.01;3.4631 3.39;3.3942 7.50;3.3307 5101.71;3.3077 39.28;3.2505 2.33;3.2140 0.93;3.1513 0.33;2.8803 0.83;2.8505 1.57;2.8219 0.84;2.6753 1.19;2.6708 1.61;2.6661 1.17;2.6613 0.59;2.5407 2.04;2.5107 94.07;2.5063 176.46;2.5017 231.85;2.4973 160.85;2.4929 77.91;2.3331 1.24;2.3283 1.57;2.1548 1.15;2.1171 2.28;2.0796 1.44;2.0684 11.58;1.8497 0.53;1.8211 1.07;1.7995 1.06;1.6243 0.49;1.5944 1.06;1.5722 1.05;1.5414 0.42;1.2375 0.37;-0.0002 12.57
Example No. I-6 [DMSO-D_6] 7.9699 10.61;7.4071 2.41;7.3934 4.66;7.3796 3.07;7.2752 1.62;7.1866 3.78;7.1592 4.04;7.1538 4.69;7.1452 3.55;7.1404 4.18;7.1317 1.81;7.0981 1.82;7.0412 4.24;6.9510 1.99;6.9167 4.54;6.2241 1.96;6.2077 2.40;6.2036 2.22;6.1871 1.98;5.7656 16.00;5.4603 1.61;5.4319 3.45;5.3819 3.39;5.3536 1.59;4.8286 0.82;4.8247 0.79;4.8020 3.81;4.7981 3.85;4.7899 3.79;4.7861 3.61;4.7633 0.81;4.7594 0.80;4.3670 1.08;4.3451 1.11;4.0452 0.51;4.0334 1.53;4.0215 1.55;4.0097 0.53;3.9852 1.04;3.9628 1.11;3.7541 1.50;3.7334 1.91;3.7262 2.29;3.7056 1.88;3.5693 2.07;3.5530 2.10;3.5414 1.63;3.5251 1.59;3.4631 2.42;3.4592 4.73;3.4554 2.22;3.4198 0.46;3.4137 0.81;3.4074 0.57;3.4008 0.99;3.3946 1.65;3.3883 1.06;3.3754 1.57;3.3523 274.08;3.3299 1.08;3.2952 0.77;3.2912 0.87;3.2716 1.51;3.2523 0.85;3.2486 0.70;2.8618 0.76;2.8431 1.38;2.8236 0.77;2.6180 0.64;2.6151 0.84;2.6121 0.61;2.5428 0.39;2.5241 2.50;2.5211 3.45;2.5062 103.50;2.5033 133.72;2.5004 96.81;2.3904 0.69;2.3875 0.88;2.3846 0.64;2.1497 0.99;2.1296 1.16;2.1078 1.06;2.0877 1.09;2.0787 0.92;1.9906 6.59;1.8398 0.37;1.8207 0.88;1.8017 0.83;1.6093 0.33;1.6029

0.39;1.5892 0.87;1.5828 0.90;1.5688 0.88;1.5627 0.83;1.5490 0.35;1.1858 1.79;1.1740 3.53;1.1622 1.75;0.0051 0.44;-0.0002 8.35
Example No. I-8 [DMSO-D_6] 8.2694 0.37;8.0297 16.00;7.9423 0.34;7.3091 2.84;7.1813 6.20;7.1772 11.27;7.1662 10.80;7.1624 8.45;7.0958 2.91;7.0732 3.19;7.0426 3.23;7.0294 7.49;6.9051 6.34;6.8935 3.90;5.8645 2.29;5.8471 2.58;5.8369 2.65;5.8193 2.37;5.4555 1.50;5.4132 5.05;5.3703 4.97;5.3273 1.58;4.8808 13.15;4.8749 13.81;4.3601 1.47;4.3275 1.57;3.9771 1.37;3.9407 1.52;3.9294 2.96;3.9015 2.87;3.8861 3.23;3.8584 2.64;3.6039 2.94;3.5981 6.75;3.5921 3.20;3.4144 0.70;3.4048 1.16;3.3952 0.96;3.3853 1.40;3.3759 2.57;3.3666 1.96;3.3337 316.84;3.3303 523.70;3.3286 460.30;3.3252 593.19;3.2919 6.64;3.2742 4.45;3.2582 2.69;3.2487 4.11;3.2310 4.04;3.1993 0.56;3.1490 0.35;3.1246 0.33;2.8581 1.12;2.8268 1.93;2.7999 1.08;2.6796 0.53;2.6753 1.26;2.6707 1.76;2.6660 1.35;2.5409 1.12;2.5240 3.16;2.5106 90.30;2.5061 191.47;2.5015 264.57;2.4969 200.78;2.4925 103.79;2.3329 1.42;2.3283 1.93;2.3238 1.50;2.1244 1.34;2.0912 2.76;2.0736 13.65;2.0591 1.66;1.8417 0.52;1.8317 0.61;1.8123 1.21;1.8025 1.29;1.7812 1.18;1.7728 1.17;1.7501 0.51;1.6054 0.50;1.5955 0.62;1.5739 1.21;1.5645 1.36;1.5442 1.21;1.5343 1.19;1.5136 0.52;1.5038 0.44;1.2353 0.90;0.1460 0.45;0.0081 3.18;-0.0002 106.36;-0.0084 5.20;-0.1499 0.45
Example No. I-9 [DMSO-D_6] 9.7648 0.40;7.9977 5.78;7.9717 0.36;7.3105 1.24;7.2239 2.35;7.2028 2.50;7.1771 2.83;7.1657 1.46;7.0442 1.45;7.0299 3.16;6.9057 3.58;6.8943 1.72;6.7107 2.56;6.7047 2.70;6.5880 1.61;6.5824 1.35;6.5667 1.43;6.5612 1.25;5.8121 0.94;5.7933 1.12;5.7844 1.16;5.7656 1.11;5.4587 0.72;5.4144 2.49;5.3719 2.50;5.3292 0.88;4.8596 4.64;4.8539 4.69;4.3610 0.80;4.3280 0.83;4.0557 0.50;4.0382 1.43;4.0203 1.50;4.0018 0.54;3.9815 0.81;3.9460 0.83;3.8409 0.48;3.8294 0.40;3.8150 0.97;3.7878 1.26;3.7721 1.29;3.7534 16.00;3.6856 1.58;3.5763 1.35;3.5708 2.96;3.4146 0.49;3.4061 0.72;3.3766 1.59;3.3657 1.55;3.3367 262.16;3.3302 692.11;3.2913 1.36;3.2802 1.61;3.2608 2.29;3.2369 1.33;3.2187 1.11;2.8610 0.54;2.8343 1.02;2.8008 0.58;2.7985 0.47;2.6712 1.05;2.5415 0.45;2.5018 180.11;2.3285 1.07;2.1308 0.74;2.0978 1.42;2.0732 1.60;2.0602 0.78;1.9885 5.87;1.8153 0.67;1.8089 0.69;1.7838 0.61;1.7769 0.59;1.5781 0.62;1.5699 0.66;1.5476 0.66;1.5404 0.57;1.3973 0.52;1.2589 0.38;1.2367 0.91;1.1923 1.51;1.1746 2.97;1.1568 1.53;0.8684 0.36;0.8490 0.45;0.8303 0.33;-0.0002 10.43
Example No. I-10 [DMSO-D_6] 8.8000 0.35;8.0314 16.00;8.0258 0.56;7.3002 1.37;7.2954 1.51;7.2887 1.57;7.2839 2.00;7.2810 1.63;7.2724 3.50;7.2647 1.91;7.2587 0.45;7.1955 0.88;7.1824 8.23;7.1755 8.85;7.1706 6.38;7.1683 4.98;7.1624 1.02;7.1294 2.47;7.0939 2.49;7.0390 6.09;6.9487 2.81;6.9145 5.99;5.9825 2.63;5.9702 2.96;5.9639 2.84;5.9516 2.64;5.4543 2.00;5.4259 4.37;5.3764 4.54;5.3480 2.07;4.8469 12.91;4.8429 12.80;4.3581 1.42;4.3361 1.43;4.0454 0.68;4.0335 1.99;4.0217 2.00;4.0099 0.69;3.9754 1.36;3.9469 3.25;3.9281 2.81;3.9181 2.98;3.8995 2.46;3.6563 3.62;3.6524 7.40;3.6484 3.44;3.4078 1.31;3.4019 1.98;3.3887 2.94;3.3825 4.59;3.3761 5.15;3.3509 1174.43;3.3311 6.48;3.3273 18.77;3.3192 3.56;3.3068 0.53;3.2844 1.13;3.2807 1.28;3.2611 2.01;3.2418 1.16;3.1708 0.76;3.1622 0.74;2.8500 1.05;2.8299 1.79;2.8120 1.06;2.6180 1.96;2.6150 2.59;2.6120 1.91;2.6091 0.99;2.5427 2.69;2.5242 8.11;2.5211 10.12;2.5179 11.89;2.5091 139.51;2.5062 280.13;2.5032 371.18;2.5002 269.11;2.4973 124.42;2.3933 0.95;2.3904 1.85;2.3874 2.43;2.3844 1.74;2.1262 1.29;2.1054 1.53;2.0868 1.43;2.0782 5.17;2.0671 1.39;1.9905 8.79;1.8320 0.51;1.8253 0.60;1.8114 1.17;1.8053 1.27;1.7905 1.21;1.7847 1.11;1.7707 0.52;1.7643 0.41;1.5910 0.47;1.5847 0.57;1.5708 1.17;1.5644 1.23;1.5504 1.20;1.5442 1.11;1.5301 0.49;1.5239 0.41;1.3969 3.62;1.2337 1.97;1.1860 2.41;1.1741 4.71;1.1623 2.36;0.8535 0.32;0.0966 0.33;0.0052 3.55;-0.0002 79.84;-0.0057 2.64

NMR Peak list method, further details

Further details of NMR-data description with peak lists you find in the publication „ Citation of NMR Peaklist Data within Patent Applications “:

http://www.rdelectronic.co.uk/rd/free/RD564025.pdf

Biological Examples

Phytophthora test (tomatoes) / preventive

Solvent: 24.5 parts by weight of acetone

24.5 parts by weight of dimethylacetamide

Emulsifier: 1 part by weight of alkylaryl polyglycol ether

To produce a suitable preparation of active compound, 1 part by weight of active compound is mixed with the stated amounts of solvent and emulsifier, and the concentrate is diluted with water to the desired concentration.

To test for preventive activity, young plants are sprayed with the preparation of active compound at the stated rate of application. After the spray coating has dried on, the plants are inoculated with an aqueous spore suspension of ***Phytophthora infestans***. The plants are then placed in an incubation cabinet at approximately 20 °C and a relative atmospheric humidity of 100%.

The test is evaluated 3 days after the inoculation. 0% means an efficacy which corresponds to that of the untreated control, while an efficacy of 100% means that no disease is observed.

The table below clearly shows that the observed activity of the active compound combination according to the invention is greater than the calculated activity, i.e. a synergistic effect is present.

Table 1

Phytophthora test (tomatoes) / protective

Active compounds		Application rate of active compound in ppm a.i.	Efficacy in %	
			found*	calc.**
(I-1)	2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone	0,01	0	
(I-5)	2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-fluoro-6-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone	0,01	62	
3.1	ametoctradin	10	0	
9.5	mandipropamid	0,2	0	
14.4	fluazinam	10	0	
15.9	cymoxanil	10	0	
15.24	fosetal-Al	10	0	
15.41	phosphorous acid	10	0	
(I-5) + 3.1	1:1000	0,01 + 10	94	62
(I-1) + 9.5	1:20	0,01 + 0,2	75	0
(I-5) + 9.5	1:20	0,01 + 0,2	95	62
(I-5) + 14.4	1:1000	0,01 + 10	100	62
(I-5) + 15.9	1:1000	0,01 + 10	83	62
(I-1) + 15.24	1:1000	0,01 + 10	80	0
(I-5) + 15.41	1:1000	0,01 + 10	84	62

* found = activity found

** calc. = activity calculated using Colby's formula

Table 2

Phytophthora test (tomatoes) / protective

Active compounds		Application rate of active compound in ppm a.i.	Efficacy in %	
			found*	calc.**
(I-1)	2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone	0,01 0,0025	42 52	
(I-5)	2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-fluoro-6-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone	0,005	43	
3.10	fenamidone	0,25	6	
5.8	copper oxychloride	10 5	10 12	
5.16	folpet	10 5	3 3	
5.25	metiram	10 5	24 12	
10.10	propamocarb-HCl	5	7	
15.60	2,6-dimethyl-1H,5H-[1,4]dithiino[2,3-c:5,6-c']dipyrrole-1,3,5,7(2H,6H)-tetrone	5	49	
(I-1) + 3.10	1:100	0,0025 + 0,25	74	55
(I-1) + 5.8	1:1000	0,01 + 10	77	48
(I-5) + 5.8	1:1000	0,005 + 5	63	50
(I-1) + 5.16	1:1000	0,01 + 10	56	44
(I-5) + 5.16	1:1000	0,005 + 5	58	45
(I-1) + 5.25	1:1000	0,01 + 10	95	56
(I-5) + 5.25	1:1000	0,005 + 5	60	50
(I-5) + 10.10	1:1000	0,005 + 5	63	47
(I-5) + 15.60	1:1000	0,005 + 5	85	71

* found = activity found

** calc. = activity calculated using Colby's formula

Table 3

Phytophthora test (tomatoes) / protective

Active compounds		Application rate of active compound in ppm a.i.	Efficacy in %	
			found*	calc.**
(I-1)	2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone	0,01	29	
5.29	propineb	10	24	
7.7	pyrimethanil	10	10	
(I-1) + 5.29	1:1000	0,01 + 10	61	46
(I-1) + 7.7	1:1000	0,01 + 10	50	36

* found = activity found

** calc. = activity calculated using Colby's formula

Table 4

Phytophthora test (tomatoes) / protective

Active compounds		Application rate of active compound in ppm a.i.	Efficacy in %	
			found*	calc.**
(I-1)	2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone	0,01	15	
(I-6)	2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-chloro-6-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone	0,005	35	
3.3	azoxystrobin	1	0	
3.12	fluoxastrobin	2 1	0 0	
3.17	pyraclostrobin	2 1	0 0	
3.22	trifloxystrobin	2 1	0 0	
10.10	propamocarb-HCl	10	18	
5.30	sulphur	10 5	0 0	
(I-6) + 3.3	200:1	0,005 + 1	65	35
(I-1) + 3.12	200:1	0,01 + 2	60	15
(I-6) + 3.12	200:1	0,005 + 1	68	35
(I-1) + 3.17	200:1	0,01 + 2	50	15
(I-6) + 3.17	200:1	0,005 + 1	86	35
(I-1) + 3.22	200:1	0,01 + 2	58	15
(I-6) + 3.22	200:1	0,005 + 1	65	35
(I-1) + 10.10	1:1000	0,01 + 10	75	30
(I-1) + 5.30	1:1000	0,01 + 10	50	15
(I-6) + 5.30	1:1000	0,005 + 5	55	35

* found = activity found

** calc. = activity calculated using Colby's formula

Table 5

Phytophthora test (tomatoes) / protective

Active compounds		Application rate of active compound in ppm a.i.	Efficacy in %	
			found*	calc.**
(I-1)	2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone	0,0025	64	
(I-6)	2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-chloro-6-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone	0,0025	73	
3.1	ametoctradin	2,5	52	
3.4	cyazofamid	0,1	0	
3.9	famoxadone	2,5	30	
4.6	fluopicolide	0,5	12	
(I-1) + 3.1	1:1000	0,0025 + 2,5	91	83
(I-6) + 3.4	1:40	0,0025 + 0,1	81	73
(I-1) + 3.9	1:1000	0,0025 + 2,5	92	75
(I-1) + 4.6	1:200	0,0025 + 0,5	79	68

* found = activity found

** calc. = activity calculated using Colby's formula

Example

Alternaria test (tomatoes) / preventive

Solvent:	24.5	parts by weight of acetone
	24.5	parts by weight of dimethylacetamide
Emulsifier:	1	part by weight of alkylaryl polyglycol ether

To produce a suitable preparation of active compound, 1 part by weight of active compound is mixed with the stated amounts of solvent and emulsifier, and the concentrate is diluted with water to the desired concentration.

To test for preventive activity, young plants are sprayed with the preparation of active compound at the stated rate of application. After the spray coating has dried on, the plants are inoculated with an aqueous spore suspension of ***Alternaria solani***. The plants are then placed in an incubation cabinet at approximately 20 °C and a relative atmospheric humidity of 100%.

The test is evaluated 3 days after the inoculation. 0% means an efficacy which corresponds to that of the untreated control while an efficacy of 100% means that no disease is observed.

The table below clearly shows that the observed activity of the active compound combination according to the invention is greater than the calculated activity, i.e. a synergistic effect is present.

Table 6

Alternaria test (tomatoes) / preventive

Active compounds		Application rate of active compound in ppm a.i.	Efficacy in %	
			found*	calc.**
(I-1)	2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone	100	0	
(I-5)	2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-fluoro-6-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone	50	15	
5.5	copper hydroxide	20	16	
5.23	mancozeb	10	0	
5.29	propineb	20 10	2 0	
7.7	pyrimethanil	20	4	
(I-1) + 5.5	5:1	100 + 20	50	16
(I-1) + 5.23	10:1	100 + 10	50	0
(I-1) + 5.29	5:1	100 + 20	50	2
(I-5) + 5.29	5:1	50 + 10	81	15
(I-1) + 7.7	5:1	100 + 20	56	4

* found = activity found

** calc. = activity calculated using Colby's formula

Table 7

Alternaria test (tomatoes) / preventive

Active compounds		Application rate of active compound in ppm a.i.	Efficacy in %	
			found*	calc.**
(I-1)	2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone	50	21	
(I-5)	2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-fluoro-6-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone	50	29	
5.8	copper oxychloride	25	7	
5.16	folpet	5	21	
5.25	metiram	50	36	
15.60	2,6-dimethyl-1H,5H-[1,4]dithiino[2,3-c:5,6-c']dipyrrole-1,3,5,7(2H,6H)-tetrone	25	29	
(I-1) + 5.8	2:1	50 + 25	64	27
(I-1) + 5.16	10:1	50 + 5	64	38
(I-5) + 5.16	10:1	50 + 5	80	44
(I-1) + 5.25	1:1	50 + 50	71	49
(I-1) + 15.60	2:1	50 + 25	86	44
(I-5) + 15.60	2:1	50 + 25	79	50

* found = activity found

** calc. = activity calculated using Colby's formula

Table 8

Alternaria test (tomatoes) / preventive

Active compounds		Application rate of active compound in ppm a.i.	Efficacy in %	
			found*	calc.**
(I-1)	2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone	50	30	
(I-6)	2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-chloro-6-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone	50 25	35 30	
2.1	bixafen	0,25	60	
2.8	fluxapyroxad	0,125	63	
2.12	isopyrazam	0,25	60	
2.29	benzovindiflupyr	0,25	40	
(I-1) + 2.1	200:1	50 + 0,25	84	72
(I-6) + 2.1	200:1	50 + 0,25	93	74
(I-6) + 2.8	200:1	25 + 0,125	90	74
(I-1) + 2.12	200:1	50 + 0,25	83	72
(I-1) + 2.29	200:1	50 + 0,25	91	58
(I-6) + 2.29	200:1	50 + 0,25	75	61

* found = activity found
** calc. = activity calculated using Colby's formula

Table 9

Alternaria test (tomatoes) / preventive

Active compounds		Application rate of active compound in ppm a.i.	Efficacy in %	
			found*	calc.**
(I-1)	2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone	50	18	
(I-6)	2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-chloro-6-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone	100 50	41 29	
3.3	azoxystrobin	0,25	9	
3.12	fluoxastrobin	0,5	18	
3.17	pyraclostrobin	0,25	18	
3.22	trifloxystrobin	0,25	18	
10.10	propamocarb-HCl	400 200	18 0	
5.30	sulphur	200	18	
(I-1) + 3.3	200:1	50 + 0,25	53	25
(I-6) + 3.3	200:1	50 + 0,25	53	35
(I-6) + 3.12	200:1	100 + 0,5	65	52
(I-1) + 3.17	200:1	50 + 0,25	87	33
(I-6) + 3.17	200:1	50 + 0,25	88	42
(I-1) + 3.22	200:1	50 + 0,25	53	33
(I-6) + 3.22	200:1	50 + 0,25	74	42
(I-1) + 10.10	1:4	50 + 200	53	18
(I-6) + 10.10	1:4	100 + 400	65	52
(I-1) + 5.30	1:4	50 + 200	59	33
(I-6) + 5.30	1:4	50 + 200	71	42

* found = activity found

** calc. = activity calculated using Colby's formula

Example

Venturia test (apples) / preventive

Solvent: 24.5 parts by weight of acetone

24.5 parts by weight of dimethylacetamide

Emulsifier: 1 part by weight of alkylaryl polyglycol ether

To produce a suitable preparation of active compound, 1 part by weight of active compound is mixed with the stated amounts of solvent and emulsifier, and the concentrate is diluted with water to the desired concentration.

To test for preventive activity, young plants are sprayed with the preparation of active compound at the stated rate of application. After the spray coating has dried on, the plants are inoculated with an aqueous conidia suspension of the causal agent of apple scab ***(Venturia inaequalis)*** and then remain for 1 day in an incubation cabinet at approximately 20 °C and a relative atmospheric humidity of 100%.

The plants are then placed in a greenhouse at approximately 21 °C and a relative atmospheric humidity of approximately 90%.

The test is evaluated 10 days after the inoculation. 0% means an efficacy which corresponds to that of the untreated control, while an efficacy of 100% means that no disease is observed.

Table 10

Venturia test (apples) / preventive

Active compounds		Application rate of active compound in ppm a.i.	Efficacy in %	
			found*	calc.**
(I-1)	2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone	100 25	8 0	
(I-6)	2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-chloro-6-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone	100 25	4 0	
2.1	bixafen	0,5	26	
2.2	boscalid	12,5	66	
2.6	fluopyram	4	33	
2.8	fluxapyroxad	0,5	54	
2.12	isopyrazam	0,5	76	
2.27	N-[1-(2,4-dichlorophenyl)-1-methoxypropan-2-yl]-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide	4	87	
(I-1) + 2.1	200:1	100 + 0,5	79	32
(I-1) + 2.2	2:1	25 + 12,5	84	66
(I-6) + 2.2	2:1	25 + 12,5	97	66
(I-1) + 2.6	25:1	100 + 4	85	38
(I-6) + 2.6	25:1	100 + 4	85	36
(I-1) + 2.8	200:1	100 + 0,5	89	58
(I-6) + 2.8	200:1	100 + 0,5	98	56
(I-1) + 2.12	200:1	100 + 0,5	99	78
(I-6) + 2.12	200:1	100 + 0,5	89	77
(I-1) + 2.27	25:1	100 + 4	99	88

* found = activity found
** calc. = activity calculated using Colby's formula

Table 11

Venturia test (apples) / preventive

Active compounds		Application rate of active compound in ppm a.i.	Efficacy in %	
			found*	calc.**
(I-1)	2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone	100 50	0 0	
(I-5)	2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-fluoro-6-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone	100 50	0 0	
(I-6)	2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-chloro-6-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone	100 50	38 13	
3.22	trifloxystrobin	0,25	0	
5.8	copper oxychloride	50	54	
5.16	folpet	10	43	
5.30	sulphur	200	39	
15.60	2,6-dimethyl-1H,5H-[1,4]dithiino[2,3-c:5,6-c']dipyrrole-1,3,5,7(2H,6H)-tetrone	25	54	
(I-1) + 3.22	200:1	50 + 0,25	82	0
(I-6) + 3.22	200:1	50 + 0,25	81	13
(I-5) + 5.8	2:1	100 + 50	64	54
(I-1) + 5.16	10:1	100 + 10	70	43
(I-5) + 5.16	10:1	100 + 10	78	43
(I-1) + 5.30	1:4	50 + 200	100	39
(I-6) + 5.30	1:4	50 + 200	100	47
(I-5) + 15.60	2:1	50 + 25	78	54

* found = activity found

** calc. = activity calculated using Colby's formula

Example

Botrytis test (beans) / preventive

Solvent:	24.5	parts by weight of acetone
	24.5	parts by weight of dimethylacetamide
Emulsifier:	1	part by weight of alkylaryl polyglycol ether

To produce a suitable preparation of active compound, 1 part by weight of active compound is mixed with the stated amounts of solvent and emulsifier, and the concentrate is diluted with water to the desired concentration.

To test for preventive activity, young plants are sprayed with the preparation of active compound. After the spray coating has dried on, 2 small pieces of agar covered with growth of ***Botrytis cinerea*** are placed on each leaf. The inoculated plants are placed in a darkened chamber at 20 °C and a relative atmospheric humidity of 100%.

2 days after the inoculation, the size of the lesions on the leaves is evaluated. 0% means an efficacy which corresponds to that of the untreated control, while an efficacy of 100% means that no disease is observed.

The test is evaluated 10 days after the inoculation. 0% means an efficacy which corresponds to that of the untreated control, while an efficacy of 100% means that no disease is observed.

Table 12

Botrytis test (beans) / preventive

Active compounds		Application rate of active compound in ppm a.i.	Efficacy in %	
			found*	calc.**
(I-1)	2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone	50 25	15 15	
(I-5)	2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-fluoro-6-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone	100 25	38 10	
5.4	chlorothalonil	5	8	
5.16	folpet	10	31	
5.23	mancozeb	5	0	
7.7	pyrimethanil	10	15	
(I-1) + 5.4	5:1	25 + 5	50	22
(I-5) + 5.4	5:1	25 + 5	80	17
(I-5) + 5.16	10:1	100 + 10	73	57
(I-1) + 5.23	10:1	50 + 5	55	15
(I-1) + 7.7	5:1	50 + 10	65	28

* found = activity found

** calc. = activity calculated using Colby's formula

Example

Sphaerotheca test (cucumbers) / preventive

Solvent:	24.5	parts by weight of acetone
	24.5	parts by weight of dimethylacetamide
Emulsifier:	1	part by weight of alkylaryl polyglycol ether

To produce a suitable preparation of active compound, 1 part by weight of active compound is mixed with the stated amounts of solvent and emulsifier, and the concentrate is diluted with water to the desired concentration.

To test for preventive activity, young plants are sprayed with the preparation of active compound at the stated rate of application. After the spray coating has dried on, the plants are inoculated with an aqueous spore suspension of ***Sphaerotheca fuliginea***. The plants are then placed in a greenhouse at approximately 23 °C and a relative atmospheric humidity of approximately 70%.

The test is evaluated 7 days after the inoculation. 0% means an efficacy which corresponds to that of the untreated control, while an efficacy of 100% means that no disease is observed.

The test is evaluated 10 days after the inoculation. 0% means an efficacy which corresponds to that of the untreated control, while an efficacy of 100% means that no disease is observed.

Table 13

Sphaerotheca test (cucumbers) / preventive

Active compounds		Application rate of active compound in ppm a.i.	Efficacy in %	
			found*	calc.**
(I-1)	2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone	50	0	
(I-6)	2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-chloro-6-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone	50	0	
2.2	boscalid	25	67	
(I-1) + 2.2	2:1	50 + 25	93	67
(I-6) + 2.2	2:1	50 + 25	83	67

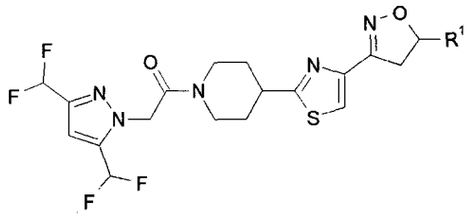
* found = activity found
** calc. = activity calculated using Colby's formula

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Patent Claims

1. Combinations comprising:

(A) at least one thiazolylisoxazoline of formula **(I)**



(I)

in which

R^1 represents phenyl, which is at least substituted with one prop-2-yn-1-yloxy and optionally be additionally substituted by one, two or three substituents selected from the group consisting of methyl, methoxy, fluoro or chloro or an agrochemically acceptable salt thereof,

and

(B) at least one further active compound selected from the following groups

inhibitors of the ergosterol synthesis,
inhibitors of the respiratory chain at complex I or II,
inhibitors of the respiratory chain at complex III,
inhibitors of the mitosis and cell division,
compounds capable of having a multisite action,
compounds capable of inducing a host defense,
inhibitors of the amino acid and/or protein biosynthesis,
inhibitors of the ATP production,
inhibitors of the cell wall synthesis,
inhibitors of the lipid and membrane synthesis,
inhibitors of the melanine biosynthesis,
inhibitors of the nucleic acid synthesis,
inhibitors of the signal transduction,
compounds capable of acting as uncoupler,
other fungicides.

2. Combinations according to claim 1 comprising at least one compound of the formula (I) selected from the group consisting of

(I-1) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-2) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[4-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-3) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[3-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-4) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2,6-difluoro-4-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-5) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-fluoro-6-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-6) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-chloro-6-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-7) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2,6-difluoro-3-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-8) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[5-fluoro-2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-9) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[4-methoxy-2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-10) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[3-fluoro-2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,.

3. Combinations according to claim 1 comprising at least one further active compound (B) selected from the following groups:

(2.1) bixafen, (2.2) boscalid, (2.6) fluopyram, (2.8) fluxapyroxad, (2.11) isopyrazam (mixture of syn-epimeric racemate 1RS,4SR,9RS and anti-epimeric racemate 1RS,4SR,9SR), (2.12) isopyrazam (anti-epimeric racemate 1RS,4SR,9SR), (2.13) isopyrazam (anti-epimeric enantiomer 1R,4S,9S), (2.14) isopyrazam (anti-epimeric enantiomer 1S,4R,9R), (2.15) isopyrazam (syn epimeric racemate 1RS,4SR,9RS), (2.16) isopyrazam (syn-epimeric enantiomer 1R,4S,9R), (2.17) isopyrazam (syn-epimeric enantiomer 1S,4R,9S), (2.27) N-[1-(2,4-dichlorophenyl)-1-methoxypropan-2-yl]-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide, (2.29) N-[9-(dichloromethylene)-1,2,3,4-tetrahydro-1,4-methanonaphthalen-5-yl]-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide, (3.1) ametoctradin, (3.2) amisulbrom, (3.3) azoxystrobin, (3.4) cyazofamid, (3.9) famoxadone, (3.10) fenamidone, (3.12) fluoxastrobin, (3.16) picoxystrobin,

(3.17) pyraclostrobin, (3.22) trifloxystrobin, (4.6) fluopicolide, (5.1) bordeaux mixture, (5.4) chlorothalonil, (5.5) copper hydroxide, (5.7) copper oxide, (5.8) copper oxychloride, (5.9) copper(2+) sulfate, (5.16) folpet, (5.23) mancozeb, (5.25) metiram, (5.26) metiram zinc, (5.29) propineb, (5.30) sulphur and sulphur preparations including calcium polysulphide, (7.7) pyrimethanil, (9.2) dimethomorph, (9.4) iprovalicarb, (9.5) mandipropamid, (10.9) propamocarb, (10.10) propamocarb hydrochloride, (12.9) metalaxyl, (12.10) metalaxyl-M (mefenoxam), (14.4) fluazinam, (15.9) cymoxanil, (15.24) fosetyl-aluminium, (15.25) fosetyl-calcium, (15.26) fosetyl-sodium, (15.41) phosphorous acid and its salts, (15.42) propamocarb-fosetylate, (15.54) 1-(4-{4-[(5R)-5-(2,6-difluorophenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)-2-[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]ethanone, (15.55) 1-(4-{4-[(5S)-5-(2,6-difluorophenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)-2-[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]ethanone, (15.56) 1-(4-{4-[5-(2,6-difluorophenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)-2-[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]ethanone, (15.60) 2,6-dimethyl-1H,5H-[1,4]dithiino[2,3-c:5,6-c']dipyrrole-1,3,5,7(2H,6H)-tetrone, (15.90) pentyl {6-[({[(1-methyl-1H-tetrazol-5-yl)(phenyl)methylidene]amino}oxy)methyl]pyridin-2-yl}carbamate.

4. Combination according to claims 1 to 3 comprising mixing partners (A):(B) in a weight ratio of 1:100 to 100:1.

5. Compositions comprising active compound combinations according to Claim 1, 2, 3 or 4 and further comprising auxiliaries, solvents, carriers, surfactant or extenders.

6. Method for controlling phytopathogenic fungi in crop protection, characterized in that active compound combinations according to Claim 1, 2, 3 or 4 or compositions according to Claim 5 are applied to the seed, the plant, to fruits of plants or to the soil on which the plant grows or is supposed to grow.

7. Method according to Claim 06, characterized in that the plant, the fruits of plants or the soil on which the plant grows or is intended to grow are treated.

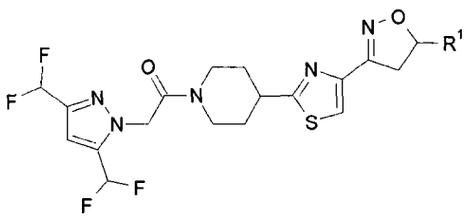
8. Method according to Claim 06, characterized in that in the treatment of leaves from 0.1 to 10 000 g/ha and in the treatment of seed from 2 to 200 g per 100 kg of seed are employed.

9. Use of active compound combinations according to Claim 1, 2, 3 or 4 or of compositions according to Claim 5 for controlling unwanted phytopathogenic fungi in crop protection.

10. Use of active compound combinations according to Claim or of compositions according to Claim 5 for treating seed, seed of transgenic plants and transgenic plants.

11. Seed treated with active compound combinations according to Claim 1, 2, 3 or 4 or with compositions according to Claim 5.

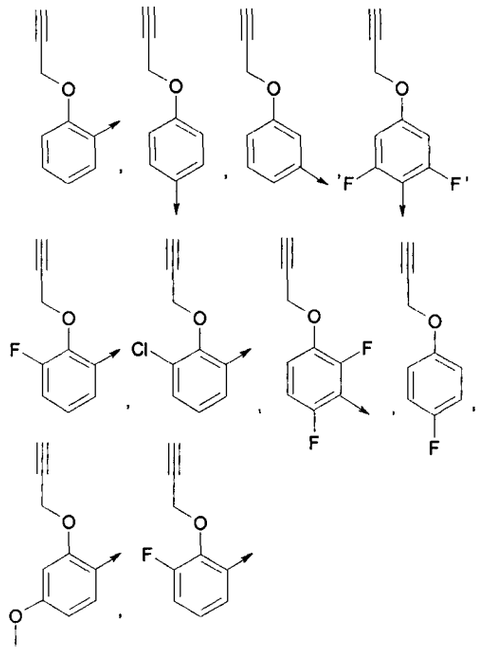
12. Thiazolylisoxazoline of formula **(I)**



(I)

in which

R^1 is



INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2012/060508

A. CLASSIFICATION OF SUBJECT MATTER
INV. A01N43/78 A01N43/80 A01P3/00 C07D417/14 A01N25/00
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A01N C07D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, CHEM ABS Data, BEILSTEIN Data, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2008/013622 A2 (DU PONT [US]; PASTERIS ROBERT JAMES [US]; HANAGAN MARY ANN [US]; SHAPI) 31 January 2008 (2008-01-31) page 98 - page 101; table 1A page 240, line 31 - page 243, line 8; claims; examples ----	1-12
X	WO 2008/091594 A2 (DU PONT [US]; BRUHN JOHN ANTHONY [US]; PASTERIS ROBERT JAMES [US]) 31 July 2008 (2008-07-31) page 13, line 35 - page 22, line 7; claims; examples; table 4 ---- -/--	1-12

[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
21 June 2012	03/07/2012

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Butkowskyj-Walkiw, T

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2012/060508

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X,P	WO 2011/076699 A1 (BAYER CROPSCIENCE AG [DE]; CRISTAU PIERRE [FR]; HOFFMANN SEBASTIAN [DE) 30 June 2011 (2011-06-30) cited in the application page 47, line 21 - page 48, line 15; table 1; compounds I-21, I-22, I-39	1,2,5-12
A	US 2011/105429 A1 (CRISTAU PIERRE [DE] ET AL) 5 May 2011 (2011-05-05) paragraphs [0295], [0356] - [0361]; claims; examples	1-12
A	WO 2011/051244 A1 (BAYER CROPSCIENCE AG [DE]; CRISTAU PIERRE [FR]; RAHN NICOLA [DE]; TSUC) 5 May 2011 (2011-05-05) page 77, line 11 - line 15; claims; examples page 81, line 17 - line 22 page 100, line 1 - line 6	1-12

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/EP2012/060508

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2008013622 A2	31-01-2008	AR 063213 A1	14-01-2009
		AU 2007277157 A1	31-01-2008
		CA 2653640 A1	31-01-2008
		CL 21852007 A1	13-06-2008
		CN 101888843 A	17-11-2010
		CO 6150154 A2	20-04-2010
		EP 2049111 A2	22-04-2009
		GE P20125505 B	25-04-2012
		JP 2010509190 A	25-03-2010
		KR 20090033496 A	03-04-2009
		ME 00586 A	20-12-2011
		PE 09522008 A1	10-09-2008
		RU 2009106871 A	10-09-2010
		TW 200822865 A	01-06-2008
		US 2009156592 A1	18-06-2009
		UY 30510 A1	29-02-2008
		WO 2008013622 A2	31-01-2008
WO 2008091594 A2	31-07-2008	NONE	
WO 2011076699 A1	30-06-2011	US 2011224257 A1	15-09-2011
		WO 2011076699 A1	30-06-2011
US 2011105429 A1	05-05-2011	AU 2009243401 A1	05-11-2009
		CA 2722775 A1	05-11-2009
		CO 6311101 A2	22-08-2011
		EA 201001699 A1	29-04-2011
		EP 2280965 A1	09-02-2011
		JP 2011523938 A	25-08-2011
		KR 20100135952 A	27-12-2010
		US 2011105429 A1	05-05-2011
		WO 2009132785 A1	05-11-2009
WO 2011051244 A1	05-05-2011	TW 201127287 A	16-08-2011
		US 2011306620 A1	15-12-2011
		WO 2011051244 A1	05-05-2011

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DOCUMENT MADE AVAILABLE UNDER THE PATENT COOPERATION TREATY (PCT)

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International filing date:		**04 June 2012 (04.06.2012)**
Document type:		**Certified copy of priority document**
Document details:	Country/Office:	**EP**
	Number:	**11168904.8**
	Filing date:	**07 June 2011 (07.06.2011)**
Date of receipt at the International Bureau:		**09 July 2012 (09.07.2012)**

Remark: Priority document submitted or transmitted to the International Bureau in compliance with Rule 17.1(a),(b) or (b-*bis*)

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Bescheinigung	Certificate	Attestation
Die angehefteten Unterlagen stimmen mit der als ursprünglich eingereicht geltenden Fassung der auf dem nächsten Blatt bezeichneten europäischen Patentanmeldung überein.	The attached documents are exact copies of the text in which the European patent application described on the following page is deemed to have been filed.	Les documents joints à la présente attestation sont conformes au texte, considéré comme initialement déposé, de la demande de brevet européen qui est spécifiée à la page suivante.

Patentanmeldung Nr.	**Patent application No.**	**Demande de brevet n°**

11168904.8 / EP11168904

The organization code and number of your priority application, to be used for filing abroad under the Paris Convention, is EP11168904.

Der Präsident des Europäischen Patentamts;
Im Auftrag

For the President of the European Patent Office

Le President de l'Office européen des brevets
p.o.

R.C. van Dijk

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Anmeldung Nr:
Application no.: 11168904.8
Demande no :

Anmeldetag:
Date of filing: 07.06.11
Date de dépôt :

Anmelder / Applicant(s) / Demandeur(s):

Bayer CropScience AG
BCS-BPA-LP-PL
Gebäude 6100
Alfred-Nobel-Straße 50
40789 Monheim/DE

Bezeichnung der Erfindung / Title of the invention / Titre de l'invention:
(Falls die Bezeichnung der Erfindung nicht angegeben ist, siehe Beschreibung.
If no title is shown please refer to the description.
Si aucun titre n'est indiqué se référer à la description.)

Active compound combinations

In Anspruch genommene Priorität(en) / Priority(Priorities) claimed / Priorité(s) revendiquée(s)
Staat/Tag/Aktenzeichen / State/Date/File no. / Pays/Date/Numéro de dépôt:

Internationale Patentklassifikation / International Patent Classification / Classification internationale de brevets:

A01N

Am Anmeldetag benannte Vertragstaaten / Contracting States designated at date of filing / Etats contractants désignées lors du dépôt:

AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

Active compound combinations

The present invention relates to active compound combinations, in particular within a fungicide composition, which comprises (A) a thiazolylisoxazoline of formula (I) and a further fungicidally active compound (B). Moreover, the invention relates to a method for curatively or preventively controlling the phytopathogenic fungi of plants or crops, to the use of a combination according to the invention for the treatment of seed, to a method for protecting a seed and not at least to the treated seed.

It is already known that certain thiazolylisoxazolines can be used as fungicides (see WO08/013925, WO WO09/094407, WO09/094445, WO09/055514 and PCT/EP2010/070156).

Since the environmental and economic requirements imposed on modern-day crop protection compositions are continually increasing, with regard, for example, to the spectrum of action, toxicity, selectivity, application rate, formation of residues, and favourable preparation ability, and since, furthermore, there may be problems, for example, with resistances, a constant task is to develop new compositions, in particular fungicidal agents, which in some areas at least help to fulfil the abovementioned requirements.

The present invention provides active compound combinations/compositions which in some aspects at least achieve the stated objective.

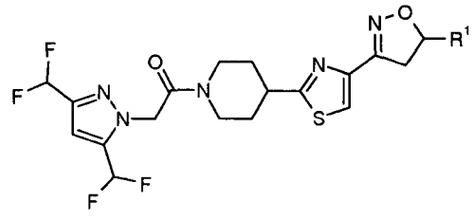
It has now been found, surprisingly, that the combinations according to the invention not only bring about the additive enhancement of the spectrum of action with respect to the phytopathogen to be controlled that was in principle to be expected but achieves a synergistic effect which extends the range of action of the component (A) and of the component (B) in two ways. Firstly, the rates of application of the component (A) and of the component (B) are lowered whilst the action remains equally good. Secondly, the combination still achieves a high degree of phytopathogen control even where the two individual compounds have become totally ineffective in such a low application rate range. This allows, on the one hand, a substantial broadening of the spectrum of phytopathogens that can be controlled and, on the other hand, increased safety in use.

In addition to the fungicidal synergistic activity, the active compound combinations according to the invention have further surprising properties which, in a wider sense, may also be called synergistic, such as, for example: broadening of the activity spectrum to other phytopathogens, for example to resistant strains of plant diseases; lower application rates of the active compounds; sufficient control of pests with the aid of the active compound combinations according to the invention even at application rates where the individual compounds show no or virtually no activity; advantageous behaviour during formulation or during use, for example during grinding, sieving, emulsifying, dissolving or dispensing; improved storage stability and light stability; advantageous residue formation; improved toxicological or ecotoxicological behaviour; improved properties of the plant, for example better growth, increased harvest yields, a better developed root system, a larger leaf area, greener leaves, stronger shoots, less seed required, lower phytotoxicity, mobilization of the defence sys-

tem of the plant, good compatibility with plants. Thus, the use of the active compound combinations or compositions according to the invention contributes considerably to keeping young cereal stands healthy, which increases, for example, the winter survival of the cereal seed treated, and also safeguards quality and yield. Moreover, the active compound combinations according to the invention may contribute to enhanced systemic action. Even if the individual compounds of the combination have no sufficient systemic properties, the active compound combinations according to the invention may still have this property. In a similar manner, the active compound combinations according to the invention may result in higher persistency of the fungicidal action.

Accordingly, the present invention provides a combination comprising:

(A) at least one thiazolylisoxazoline of formula (**I**)



(I)

in which

R^1 represents phenyl, which is at least substituted with one prop-2-yn-1-yloxy and optionally be additionally substituted by one, two or three substituents selected from the groups consisting of methyl, methoxy, fluoro or chloro

or an agrochemically acceptable salt thereof,

and

(B) at least one further active compound selected from the following groups

(1) inhibitors of the ergosterol synthesis,

(2) inhibitors of the respiratory chain at complex I or II,

(3) inhibitors of the respiratory chain at complex III,

(4) inhibitors of the mitosis and cell division,

(5) compounds capable of having a multisite action,

(6) compounds capable of inducing a host defense,

(7) inhibitors of the amino acid and/or protein biosynthesis,

(8) inhibitors of the ATP production,

(9) inhibitors of the cell wall synthesis,

(10) inhibitors of the lipid and membrane synthesis,

(11) inhibitors of the melanine biosynthesis,

(12) inhibitors of the nucleic acid synthesis,

(13) inhibitors of the signal transduction,

(14) compounds capable of acting as uncoupler,

(15) other fungicides.

Preference is given to combinations comprising at least one compound of the formula (I) selected from the group consisting of

(I-1) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-2) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[4-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-3) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[3-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-4) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2,6-difluoro-4-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-5) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-fluoro-6-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-6) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-chloro-6-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

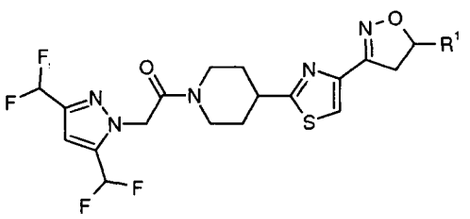
(I-7) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2,6-difluoro-3-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-8) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[5-fluoro-2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-9) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[4-methoxy-2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-10) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[3-fluoro-2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone.

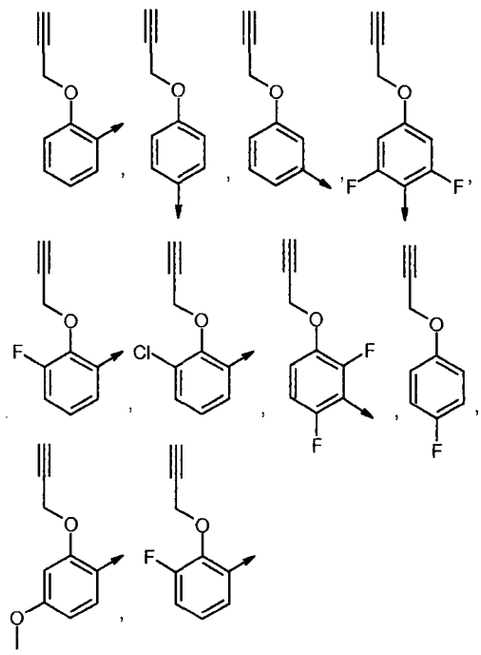
The present invention is also directed to thiazolylisoxazoline of formula **(I)**



(I)

in which

R^1 is



Thiazolylisoxazoline of formula (I) according to the present invention are:

(I-1) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-2) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[4-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-3) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[3-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-4) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2,6-difluoro-4-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-5) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-fluoro-6-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-6) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-chloro-6-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-7) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2,6-difluoro-3-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-8) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[5-fluoro-2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-9) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[4-methoxy-2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-10) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[3-fluoro-2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone.

In the description below numbers in parenthesis behind a compound name represent the CAS Registry No. of said compound.

Preference is further given to combinations comprising at least one further active compound (B) selected from the following groups:

(1) Inhibitors of the ergosterol biosynthesis, for example (1.1) aldimorph (1704-28-5), (1.2) azaconazole (60207-31-0), (1.3) bitertanol (55179-31-2), (1.4) bromuconazole (116255-48-2), (1.5) cyproconazole (113096-99-4), (1.6) diclobutrazole (75736-33-3), (1.7) difenoconazole (119446-68-3), (1.8) diniconazole (83657-24-3), (1.9) diniconazole-M (83657-18-5), (1.10) dodemorph (1593-77-7), (1.11) dodemorph acetate (31717-87-0), (1.12) epoxiconazole (106325-08-0), (1.13) etaconazole (60207-93-4), (1.14) fenarimol (60168-88-9), (1.15) fenbuconazole (114369-43-6), (1.16) fenhexamid (126833-17-8), (1.17) fenpropidin (67306-00-7), (1.18) fenpropimorph (67306-03-0), (1.19) fluquinconazole (136426-54-5), (1.20) flurprimidol (56425-91-3), (1.21) flusilazole (85509-19-9), (1.22) flutriafol (76674-21-0), (1.23) furconazole (112839-33-5), (1.24) furconazole-cis (112839-32-4), (1.25) hexaconazole (79983-71-4), (1.26) imazalil (60534-80-7), (1.27) imazalil sulfate (58594-72-2), (1.28) imibenconazole (86598-92-7), (1.29) ipconazole (125225-28-7), (1.30) metconazole (125116-23-6), (1.31) myclobutanil (88671-89-0), (1.32) naftifine (65472-88-0), (1.33) nuarimol (63284-71-9), (1.34) oxpoconazole (174212-12-5), (1.35) paclobutrazol (76738-62-0), (1.36) pefurazoate (101903-30-4), (1.37) penconazole (66246-88-6), (1.38) piperalin (3478-94-2), (1.39) prochloraz (67747-09-5), (1.40) propiconazole (60207-90-1), (1.41) prothioconazole (178928-70-6), (1.42) pyributicarb (88678-67-5), (1.43) pyrifenox (88283-41-4), (1.44) quinconazole (103970-75-8), (1.45) simeconazole (149508-90-7), (1.46) spiroxamine (118134-30-8), (1.47) tebuconazole (107534-96-3), (1.48) terbinafine (91161-71-6), (1.49) tetraconazole (112281-77-3), (1.50) triadimefon (43121-43-3), (1.51) triadimenol (89482-17-7), (1.52) tridemorph (81412-43-3), (1.53) triflumizole (68694-11-1), (1.54) triforine (26644-46-2), (1.55) triticonazole (131983-72-7), (1.56) uniconazole (83657-22-1), (1.57) uniconazole-p (83657-17-4), (1.58) viniconazole (77174-66-4), (1.59) voriconazole (137234-62-9), (1.60) 1-(4-chlorophenyl)-2-(1H-1,2,4-triazol-1-yl)cycloheptanol (129586-32-9), (1.61) methyl 1-(2,2-dimethyl-2,3-dihydro-1H-inden-1-yl)-1H-imidazole-5-carboxylate (110323-95-0), (1.62) N'-{5-(difluoromethyl)-2-methyl-4-[3-(trimethylsilyl)propoxy]phenyl}-N-ethyl-N-methylimidoformamide, (1.63) N-ethyl-N-methyl-N'-{2-methyl-5-(trifluoromethyl)-4-[3-(trimethylsilyl)propoxy]phenyl}imidoformamide

and (1.64) O-[1-(4-methoxyphenoxy)-3,3-dimethylbutan-2-yl] 1H-imidazole-1-carbothioate (111226-71-2).

(2) inhibitors of the respiratory chain at complex I or II, for example (2.1) bixafen (581809-46-3), (2.2) boscalid (188425-85-6), (2.3) carboxin (5234-68-4), (2.4) diflumetorim (130339-07-0), (2.5) fenfuram (24691-80-3), (2.6) fluopyram (658066-35-4), (2.7) flutolanil (66332-96-5), (2.8) fluxapyroxad (907204-31-3), (2.9) furametpyr (123572-88-3), (2.10) furmecyclox (60568-05-0), (2.11) isopyrazam (mixture of syn-epimeric racemate 1RS,4SR,9RS and anti-epimeric racemate 1RS,4SR,9SR) (881685-58-1), (2.12) isopyrazam (anti-epimeric racemate 1RS,4SR,9SR), (2.13) isopyrazam (anti-epimeric enantiomer 1R,4S,9S), (2.14) isopyrazam (anti-epimeric enantiomer 1S,4R,9R), (2.15) isopyrazam (syn epimeric racemate 1RS,4SR,9RS), (2.16) isopyrazam (syn-epimeric enantiomer 1R,4S,9R), (2.17) isopyrazam (syn-epimeric enantiomer 1S,4R,9S), (2.18) mepronil (55814-41-0), (2.19) oxycarboxin (5259-88-1), (2.20) penflufen (494793-67-8), (2.21) penthiopyrad (183675-82-3), (2.22) sedaxane (874967-67-6), (2.23) thifluzamide (130000-40-7), (2.24) 1-methyl-N-[2-(1,1,2,2-tetrafluoroethoxy)phenyl]-3-(trifluoromethyl)-1H-pyrazole-4-carboxamide, (2.25) 3-(difluoromethyl)-1-methyl-N-[2-(1,1,2,2-tetrafluoroethoxy)phenyl]-1H-pyrazole-4-carboxamide, (2.26) 3-(difluoromethyl)-N-[4-fluoro-2-(1,1,2,3,3,3-hexafluoropropoxy)phenyl]-1-methyl-1H-pyrazole-4-carboxamide, (2.27) N-[1-(2,4-dichlorophenyl)-1-methoxypropan-2-yl]-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide (1092400-95-7) (WO 2008148570), (2.28) 5,8-difluoro-N-[2-(2-fluoro-4-{[4-(trifluoromethyl)pyridin-2-yl]oxy}phenyl)ethyl]quinazolin-4-amine (1210070-84-0) (WO2010025451) (2.29) N-[9-(dichloromethylene)-1,2,3,4-tetrahydro-1,4-methanonaphthalen-5-yl]-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide, (2.30) N-[(1S,4R)-9-(dichloromethylene)-1,2,3,4-tetrahydro-1,4-methanonaphthalen-5-yl]-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide and (2.31) N-[(1R,4S)-9-(dichloromethylene)-1,2,3,4-tetrahydro-1,4-methanonaphthalen-5-yl]-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide.

(3) inhibitors of the respiratory chain at complex III, for example (3.1) ametoctradin (865318-97-4), (3.2) amisulbrom (348635-87-0), (3.3) azoxystrobin (131860-33-8), (3.4) cyazofamid (120116-88-3), (3.5) coumethoxystrobin (850881-30-0), (3.6) coumoxystrobin (850881-70-8), (3.7) dimoxystrobin (141600-52-4), (3.8) enestroburin (238410-11-2) (WO 2004/058723), (3.9) famoxadone (131807-57-3) (WO 2004/058723), (3.10) fenamidone (161326-34-7) (WO 2004/058723), (3.11) fenoxystrobin (918162-02-4), (3.12) fluoxastrobin (361377-29-9) (WO 2004/058723), (3.13) kresoxim-methyl (143390-89-0) (WO 2004/058723), (3.14) metominostrobin (133408-50-1) (WO 2004/058723), (3.15) orysastrobin (189892-69-1) (WO 2004/058723), (3.16) picoxystrobin (117428-22-5) (WO 2004/058723), (3.17) pyraclostrobin (175013-18-0) (WO 2004/058723), (3.18) pyrametostrobin (915410-70-7) (WO 2004/058723), (3.19) pyraoxystrobin (862588-11-2) (WO 2004/058723), (3.20) pyribencarb (799247-52-2) (WO 2004/058723), (3.21) triclopyricarb (902760-40-1), (3.22) trifloxystrobin (141517-21-7) (WO 2004/058723), (3.23) (2E)-2-(2-{[6-(3-chloro-2-methylphenoxy)-5-fluoropyrimidin-4-yl]oxy}phenyl)-2-(methoxyimino)-N-methylethanamide (WO 2004/058723), (3.24) (2E)-2-(methoxyimino)-N-methyl-2-(2-{[({(1E)-1-[3-

(trifluoromethyl)phenyl]ethylidene}amino)oxy]methyl}phenyl)ethanamide (WO 2004/058723), (3.25) (2E)-2-(methoxyimino)-N-methyl-2-{2-[(E)-({1-[3-(trifluoromethyl)phenyl]ethoxy}imino)methyl]phenyl}ethanamide (158169-73-4), (3.26) (2E)-2-{2-[({[(1E)-1-(3-{[(E)-1-fluoro-2-phenylethenyl]oxy}phenyl)ethylidene]amino}oxy)methyl]phenyl}-2-(methoxyimino)-N-methylethanamide (326896-28-0), (3.27) (2E)-2-{2-[({[(2E,3E)-4-(2,6-dichlorophenyl)but-3-en-2-ylidene]amino}oxy)methyl]phenyl}-2-(methoxyimino)-N-methylethanamide, (3.28) 2-chloro-N-(1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl)pyridine-3-carboxamide (119899-14-8), (3.29) 5-methoxy-2-methyl-4-(2-{[({(1E)-1-[3-(trifluoromethyl)phenyl]ethylidene}amino)oxy]-methyl}phenyl)-2,4-dihydro-3H-1,2,4-triazol-3-one, (3.30) methyl (2E)-2-{2-[({cyclopropyl[(4-methoxyphenyl)imino]methyl}sulfanyl)methyl]phenyl}-3-methoxyprop-2-enoate (149601-03-6), (3.31) N-(3-ethyl-3,5,5-trimethylcyclohexyl)-3-(formylamino)-2-hydroxybenzamide (226551-21-9), (3.32) 2-{2-[(2,5-dimethylphenoxy)methyl]phenyl}-2-methoxy-N-methylacetamide (173662-97-0) and (3.33) (2R)-2-{2-[(2,5-dimethylphenoxy)methyl]phenyl}-2-methoxy-N-methylacetamide (394657-24-0).

(4) Inhibitors of the mitosis and cell division, for example (4.1) benomyl (17804-35-2), (4.2) carbendazim (10605-21-7), (4.3) chlorfenazole (3574-96-7), (4.4) diethofencarb (87130-20-9), (4.5) ethaboxam (162650-77-3), (4.6) fluopicolide (239110-15-7), (4.7) fuberidazole (3878-19-1), (4.8) pencycuron (66063-05-6), (4.9) thiabendazole (148-79-8), (4.10) thiophanate-methyl (23564-05-8), (4.11) thiophanate (23564-06-9), (4.12) zoxamide (156052-68-5), (4.13) 5-chloro-7-(4-methylpiperidin-1-yl)-6-(2,4,6-trifluorophenyl)[1,2,4]triazolo[1,5-a]pyrimidine (214706-53-3) and (4.14) 3-chloro-5-(6-chloropyridin-3-yl)-6-methyl-4-(2,4,6-trifluorophenyl)pyridazine (1002756-87-7).

(5) Compounds capable to have a multisite action, like for example (5.1) bordeaux mixture (8011-63-0), (5.2) captafol (2425-06-1), (5.3) captan (133-06-2) (WO 02/12172), (5.4) chlorothalonil (1897-45-6), (5.5) copper hydroxide (20427-59-2), (5.6) copper naphthenate (1338-02-9), (5.7) copper oxide (1317-39-1), (5.8) copper oxychloride (1332-40-7), (5.9) copper(2+) sulfate (7758-98-7), (5.10) dichlofluanid (1085-98-9), (5.11) dithianon (3347-22-6), (5.12) dodine (2439-10-3), (5.13) dodine free base, (5.14) ferbam (14484-64-1), (5.15) fluorofolpet (719-96-0), (5.16) folpet (133-07-3), (5.17) guazatine (108173-90-6), (5.18) guazatine acetate, (5.19) iminoctadine (13516-27-3), (5.20) iminoctadine albesilate (169202-06-6), (5.21) iminoctadine triacetate (57520-17-9), (5.22) mancopper (53988-93-5), (5.23) mancozeb (8018-01-7), (5.24) maneb (12427-38-2), (5.25) metiram (9006-42-2), (5.26) metiram zinc (9006-42-2), (5.27) oxine-copper (10380-28-6), (5.28) propamidine (104-32-5), (5.29) propineb (12071-83-9), (5.30) sulphur and sulphur preparations including calcium polysulphide (7704-34-9), (5.31) thiram (137-26-8), (5.32) tolylfluanid (731-27-1), (5.33) zineb (12122-67-7) and (5.34) ziram (137-30-4).

(6) Compounds capable to induce a host defence, like for example (6.1) acibenzolar-S-methyl (135158-54-2), (6.2) isotianil (224049-04-1), (6.3) probenazole (27605-76-1) and (6.4) tiadinil (223580-51-6).

(7) Inhibitors of the amino acid and/or protein biosynthesis, for example (7.1) andoprim (23951-85-1), (7.2) blasticidin-S (2079-00-7), (7.3) cyprodinil (121552-61-2), (7.4) kasugamycin (6980-18-3), (7.5) kasugamycin hydrochloride hydrate (19408-46-9), (7.6) mepanipyrim (110235-47-7), (7.7) pyrimethanil (53112-28-0) and (7.8) 3-(5-fluoro-3,3,4,4-tetramethyl-3,4-dihydroisoquinolin-1-yl)quinoline (861647-32-7) (WO2005070917).

(8) Inhibitors of the ATP production, for example (8.1) fentin acetate (900-95-8), (8.2) fentin chloride (639-58-7), (8.3) fentin hydroxide (76-87-9) and (8.4) silthiofam (175217-20-6).

(9) Inhibitors of the cell wall synthesis, for example (9.1) benthiavalicarb (177406-68-7), (9.2) dimethomorph (110488-70-5), (9.3) flumorph (211867-47-9), (9.4) iprovalicarb (140923-17-7), (9.5) mandipropamid (374726-62-2), (9.6) polyoxins (11113-80-7), (9.7) polyoxorim (22976-86-9), (9.8) validamycin A (37248-47-8) and (9.9) valifenalate (283159-94-4; 283159-90-0).

(10) Inhibitors of the lipid and membrane synthesis, for example (10.1) biphenyl (92-52-4), (10.2) chloroneb (2675-77-6), (10.3) dicloran (99-30-9), (10.4) edifenphos (17109-49-8), (10.5) etridiazole (2593-15-9), (10.6) iodocarb (55406-53-6), (10.7) iprobenfos (26087-47-8), (10.8) isoprothiolane (50512-35-1), (10.9) propamocarb (25606-41-1), (10.10) propamocarb hydrochloride (25606-41-1), (10.11) prothiocarb (19622-08-3), (10.12) pyrazophos (13457-18-6), (10.13) quintozene (82-68-8), (10.14) tecnazene (117-18-0) and (10.15) tolclofos-methyl (57018-04-9).

(11) Inhibitors of the melanine biosynthesis, for example (11.1) carpropamid (104030-54-8), (11.2) diclocymet (139920-32-4), (11.3) fenoxanil (115852-48-7), (11.4) phthalide (27355-22-2), (11.5) pyroquilon (57369-32-1), (11.6) tricyclazole (41814-78-2) and (11.7) 2,2,2-trifluoroethyl {3-methyl-1-[(4-methylbenzoyl)amino]butan-2-yl}carbamate (851524-22-6) (WO2005042474).

(12) Inhibitors of the nucleic acid synthesis, for example (12.1) benalaxyl (71626-11-4), (12.2) benalaxyl-M (kiralaxyl) (98243-83-5), (12.3) bupirimate (41483-43-6), (12.4) clozylacon (67932-85-8), (12.5) dimethirimol (5221-53-4), (12.6) ethirimol (23947-60-6), (12.7) furalaxyl (57646-30-7), (12.8) hymexazol (10004-44-1), (12.9) metalaxyl (57837-19-1), (12.10) metalaxyl-M (mefenoxam) (70630-17-0), (12.11) ofurace (58810-48-3), (12.12) oxadixyl (77732-09-3) and (12.13) oxolinic acid (14698-29-4).

(13) Inhibitors of the signal transduction, for example (13.1) chlozolinate (84332-86-5), (13.2) fenpiclonil (74738-17-3), (13.3) fludioxonil (131341-86-1), (13.4) iprodione (36734-19-7), (13.5) procymidone (32809-16-8), (13.6) quinoxyfen (124495-18-7) and (13.7) vinclozolin (50471-44-8).

(14) Compounds capable to act as an uncoupler, like for example (14.1) binapacryl (485-31-4), (14.2) dinocap (131-72-6), (14.3) ferimzone (89269-64-7), (14.4) fluazinam (79622-59-6) and (14.5) meptyldinocap (131-72-6).

(15) Further compounds, like for example (15.1) benthiazole (21564-17-0), (15.2) bethoxazin (163269-30-5), (15.3) capsimycin (70694-08-5), (15.4) carvone (99-49-0), (15.5) chinomethionat (2439-01-2), (15.6) pyriofenone (chlazafenone) (688046-61-9), (15.7) cufraneb (11096-18-7), (15.8) cyflufenamid (180409-60-3), (15.9) cymoxanil (57966-95-7), (15.10) cyprosulfamide (221667-31-8), (15.11) dazomet (533-74-4), (15.12) debacarb (62732-91-6), (15.13) dichlorophen (97-23-4), (15.14) diclomezine (62865-36-5), (15.15) difenzoquat (49866-87-7), (15.16) difenzoquat methylsulphate (43222-48-6), (15.17) diphenylamine (122-39-4), (15.18) ecomate, (15.19) fenpyrazamine (473798-59-3), (15.20) flumetover (154025-04-4), (15.21) fluoroimide (41205-21-4), (15.22) flusulfamide (106917-52-6), (15.23) flutianil (304900-25-2), (15.24) fosetyl-aluminium (39148-24-8), (15.25) fosetyl-calcium, (15.26) fosetyl-sodium (39148-16-8), (15.27) hexachlorobenzene (118-74-1), (15.28) irumamycin (81604-73-1), (15.29) methasulfocarb (66952-49-6), (15.30) methyl isothiocyanate (556-61-6), (15.31) metrafenone (220899-03-6), (15.32) mildiomycin (67527-71-3), (15.33) natamycin (7681-93-8), (15.34) nickel dimethyldithiocarbamate (15521-65-0), (15.35) nitrothal-isopropyl (10552-74-6), (15.36) octhilinone (26530-20-1), (15.37) oxamocarb (917242-12-7), (15.38) oxyfenthiin (34407-87-9), (15.39) pentachlorophenol and salts (87-86-5), (15.40) phenothrin, (15.41) phosphorous acid and its salts (13598-36-2), (15.42) propamocarb-fosetylate, (15.43) propanosine-sodium (88498-02-6), (15.44) proquinazid (189278-12-4), (15.45) pyrimorph (868390-90-3), (15.45e) (2E)-3-(4-tert-butylphenyl)-3-(2-chloropyridin-4-yl)-1-(morpholin-4-yl)prop-2-en-1-one (1231776-28-5), (15.45z) (2Z)-3-(4-tert-butylphenyl)-3-(2-chloropyridin-4-yl)-1-(morpholin-4-yl)prop-2-en-1-one (1231776-29-6), (15.46) pyrrolnitrine (1018-71-9) (EP-A 1 559 320), (15.47) tebufloquin (376645-78-2), (15.48) tecloftalam (76280-91-6), (15.49) tolnifanide (304911-98-6), (15.50) triazoxide (72459-58-6), (15.51) trichlamide (70193-21-4), (15.52) zarilamid (84527-51-5), (15.53) (3S,6S,7R,8R)-8-benzyl-3-[({3-[(isobutyryloxy)methoxy]-4-methoxypyridin-2-yl}carbonyl)amino]-6-methyl-4,9-dioxo-1,5-dioxonan-7-yl 2-methylpropanoate (517875-34-2) (WO2003035617), (15.54) 1-(4-{4-[(5R)-5-(2,6-difluorophenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)-2-[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]ethanone (1003319-79-6) (WO 2008013622), (15.55) 1-(4-{4-[(5S)-5-(2,6-difluorophenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)-2-[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]ethanone (1003319-80-9) (WO 2008013622), (15.56) 1-(4-{4-[5-(2,6-difluorophenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)-2-[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]ethanone (1003318-67-9) (WO 2008013622), (15.57) 1-(4-methoxyphenoxy)-3,3-dimethylbutan-2-yl 1H-imidazole-1-carboxylate (111227-17-9), (15.58) 2,3,5,6-tetrachloro-4-(methylsulfonyl)pyridine (13108-52-6), (15.59) 2,3-dibutyl-6-chlorothieno[2,3-d]pyrimidin-4(3H)-one (221451-58-7), (15.60) 2,6-dimethyl-1H,5H-[1,4]dithiino[2,3-c:5,6-c']dipyrrole-1,3,5,7(2H,6H)-tetrone, (15.61) 2-[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]-1-(4-{4-[(5R)-5-phenyl-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)ethanone (1003316-53-7) (WO 2008013622), (15.62) 2-[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]-1-(4-{4-[(5S)-5-phenyl-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)ethanone (1003316-54-8) (WO 2008013622), (15.63) 2-[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]-1-{4-[4-(5-phenyl-4,5-dihydro-1,2-oxazol-3-yl)-1,3-thiazol-2-

yl]piperidin-1-yl}ethanone (1003316-51-5) (WO 2008013622), (15.64) 2-butoxy-6-iodo-3-propyl-4H-chromen-4-one, (15.65) 2-chloro-5-[2-chloro-1-(2,6-difluoro-4-methoxyphenyl)-4-methyl-1H-imidazol-5-yl]pyridine, (15.66) 2-phenylphenol and salts (90-43-7), (15.67) 3-(4,4,5-trifluoro-3,3-dimethyl-3,4-dihydroisoquinolin-1-yl)quinoline (861647-85-0) (WO2005070917), (15.68) 3,4,5-trichloropyridine-2,6-dicarbonitrile (17824-85-0), (15.69) 3-[5-(4-chlorophenyl)-2,3-dimethyl-1,2-oxazolidin-3-yl]pyridine, (15.70) 3-chloro-5-(4-chlorophenyl)-4-(2,6-difluorophenyl)-6-methylpyridazine, (15.71) 4-(4-chlorophenyl)-5-(2,6-difluorophenyl)-3,6-dimethylpyridazine, (15.72) 5-amino-1,3,4-thiadiazole-2-thiol, (15.73) 5-chloro-N'-phenyl-N'-(prop-2-yn-1-yl)thiophene-2-sulfonohydrazide (134-31-6), (15.74) 5-fluoro-2-[(4-fluorobenzyl)oxy]pyrimidin-4-amine (1174376-11-4) (WO2009094442), (15.75) 5-fluoro-2-[(4-methylbenzyl)oxy]pyrimidin-4-amine (1174376-25-0) (WO2009094442), (15.76) 5-methyl-6-octyl[1,2,4]triazolo[1,5-a]pyrimidin-7-amine, (15.77) ethyl (2Z)-3-amino-2-cyano-3-phenylprop-2-enoate, (15.78) N'-(4-{[3-(4-chlorobenzyl)-1,2,4-thiadiazol-5-yl]oxy}-2,5-dimethylphenyl)-N-ethyl-N-methylimidoformamide, (15.79) N-(4-chlorobenzyl)-3-[3-methoxy-4-(prop-2-yn-1-yloxy)phenyl]propanamide, (15.80) N-[(4-chlorophenyl)(cyano)methyl]-3-[3-methoxy-4-(prop-2-yn-1-yloxy)phenyl]propanamide, (15.81) N-[(5-bromo-3-chloropyridin-2-yl)methyl]-2,4-dichloropyridine-3-carboxamide, (15.82) N-[1-(5-bromo-3-chloropyridin-2-yl)ethyl]-2,4-dichloropyridine-3-carboxamide, (15.83) N-[1-(5-bromo-3-chloropyridin-2-yl)ethyl]-2-fluoro-4-iodopyridine-3-carboxamide, (15.84) N-{(E)-[(cyclopropylmethoxy)imino][6-(difluoromethoxy)-2,3-difluorophenyl]methyl}-2-phenylacetamide (221201-92-9), (15.85) N-{(Z)-[(cyclopropylmethoxy)imino][6-(difluoromethoxy)-2,3-difluorophenyl]methyl}-2-phenylacetamide (221201-92-9), (15.86) N'-{4-[(3-tert-butyl-4-cyano-1,2-thiazol-5-yl)oxy]-2-chloro-5-methylphenyl}-N-ethyl-N-methylimidoformamide, (15.87) N-methyl-2-(1-{[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]acetyl}piperidin-4-yl)-N-(1,2,3,4-tetrahydronaphthalen-1-yl)-1,3-thiazole-4-carboxamide (922514-49-6) (WO 2007014290), (15.88) N-methyl-2-(1-{[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]acetyl}piperidin-4-yl)-N-[(1R)-1,2,3,4-tetrahydronaphthalen-1-yl]-1,3-thiazole-4-carboxamide (922514-07-6) (WO 2007014290), (15.89) N-methyl-2-(1-{[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]acetyl}piperidin-4-yl)-N-[(1S)-1,2,3,4-tetrahydronaphthalen-1-yl]-1,3-thiazole-4-carboxamide (922514-48-5) (WO 2007014290), (15.90) pentyl {6-[({[(1-methyl-1H-tetrazol-5-yl)(phenyl)methylidene]amino}oxy)methyl]pyridin-2-yl}carbamate, (15.91) phenazine-1-carboxylic acid, (15.92) quinolin-8-ol (134-31-6), (15.93) quinolin-8-ol sulfate (2:1) (134-31-6) and (15.94) tert-butyl {6-[({[(1-methyl-1H-tetrazol-5-yl)(phenyl)methylene]amino}oxy)methyl]pyridin-2-yl}carbamate.

(16) Further compounds, for example (16.1) 1-methyl-3-(trifluoromethyl)-N-[2'-(trifluoromethyl)biphenyl-2-yl]-1H-pyrazole-4-carboxamide, (16.2) N-(4'-chlorobiphenyl-2-yl)-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide, (16.3) N-(2',4'-dichlorobiphenyl-2-yl)-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide, (16.4) 3-(difluoromethyl)-1-methyl-N-[4'-(trifluoromethyl)biphenyl-2-yl]-1H-pyrazole-4-carboxamide, (16.5) N-(2',5'-difluorobiphenyl-2-yl)-1-methyl-3-(trifluoromethyl)-1H-pyrazole-4-carboxamide, (16.6) 3-(difluoromethyl)-1-methyl-N-[4'-(prop-1-yn-1-yl)biphenyl-2-yl]-1H-pyrazole-4-

carboxamide (known from WO 2004/058723), (16.7) 5-fluoro-1,3-dimethyl-N-[4'-(prop-1-yn-1-yl)biphenyl-2-yl]-1H-pyrazole-4-carboxamide (known from WO 2004/058723), (16.8) 2-chloro-N-[4'-(prop-1-yn-1-yl)biphenyl-2-yl]pyridine-3-carboxamide (known from WO 2004/058723), (16.9) 3-(difluoromethyl)-N-[4'-(3,3-dimethylbut-1-yn-1-yl)biphenyl-2-yl]-1-methyl-1H-pyrazole-4-carboxamide (known from WO 2004/058723), (16.10) N-[4'-(3,3-dimethylbut-1-yn-1-yl)biphenyl-2-yl]-5-fluoro-1,3-dimethyl-1H-pyrazole-4-carboxamide (known from WO 2004/058723), (16.11) 3-(difluoromethyl)-N-(4'-ethynylbiphenyl-2-yl)-1-methyl-1H-pyrazole-4-carboxamide (known from WO 2004/058723), (16.12) N-(4'-ethynylbiphenyl-2-yl)-5-fluoro-1,3-dimethyl-1H-pyrazole-4-carboxamide (known from WO 2004/058723), (16.13) 2-chloro-N-(4'-ethynylbiphenyl-2-yl)pyridine-3-carboxamide (known from WO 2004/058723), (16.14) 2-chloro-N-[4'-(3,3-dimethylbut-1-yn-1-yl)biphenyl-2-yl]pyridine-3-carboxamide (known from WO 2004/058723), (16.15) 4-(difluoromethyl)-2-methyl-N-[4'-(trifluoromethyl)biphenyl-2-yl]-1,3-thiazole-5-carboxamide (known from WO 2004/058723), (16.16) 5-fluoro-N-[4'-(3-hydroxy-3-methylbut-1-yn-1-yl)biphenyl-2-yl]-1,3-dimethyl-1H-pyrazole-4-carboxamide (known from WO 2004/058723), (16.17) 2-chloro-N-[4'-(3-hydroxy-3-methylbut-1-yn-1-yl)biphenyl-2-yl]pyridine-3-carboxamide (known from WO 2004/058723), (16.18) 3-(difluoromethyl)-N-[4'-(3-methoxy-3-methylbut-1-yn-1-yl)biphenyl-2-yl]-1-methyl-1H-pyrazole-4-carboxamide (known from WO 2004/058723), (16.19) 5-fluoro-N-[4'-(3-methoxy-3-methylbut-1-yn-1-yl)biphenyl-2-yl]-1,3-dimethyl-1H-pyrazole-4-carboxamide (known from WO 2004/058723), (16.20) 2-chloro-N-[4'-(3-methoxy-3-methylbut-1-yn-1-yl)biphenyl-2-yl]pyridine-3-carboxamide (known from WO 2004/058723), (16.21) (5-bromo-2-methoxy-4-methylpyridin-3-yl)(2,3,4-trimethoxy-6-methylphenyl)methanone (known from EP-A 1 559 320), (16.22) N-[2-(4-{[3-(4-chlorophenyl)prop-2-yn-1-yl]oxy}-3-methoxyphenyl)ethyl]-N2-(methylsulfonyl)valinamide (220706-93-4), (16.23) 4-oxo-4-[(2-phenylethyl)amino]butanoic acid and (16.24) but-3-yn-1-yl {6-[({[(Z)-(1-methyl-1H-tetrazol-5-yl)(phenyl)methylene]amino}oxy)methyl]pyridin-2-yl}carbamate.

All named mixing partners of the classes (1) to (16) can, if their functional groups enable this, optionally form salts with suitable bases or acids.

Particular preference is further given to combinations comprising at least one further active compound (B) selected from the following groups:

(2.1) bixafen, (2.2) boscalid, (2.6) fluopyram, (2.8) fluxapyroxad, (2.11) isopyrazam (mixture of syn-epimeric racemate 1RS,4SR,9RS and anti-epimeric racemate 1RS,4SR,9SR), (2.12) isopyrazam (anti-epimeric racemate 1RS,4SR,9SR), (2.13) isopyrazam (anti-epimeric enantiomer 1R,4S,9S), (2.14) isopyrazam (anti-epimeric enantiomer 1S,4R,9R), (2.15) isopyrazam (syn epimeric racemate 1RS,4SR,9RS), (2.16) isopyrazam (syn-epimeric enantiomer 1R,4S,9R), (2.17) isopyrazam (syn-epimeric enantiomer 1S,4R,9S), (2.27) N-[1-(2,4-dichlorophenyl)-1-methoxypropan-2-yl]-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide, (2.29) N-[9-(dichloromethylene)-1,2,3,4-tetrahydro-1,4-methanonaphthalen-5-yl]-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide, (3.1) ametoctradin,

(3.2) amisulbrom, (3.3) azoxystrobin, (3.4) cyazofamid, (3.9) famoxadone, (3.10) fenamidone, (3.12) fluoxastrobin, (3.16) picoxystrobin, (3.17) pyraclostrobin, (3.22) trifloxystrobin, (4.6) fluopicolide, (5.1) bordeaux mixture, (5.4) chlorothalonil, (5.5) copper hydroxide, (5.7) copper oxide, (5.8) copper oxychloride, (5.9) copper(2+) sulfate, (5.16) folpet, (5.23) mancozeb, (5.25) metiram, (5.26) metiram zinc, (5.29) propineb, (5.30) sulphur and sulphur preparations including calcium polysulphide, (7.7) pyrimethanil, (9.2) dimethomorph, (9.4) iprovalicarb, (9.5) mandipropamid, (10.9) propamocarb, (10.10) propamocarb hydrochloride, (12.9) metalaxyl, (12.10) metalaxyl-M (mefenoxam), (14.4) fluazinam, (15.9) cymoxanil, (15.24) fosetyl-aluminium, (15.25) fosetyl-calcium, (15.26) fosetyl-sodium, (15.41) phosphorous acid and its salts, (15.42) propamocarb-fosetylate, (15.54) 1-(4-{4-[(5R)-5-(2,6-difluorophenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)-2-[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]ethanone, (15.55) 1-(4-{4-[(5S)-5-(2,6-difluorophenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)-2-[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]ethanone, (15.56) 1-(4-{4-[5-(2,6-difluorophenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)-2-[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]ethanone, (15.60) 2,6-dimethyl-1H,5H-[1,4]dithiino[2,3-c:5,6-c']dipyrrole-1,3,5,7(2H,6H)-tetrone, (15.90) pentyl {6-[({[(1-methyl-1H-tetrazol-5-yl)(phenyl)methylidene]amino}oxy)methyl]pyridin-2-yl}carbamate.

All named mixing partners of the classes (1) to (15) can, if their functional groups enable this, optionally form salts with suitable bases or acids.

In a preferred embodiment this invention is directed to mixtures comprising the compound (I-1) as compound of formula (I) and one component (B), in particular the mixtures (I-1) + (1.1), (I-1) + (1.2), (I-1) + (1.3), (I-1) + (1.4), (I-1) + (1.5), (I-1) + (1.6), (I-1) + (1.7), (I-1) + (1.8), (I-1) + (1.9), (I-1) + (1.10), (I-1) + (1.11), (I-1) + (1.12), (I-1) + (1.13), (I-1) + (1.14), (I-1) + (1.15), (I-1) + (1.16), (I-1) + (1.17), (I-1) + (1.18), (I-1) + (1.19), (I-1) + (1.20), (I-1) + (1.21), (I-1) + (1.22), (I-1) + (1.23), (I-1) + (1.24), (I-1) + (1.25), (I-1) + (1.26), (I-1) + (1.27), (I-1) + (1.28), (I-1) + (1.29), (I-1) + (1.30), (I-1) + (1.31), (I-1) + (1.32), (I-1) + (1.33), (I-1) + (1.34), (I-1) + (1.35), (I-1) + (1.36), (I-1) + (1.37), (I-1) + (1.38), (I-1) + (1.39), (I-1) + (1.40), (I-1) + (1.41), (I-1) + (1.42), (I-1) + (1.43), (I-1) + (1.44), (I-1) + (1.45), (I-1) + (1.46), (I-1) + (1.47), (I-1) + (1.48), (I-1) + (1.49), (I-1) + (1.50), (I-1) + (1.51), (I-1) + (1.52), (I-1) + (1.53), (I-1) + (1.54), (I-1) + (1.55), (I-1) + (1.56), (I-1) + (1.57), (I-1) + (1.58), (I-1) + (1.59), (I-1) + (1.60), (I-1) + (1.61), (I-1) + (1.62), (I-1) + (1.63), (I-1) + (1.64), (I-1) + (2.1), (I-1) + (2.2), (I-1) + (2.3), (I-1) + (2.4), (I-1) + (2.5), (I-1) + (2.6), (I-1) + (2.7), (I-1) + (2.8), (I-1) + (2.9), (I-1) + (2.10), (I-1) + (2.11), (I-1) + (2.12), (I-1) + (2.13), (I-1) + (2.14), (I-1) + (2.15), (I-1) + (2.16), (I-1) + (2.17), (I-1) + (2.18), (I-1) + (2.19), (I-1) + (2.20), (I-1) + (2.21), (I-1) + (2.22), (I-1) + (2.23), (I-1) + (2.24), (I-1) + (2.25), (I-1) + (2.26), (I-1) + (2.27), (I-1) + (2.28), (I-1) + (2.29), (I-1) + (3.1), (I-1) + (3.2), (I-1) + (3.3), (I-1) + (3.4), (I-1) + (3.5), (I-1) + (3.6), (I-1) + (3.7), (I-1) + (3.8), (I-1) + (3.9), (I-1) + (3.10), (I-1) + (3.11), (I-1) + (3.12), (I-1) + (3.13), (I-1) + (3.14), (I-1) + (3.15), (I-1) + (3.16), (I-1) + (3.17), (I-1) + (3.18), (I-1) + (3.19), (I-1) + (3.20), (I-1) + (3.21), (I-1) + (3.22), (I-1) + (3.23), (I-1) + (3.24), (I-1) + (3.25), (I-1) + (3.26), (I-1) + (3.27),

(I-1) + (3.28), (I-1) + (3.29), (I-1) + (3.30), (I-1) + (3.31), (I-1) + (3.32), (I-1) + (3.33), (I-1) + (4.1), (I-1) + (4.2), (I-1) + (4.3), (I-1) + (4.4), (I-1) + (4.5), (I-1) + (4.6), (I-1) + (4.7), (I-1) + (4.8), (I-1) + (4.9), (I-1) + (4.10), (I-1) + (4.11), (I-1) + (4.12), (I-1) + (4.13), (I-1) + (4.14), (I-1) + (5.1), (I-1) + (5.2), (I-1) + (5.3), (I-1) + (5.4), (I-1) + (5.5), (I-1) + (5.6), (I-1) + (5.7), (I-1) + (5.8), (I-1) + (5.9), (I-1) + (5.10), (I-1) + (5.11), (I-1) + (5.12), (I-1) + (5.13), (I-1) + (5.14), (I-1) + (5.15), (I-1) + (5.16), (I-1) + (5.17), (I-1) + (5.18), (I-1) + (5.19), (I-1) + (5.20), (I-1) + (5.21), (I-1) + (5.22), (I-1) + (5.23), (I-1) + (5.24), (I-1) + (5.25), (I-1) + (5.26), (I-1) + (5.27), (I-1) + (5.28), (I-1) + (5.29), (I-1) + (5.30), (I-1) + (5.31), (I-1) + (5.32), (I-1) + (5.33), (I-1) + (5.34), (I-1) + (6.1), (I-1) + (6.2), (I-1) + (6.3), (I-1) + (6.4), (I-1) + (7.1), (I-1) + (7.2), (I-1) + (7.3), (I-1) + (7.4), (I-1) + (7.5), (I-1) + (7.6), (I-1) + (7.7), (I-1) + (7.8), (I-1) + (8.1), (I-1) + (8.2), (I-1) + (8.3), (I-1) + (8.4), (I-1) + (9.1), (I-1) + (9.2), (I-1) + (9.3), (I-1) + (9.4), (I-1) + (9.5), (I-1) + (9.6), (I-1) + (9.7), (I-1) + (9.8), (I-1) + (9.9), (I-1) + (10.1), (I-1) + (10.2), (I-1) + (10.3), (I-1) + (10.4), (I-1) + (10.5), (I-1) + (10.6), (I-1) + (10.7), (I-1) + (10.8), (I-1) + (10.9), (I-1) + (10.10), (I-1) + (10.11), (I-1) + (10.12), (I-1) + (10.13), (I-1) + (10.14), (I-1) + (10.15), (I-1) + (11.1), (I-1) + (11.2), (I-1) + (11.3), (I-1) + (11.4), (I-1) + (11.5), (I-1) + (11.6), (I-1) + (11.7), (I-1) + (12.1), (I-1) + (12.2), (I-1) + (12.3), (I-1) + (12.4), (I-1) + (12.5), (I-1) + (12.6), (I-1) + (12.7), (I-1) + (12.8), (I-1) + (12.9), (I-1) + (12.10), (I-1) + (12.11), (I-1) + (12.12), (I-1) + (12.13), (I-1) + (13.1), (I-1) + (13.2), (I-1) + (13.3), (I-1) + (13.4), (I-1) + (13.5), (I-1) + (13.6), (I-1) + (13.7), (I-1) + (14.1), (I-1) + (14.2), (I-1) + (14.3), (I-1) + (14.4), (I-1) + (14.5), (I-1) + (15.1), (I-1) + (15.2), (I-1) + (15.3), (I-1) + (15.4), (I-1) + (15.5), (I-1) + (15.6), (I-1) + (15.7), (I-1) + (15.8), (I-1) + (15.9), (I-1) + (15.10), (I-1) + (15.11), (I-1) + (15.12), (I-1) + (15.13), (I-1) + (15.14), (I-1) + (15.15), (I-1) + (15.16), (I-1) + (15.17), (I-1) + (15.18), (I-1) + (15.19), (I-1) + (15.20), (I-1) + (15.21), (I-1) + (15.22), (I-1) + (15.23), (I-1) + (15.24), (I-1) + (15.25), (I-1) + (15.26), (I-1) + (15.27), (I-1) + (15.28), (I-1) + (15.29), (I-1) + (15.30), (I-1) + (15.31), (I-1) + (15.32), (I-1) + (15.33), (I-1) + (15.34), (I-1) + (15.35), (I-1) + (15.36), (I-1) + (15.37), (I-1) + (15.38), (I-1) + (15.39), (I-1) + (15.41), (I-1) + (15.42), (I-1) + (15.43), (I-1) + (15.44), (I-1) + (15.45), (I-1) + (15.46), (I-1) + (15.47), (I-1) + (15.48), (I-1) + (15.49), (I-1) + (15.50), (I-1) + (15.51), (I-1) + (15.52), (I-1) + (15.53), (I-1) + (15.54), (I-1) + (15.55), (I-1) + (15.56), (I-1) + (15.57), (I-1) + (15.58), (I-1) + (15.59), (I-1) + (15.60), (I-1) + (15.61), (I-1) + (15.62), (I-1) + (15.63), (I-1) + (15.64), (I-1) + (15.65), (I-1) + (15.66), (I-1) + (15.67), (I-1) + (15.68), (I-1) + (15.69), (I-1) + (15.70), (I-1) + (15.71), (I-1) + (15.72), (I-1) + (15.73), (I-1) + (15.74), (I-1) + (15.75), (I-1) + (15.76), (I-1) + (15.77), (I-1) + (15.78), (I-1) + (15.79), (I-1) + (15.80), (I-1) + (15.81), (I-1) + (15.82), (I-1) + (15.83), (I-1) + (15.84), (I-1) + (15.85), (I-1) + (15.86), (I-1) + (15.87), (I-1) + (15.88), (I-1) + (15.89), (I-1) + (15.90), (I-1) + (15.91), (I-1) + (15.92), (I-1) + (15.93), (I-1) + (15.94).

In a further particularly preferred embodiment this invention is directed to mixtures comprising the compound (I-1) as compound of formula (I) and one component (B), in particular the mixtures (I-1) + (2.1), (I-1) + (2.2), (I-1) + (2.6), (I-1) + (2.8), (I-1) + (2.11), (I-1) + (2.12), (I-1) + (2.13), (I-1) + (2.14), (I-1) + (2.15), (I-1) + (2.16), (I-1) + (2.17), (I-1) + (2.29), (I-1) + (3.1), (I-1) + (3.2), (I-1) + (3.3), (I-1) + (3.4), (I-1) + (3.9), (I-1) + (3.10), (I-1) + (3.12), (I-1) + (3.16), (I-1) + (3.17), (I-1) + (3.22), (I-1) + (4.6), (I-1) + (5.1),

(I-1) + (5.4), (I-1) + (5.5), (I-1) + (5.7), (I-1) + (5.8), (I-1) + (5.9), (I-1) + (5.16), (I-1) + (5.23), (I-1) + (5.25), (I-1) + (5.26), (I-1) + (5.29), (I-1) + (5.30), (I-1) + (7.7), (I-1) + (9.2), (I-1) + (9.4), (I-1) + (9.5), (I-1) + (10.9), (I-1) + (10.10), (I-1) + (12.9), (I-1) + (12.10), (I-1) + (14.4), (I-1) + (15.9), (I-1) + (15.24), (I-1) + (15.25), (I-1) + (15.26), (I-1) + (15.41), (I-1) + (15.42), (I-1) + (15.54), (I-1) + (15.55), (I-1) + (15.56), (I-1) + (15.60), (I-1) + (15.90).

In a preferred embodiment this invention is directed to mixtures comprising the compound (I-2) as compound of formula (I) and one component (B), in particular the mixtures (I-2) + (1.1), (I-2) + (1.2), (I-2) + (1.3), (I-2) + (1.4), (I-2) + (1.5), (I-2) + (1.6), (I-2) + (1.7), (I-2) + (1.8), (I-2) + (1.9), (I-2) + (1.10), (I-2) + (1.11), (I-2) + (1.12), (I-2) + (1.13), (I-2) + (1.14), (I-2) + (1.15), (I-2) + (1.16), (I-2) + (1.17), (I-2) + (1.18), (I-2) + (1.19), (I-2) + (1.20), (I-2) + (1.21), (I-2) + (1.22), (I-2) + (1.23), (I-2) + (1.24), (I-2) + (1.25), (I-2) + (1.26), (I-2) + (1.27), (I-2) + (1.28), (I-2) + (1.29), (I-2) + (1.30), (I-2) + (1.31), (I-2) + (1.32), (I-2) + (1.33), (I-2) + (1.34), (I-2) + (1.35), (I-2) + (1.36), (I-2) + (1.37), (I-2) + (1.38), (I-2) + (1.39), (I-2) + (1.40), (I-2) + (1.41), (I-2) + (1.42), (I-2) + (1.43), (I-2) + (1.44), (I-2) + (1.45), (I-2) + (1.46), (I-2) + (1.47), (I-2) + (1.48), (I-2) + (1.49), (I-2) + (1.50), (I-2) + (1.51), (I-2) + (1.52), (I-2) + (1.53), (I-2) + (1.54), (I-2) + (1.55), (I-2) + (1.56), (I-2) + (1.57), (I-2) + (1.58), (I-2) + (1.59), (I-2) + (1.60), (I-2) + (1.61), (I-2) + (1.62), (I-2) + (1.63), (I-2) + (1.64), (I-2) + (2.1), (I-2) + (2.2), (I-2) + (2.3), (I-2) + (2.4), (I-2) + (2.5), (I-2) + (2.6), (I-2) + (2.7), (I-2) + (2.8), (I-2) + (2.9), (I-2) + (2.10), (I-2) + (2.11), (I-2) + (2.12), (I-2) + (2.13), (I-2) + (2.14), (I-2) + (2.15), (I-2) + (2.16), (I-2) + (2.17), (I-2) + (2.18), (I-2) + (2.19), (I-2) + (2.20), (I-2) + (2.21), (I-2) + (2.22), (I-2) + (2.23), (I-2) + (2.24), (I-2) + (2.25), (I-2) + (2.26), (I-2) + (2.27), (I-2) + (2.28), (I-2) + (2.29), (I-2) + (3.1), (I-2) + (3.2), (I-2) + (3.3), (I-2) + (3.4), (I-2) + (3.5), (I-2) + (3.6), (I-2) + (3.7), (I-2) + (3.8), (I-2) + (3.9), (I-2) + (3.10), (I-2) + (3.11), (I-2) + (3.12), (I-2) + (3.13), (I-2) + (3.14), (I-2) + (3.15), (I-2) + (3.16), (I-2) + (3.17), (I-2) + (3.18), (I-2) + (3.19), (I-2) + (3.20), (I-2) + (3.21), (I-2) + (3.22), (I-2) + (3.23), (I-2) + (3.24), (I-2) + (3.25), (I-2) + (3.26), (I-2) + (3.27), (I-2) + (3.28), (I-2) + (3.29), (I-2) + (3.30), (I-2) + (3.31), (I-2) + (3.32), (I-2) + (3.33), (I-2) + (4.1), (I-2) + (4.2), (I-2) + (4.3), (I-2) + (4.4), (I-2) + (4.5), (I-2) + (4.6), (I-2) + (4.7), (I-2) + (4.8), (I-2) + (4.9), (I-2) + (4.10), (I-2) + (4.11), (I-2) + (4.12), (I-2) + (4.13), (I-2) + (4.14), (I-2) + (5.1), (I-2) + (5.2), (I-2) + (5.3), (I-2) + (5.4), (I-2) + (5.5), (I-2) + (5.6), (I-2) + (5.7), (I-2) + (5.8), (I-2) + (5.9), (I-2) + (5.10), (I-2) + (5.11), (I-2) + (5.12), (I-2) + (5.13), (I-2) + (5.14), (I-2) + (5.15), (I-2) + (5.16), (I-2) + (5.17), (I-2) + (5.18), (I-2) + (5.19), (I-2) + (5.20), (I-2) + (5.21), (I-2) + (5.22), (I-2) + (5.23), (I-2) + (5.24), (I-2) + (5.25), (I-2) + (5.26), (I-2) + (5.27), (I-2) + (5.28), (I-2) + (5.29), (I-2) + (5.30), (I-2) + (5.31), (I-2) + (5.32), (I-2) + (5.33), (I-2) + (5.34), (I-2) + (6.1), (I-2) + (6.2), (I-2) + (6.3), (I-2) + (6.4), (I-2) + (7.1), (I-2) + (7.2), (I-2) + (7.3), (I-2) + (7.4), (I-2) + (7.5), (I-2) + (7.6), (I-2) + (7.7), (I-2) + (7.8), (I-2) + (8.1), (I-2) + (8.2), (I-2) + (8.3), (I-2) + (8.4), (I-2) + (9.1), (I-2) + (9.2), (I-2) + (9.3), (I-2) + (9.4), (I-2) + (9.5), (I-2) + (9.6), (I-2) + (9.7), (I-2) + (9.8), (I-2) + (9.9), (I-2) + (10.1), (I-2) + (10.2), (I-2) + (10.3), (I-2) + (10.4), (I-2) + (10.5), (I-2) + (10.6), (I-2) + (10.7), (I-2) + (10.8), (I-2) + (10.9), (I-2) + (10.10), (I-2) + (10.11), (I-2) + (10.12), (I-2) + (10.13), (I-2) + (10.14), (I-2) + (10.15), (I-2) + (11.1), (I-2) + (11.2), (I-2) + (11.3), (I-2) + (11.4), (I-2) + (11.5), (I-

2) + (11.6), (I-2) + (11.7), (I-2) + (12.1), (I-2) + (12.2), (I-2) + (12.3), (I-2) + (12.4), (I-2) + (12.5), (I-2) + (12.6), (I-2) + (12.7), (I-2) + (12.8), (I-2) + (12.9), (I-2) + (12.10), (I-2) + (12.11), (I-2) + (12.12), (I-2) + (12.13), (I-2) + (13.1), (I-2) + (13.2), (I-2) + (13.3), (I-2) + (13.4), (I-2) + (13.5), (I-2) + (13.6), (I-2) + (13.7), (I-2) + (14.1), (I-2) + (14.2), (I-2) + (14.3), (I-2) + (14.4), (I-2) + (14.5), (I-2) + (15.1), (I-2) + (15.2), (I-2) + (15.3), (I-2) + (15.4), (I-2) + (15.5), (I-2) + (15.6), (I-2) + (15.7), (I-2) + (15.8), (I-2) + (15.9), (I-2) + (15.10), (I-2) + (15.11), (I-2) + (15.12), (I-2) + (15.13), (I-2) + (15.14), (I-2) + (15.15), (I-2) + (15.16), (I-2) + (15.17), (I-2) + (15.18), (I-2) + (15.19), (I-2) + (15.20), (I-2) + (15.21), (I-2) + (15.22), (I-2) + (15.23), (I-2) + (15.24), (I-2) + (15.25), (I-2) + (15.26), (I-2) + (15.27), (I-2) + (15.28), (I-2) + (15.29), (I-2) + (15.30), (I-2) + (15.31), (I-2) + (15.32), (I-2) + (15.33), (I-2) + (15.34), (I-2) + (15.35), (I-2) + (15.36), (I-2) + (15.37), (I-2) + (15.38), (I-2) + (15.39), (I-2) + (15.41), (I-2) + (15.42), (I-2) + (15.43), (I-2) + (15.44), (I-2) + (15.45), (I-2) + (15.46), (I-2) + (15.47), (I-2) + (15.48), (I-2) + (15.49), (I-2) + (15.50), (I-2) + (15.51), (I-2) + (15.52), (I-2) + (15.53), (I-2) + (15.54), (I-2) + (15.55), (I-2) + (15.56), (I-2) + (15.57), (I-2) + (15.58), (I-2) + (15.59), (I-2) + (15.60), (I-2) + (15.61), (I-2) + (15.62), (I-2) + (15.63), (I-2) + (15.64), (I-2) + (15.65), (I-2) + (15.66), (I-2) + (15.67), (I-2) + (15.68), (I-2) + (15.69), (I-2) + (15.70), (I-2) + (15.71), (I-2) + (15.72), (I-2) + (15.73), (I-2) + (15.74), (I-2) + (15.75), (I-2) + (15.76), (I-2) + (15.77), (I-2) + (15.78), (I-2) + (15.79), (I-2) + (15.80), (I-2) + (15.81), (I-2) + (15.82), (I-2) + (15.83), (I-2) + (15.84), (I-2) + (15.85), (I-2) + (15.86), (I-2) + (15.87), (I-2) + (15.88), (I-2) + (15.89), (I-2) + (15.90), (I-2) + (15.91), (I-2) + (15.92), (I-2) + (15.93), (I-2) + (15.94).

In a further particularly preferred embodiment this invention is directed to mixtures comprising the compound (I-2) as compound of formula (I) and one component (B), in particular the mixtures (I-2) + (2.1), (I-2) + (2.2), (I-2) + (2.6), (I-2) + (2.8), (I-2) + (2.11), (I-2) + (2.12), (I-2) + (2.13), (I-2) + (2.14), (I-2) + (2.15), (I-2) + (2.16), (I-2) + (2.17), (I-2) + (2.29), (I-2) + (3.1), (I-2) + (3.2), (I-2) + (3.3), (I-2) + (3.4), (I-2) + (3.9), (I-2) + (3.10), (I-2) + (3.12), (I-2) + (3.16), (I-2) + (3.17), (I-2) + (3.22), (I-2) + (4.6), (I-2) + (5.1), (I-2) + (5.4), (I-2) + (5.5), (I-2) + (5.7), (I-2) + (5.8), (I-2) + (5.9), (I-2) + (5.16), (I-2) + (5.23), (I-2) + (5.25), (I-2) + (5.26), (I-2) + (5.29), (I-2) + (5.30), (I-2) + (7.7), (I-2) + (9.2), (I-2) + (9.4), (I-2) + (9.5), (I-2) + (10.9), (I-2) + (10.10), (I-2) + (12.9), (I-2) + (12.10), (I-2) + (14.4), (I-2) + (15.9), (I-2) + (15.24), (I-2) + (15.25), (I-2) + (15.26), (I-2) + (15.41), (I-2) + (15.42), (I-2) + (15.54), (I-2) + (15.55), (I-2) + (15.56), (I-2) + (15.60), (I-2) + (15.90).

In a preferred embodiment this invention is directed to mixtures comprising the compound (I-3) as compound of formula (I) and one component (B), in particular the mixtures (I-3) + (1.1), (I-3) + (1.2), (I-3) + (1.3), (I-3) + (1.4), (I-3) + (1.5), (I-3) + (1.6), (I-3) + (1.7), (I-3) + (1.8), (I-3) + (1.9), (I-3) + (1.10), (I-3) + (1.11), (I-3) + (1.12), (I-3) + (1.13), (I-3) + (1.14), (I-3) + (1.15), (I-3) + (1.16), (I-3) + (1.17), (I-3) + (1.18), (I-3) + (1.19), (I-3) + (1.20), (I-3) + (1.21), (I-3) + (1.22), (I-3) + (1.23), (I-3) + (1.24), (I-3) + (1.25), (I-3) + (1.26), (I-3) + (1.27), (I-3) + (1.28), (I-3) + (1.29), (I-3) + (1.30), (I-3) + (1.31), (I-3) + (1.32), (I-3) + (1.33), (I-3) + (1.34), (I-3) + (1.35), (I-3) + (1.36), (I-3) + (1.37), (I-3) + (1.38), (I-3) + (1.39), (I-3) + (1.40), (I-3) + (1.41), (I-3) + (1.42), (I-3) + (1.43), (I-3) + (1.44), (I-3) + (1.45), (I-3) + (1.46), (I-

3) + (1.47), (I-3) + (1.48), (I-3) + (1.49), (I-3) + (1.50), (I-3) + (1.51), (I-3) + (1.52), (I-3) + (1.53), (I-3) + (1.54), (I-3) + (1.55), (I-3) + (1.56), (I-3) + (1.57), (I-3) + (1.58), (I-3) + (1.59), (I-3) + (1.60), (I-3) + (1.61), (I-3) + (1.62), (I-3) + (1.63), (I-3) + (1.64), (I-3) + (2.1), (I-3) + (2.2), (I-3) + (2.3), (I-3) + (2.4), (I-3) + (2.5), (I-3) + (2.6), (I-3) + (2.7), (I-3) + (2.8), (I-3) + (2.9), (I-3) + (2.10), (I-3) + (2.11), (I-3) + (2.12), (I-3) + (2.13), (I-3) + (2.14), (I-3) + (2.15), (I-3) + (2.16), (I-3) + (2.17), (I-3) + (2.18), (I-3) + (2.19), (I-3) + (2.20), (I-3) + (2.21), (I-3) + (2.22), (I-3) + (2.23), (I-3) + (2.24), (I-3) + (2.25), (I-3) + (2.26), (I-3) + (2.27), (I-3) + (2.28), (I-3) + (2.29), (I-3) + (3.1), (I-3) + (3.2), (I-3) + (3.3), (I-3) + (3.4), (I-3) + (3.5), (I-3) + (3.6), (I-3) + (3.7), (I-3) + (3.8), (I-3) + (3.9), (I-3) + (3.10), (I-3) + (3.11), (I-3) + (3.12), (I-3) + (3.13), (I-3) + (3.14), (I-3) + (3.15), (I-3) + (3.16), (I-3) + (3.17), (I-3) + (3.18), (I-3) + (3.19), (I-3) + (3.20), (I-3) + (3.21), (I-3) + (3.22), (I-3) + (3.23), (I-3) + (3.24), (I-3) + (3.25), (I-3) + (3.26), (I-3) + (3.27), (I-3) + (3.28), (I-3) + (3.29), (I-3) + (3.30), (I-3) + (3.31), (I-3) + (3.32), (I-3) + (3.33), (I-3) + (4.1), (I-3) + (4.2), (I-3) + (4.3), (I-3) + (4.4), (I-3) + (4.5), (I-3) + (4.6), (I-3) + (4.7), (I-3) + (4.8), (I-3) + (4.9), (I-3) + (4.10), (I-3) + (4.11), (I-3) + (4.12), (I-3) + (4.13), (I-3) + (4.14), (I-3) + (5.1), (I-3) + (5.2), (I-3) + (5.3), (I-3) + (5.4), (I-3) + (5.5), (I-3) + (5.6), (I-3) + (5.7), (I-3) + (5.8), (I-3) + (5.9), (I-3) + (5.10), (I-3) + (5.11), (I-3) + (5.12), (I-3) + (5.13), (I-3) + (5.14), (I-3) + (5.15), (I-3) + (5.16), (I-3) + (5.17), (I-3) + (5.18), (I-3) + (5.19), (I-3) + (5.20), (I-3) + (5.21), (I-3) + (5.22), (I-3) + (5.23), (I-3) + (5.24), (I-3) + (5.25), (I-3) + (5.26), (I-3) + (5.27), (I-3) + (5.28), (I-3) + (5.29), (I-3) + (5.30), (I-3) + (5.31), (I-3) + (5.32), (I-3) + (5.33), (I-3) + (5.34), (I-3) + (6.1), (I-3) + (6.2), (I-3) + (6.3), (I-3) + (6.4), (I-3) + (7.1), (I-3) + (7.2), (I-3) + (7.3), (I-3) + (7.4), (I-3) + (7.5), (I-3) + (7.6), (I-3) + (7.7), (I-3) + (7.8), (I-3) + (8.1), (I-3) + (8.2), (I-3) + (8.3), (I-3) + (8.4), (I-3) + (9.1), (I-3) + (9.2), (I-3) + (9.3), (I-3) + (9.4), (I-3) + (9.5), (I-3) + (9.6), (I-3) + (9.7), (I-3) + (9.8), (I-3) + (9.9), (I-3) + (10.1), (I-3) + (10.2), (I-3) + (10.3), (I-3) + (10.4), (I-3) + (10.5), (I-3) + (10.6), (I-3) + (10.7), (I-3) + (10.8), (I-3) + (10.9), (I-3) + (10.10), (I-3) + (10.11), (I-3) + (10.12), (I-3) + (10.13), (I-3) + (10.14), (I-3) + (10.15), (I-3) + (11.1), (I-3) + (11.2), (I-3) + (11.3), (I-3) + (11.4), (I-3) + (11.5), (I-3) + (11.6), (I-3) + (11.7), (I-3) + (12.1), (I-3) + (12.2), (I-3) + (12.3), (I-3) + (12.4), (I-3) + (12.5), (I-3) + (12.6), (I-3) + (12.7), (I-3) + (12.8), (I-3) + (12.9), (I-3) + (12.10), (I-3) + (12.11), (I-3) + (12.12), (I-3) + (12.13), (I-3) + (13.1), (I-3) + (13.2), (I-3) + (13.3), (I-3) + (13.4), (I-3) + (13.5), (I-3) + (13.6), (I-3) + (13.7), (I-3) + (14.1), (I-3) + (14.2), (I-3) + (14.3), (I-3) + (14.4), (I-3) + (14.5), (I-3) + (15.1), (I-3) + (15.2), (I-3) + (15.3), (I-3) + (15.4), (I-3) + (15.5), (I-3) + (15.6), (I-3) + (15.7), (I-3) + (15.8), (I-3) + (15.9), (I-3) + (15.10), (I-3) + (15.11), (I-3) + (15.12), (I-3) + (15.13), (I-3) + (15.14), (I-3) + (15.15), (I-3) + (15.16), (I-3) + (15.17), (I-3) + (15.18), (I-3) + (15.19), (I-3) + (15.20), (I-3) + (15.21), (I-3) + (15.22), (I-3) + (15.23), (I-3) + (15.24), (I-3) + (15.25), (I-3) + (15.26), (I-3) + (15.27), (I-3) + (15.28), (I-3) + (15.29), (I-3) + (15.30), (I-3) + (15.31), (I-3) + (15.32), (I-3) + (15.33), (I-3) + (15.34), (I-3) + (15.35), (I-3) + (15.36), (I-3) + (15.37), (I-3) + (15.38), (I-3) + (15.39), (I-3) + (15.41), (I-3) + (15.42), (I-3) + (15.43), (I-3) + (15.44), (I-3) + (15.45), (I-3) + (15.46), (I-3) + (15.47), (I-3) + (15.48), (I-3) + (15.49), (I-3) + (15.50), (I-3) + (15.51), (I-3) + (15.52), (I-3) + (15.53), (I-3) + (15.54), (I-3) + (15.55), (I-3) + (15.56), (I-3) + (15.57), (I-3) + (15.58), (I-3) + (15.59), (I-3) + (15.60), (I-3) + (15.61), (I-3) + (15.62), (I-3) + (15.63), (I-3) + (15.64), (I-3) + (15.65), (I-3) + (15.66), (I-3) + (15.67), (I-3) + (15.68), (I-3) + (15.69), (I-3) + (15.70), (I-3) + (15.71), (I-3) + (15.72), (I-

3) + (15.73), (I-3) + (15.74), (I-3) + (15.75), (I-3) + (15.76), (I-3) + (15.77), (I-3) + (15.78), (I-3) + (15.79), (I-3) + (15.80), (I-3) + (15.81), (I-3) + (15.82), (I-3) + (15.83), (I-3) + (15.84), (I-3) + (15.85), (I-3) + (15.86), (I-3) + (15.87), (I-3) + (15.88), (I-3) + (15.89), (I-3) + (15.90), (I-3) + (15.91), (I-3) + (15.92), (I-3) + (15.93), (I-3) + (15.94).

In a further particularly preferred embodiment this invention is directed to mixtures comprising the compound (I-3) as compound of formula (I) and one component (B), in particular the mixtures (I-3) + (2.1), (I-3) + (2.2), (I-3) + (2.6), (I-3) + (2.8), (I-3) + (2.11), (I-3) + (2.12), (I-3) + (2.13), (I-3) + (2.14), (I-3) + (2.15), (I-3) + (2.16), (I-3) + (2.17), (I-3) + (2.29), (I-3) + (3.1), (I-3) + (3.2), (I-3) + (3.3), (I-3) + (3.4), (I-3) + (3.9), (I-3) + (3.10), (I-3) + (3.12), (I-3) + (3.16), (I-3) + (3.17), (I-3) + (3.22), (I-3) + (4.6), (I-3) + (5.1), (I-3) + (5.4), (I-3) + (5.5), (I-3) + (5.7), (I-3) + (5.8), (I-3) + (5.9), (I-3) + (5.16), (I-3) + (5.23), (I-3) + (5.25), (I-3) + (5.26), (I-3) + (5.29), (I-3) + (5.30), (I-3) + (7.7), (I-3) + (9.2), (I-3) + (9.4), (I-3) + (9.5), (I-3) + (10.9), (I-3) + (10.10), (I-3) + (12.9), (I-3) + (12.10), (I-3) + (14.4), (I-3) + (15.9), (I-3) + (15.24), (I-3) + (15.25), (I-3) + (15.26), (I-3) + (15.41), (I-3) + (15.42), (I-3) + (15.54), (I-3) + (15.55), (I-3) + (15.56), (I-3) + (15.60), (I-3) + (15.90).

In a preferred embodiment this invention is directed to mixtures comprising the compound (I-4) as compound of formula (I) and one component (B), in particular the mixtures (I-4) + (1.1), (I-4) + (1.2), (I-4) + (1.3), (I-4) + (1.4), (I-4) + (1.5), (I-4) + (1.6), (I-4) + (1.7), (I-4) + (1.8), (I-4) + (1.9), (I-4) + (1.10), (I-4) + (1.11), (I-4) + (1.12), (I-4) + (1.13), (I-4) + (1.14), (I-4) + (1.15), (I-4) + (1.16), (I-4) + (1.17), (I-4) + (1.18), (I-4) + (1.19), (I-4) + (1.20), (I-4) + (1.21), (I-4) + (1.22), (I-4) + (1.23), (I-4) + (1.24), (I-4) + (1.25), (I-4) + (1.26), (I-4) + (1.27), (I-4) + (1.28), (I-4) + (1.29), (I-4) + (1.30), (I-4) + (1.31), (I-4) + (1.32), (I-4) + (1.33), (I-4) + (1.34), (I-4) + (1.35), (I-4) + (1.36), (I-4) + (1.37), (I-4) + (1.38), (I-4) + (1.39), (I-4) + (1.40), (I-4) + (1.41), (I-4) + (1.42), (I-4) + (1.43), (I-4) + (1.44), (I-4) + (1.45), (I-4) + (1.46), (I-4) + (1.47), (I-4) + (1.48), (I-4) + (1.49), (I-4) + (1.50), (I-4) + (1.51), (I-4) + (1.52), (I-4) + (1.53), (I-4) + (1.54), (I-4) + (1.55), (I-4) + (1.56), (I-4) + (1.57), (I-4) + (1.58), (I-4) + (1.59), (I-4) + (1.60), (I-4) + (1.61), (I-4) + (1.62), (I-4) + (1.63), (I-4) + (1.64), (I-4) + (2.1), (I-4) + (2.2), (I-4) + (2.3), (I-4) + (2.4), (I-4) + (2.5), (I-4) + (2.6), (I-4) + (2.7), (I-4) + (2.8), (I-4) + (2.9), (I-4) + (2.10), (I-4) + (2.11), (I-4) + (2.12), (I-4) + (2.13), (I-4) + (2.14), (I-4) + (2.15), (I-4) + (2.16), (I-4) + (2.17), (I-4) + (2.18), (I-4) + (2.19), (I-4) + (2.20), (I-4) + (2.21), (I-4) + (2.22), (I-4) + (2.23), (I-4) + (2.24), (I-4) + (2.25), (I-4) + (2.26), (I-4) + (2.27), (I-4) + (2.28), (I-4) + (2.29), (I-4) + (3.1), (I-4) + (3.2), (I-4) + (3.3), (I-4) + (3.4), (I-4) + (3.5), (I-4) + (3.6), (I-4) + (3.7), (I-4) + (3.8), (I-4) + (3.9), (I-4) + (3.10), (I-4) + (3.11), (I-4) + (3.12), (I-4) + (3.13), (I-4) + (3.14), (I-4) + (3.15), (I-4) + (3.16), (I-4) + (3.17), (I-4) + (3.18), (I-4) + (3.19), (I-4) + (3.20), (I-4) + (3.21), (I-4) + (3.22), (I-4) + (3.23), (I-4) + (3.24), (I-4) + (3.25), (I-4) + (3.26), (I-4) + (3.27), (I-4) + (3.28), (I-4) + (3.29), (I-4) + (3.30), (I-4) + (3.31), (I-4) + (3.32), (I-4) + (3.33), (I-4) + (4.1), (I-4) + (4.2), (I-4) + (4.3), (I-4) + (4.4), (I-4) + (4.5), (I-4) + (4.6), (I-4) + (4.7), (I-4) + (4.8), (I-4) + (4.9), (I-4) + (4.10), (I-4) + (4.11), (I-4) + (4.12), (I-4) + (4.13), (I-4) + (4.14), (I-4) + (5.1), (I-4) + (5.2), (I-4) + (5.3), (I-4) + (5.4), (I-4) + (5.5), (I-4) + (5.6), (I-4) + (5.7), (I-4) + (5.8), (I-4) + (5.9), (I-4) + (5.10), (I-4) + (5.11), (I-4) + (5.12), (I-

4) + (5.13), (I-4) + (5.14), (I-4) + (5.15), (I-4) + (5.16), (I-4) + (5.17), (I-4) + (5.18), (I-4) + (5.19), (I-4) + (5.20), (I-4) + (5.21), (I-4) + (5.22), (I-4) + (5.23), (I-4) + (5.24), (I-4) + (5.25), (I-4) + (5.26), (I-4) + (5.27), (I-4) + (5.28), (I-4) + (5.29), (I-4) + (5.30), (I-4) + (5.31), (I-4) + (5.32), (I-4) + (5.33), (I-4) + (5.34), (I-4) + (6.1), (I-4) + (6.2), (I-4) + (6.3), (I-4) + (6.4), (I-4) + (7.1), (I-4) + (7.2), (I-4) + (7.3), (I-4) + (7.4), (I-4) + (7.5), (I-4) + (7.6), (I-4) + (7.7), (I-4) + (7.8), (I-4) + (8.1), (I-4) + (8.2), (I-4) + (8.3), (I-4) + (8.4), (I-4) + (9.1), (I-4) + (9.2), (I-4) + (9.3), (I-4) + (9.4), (I-4) + (9.5), (I-4) + (9.6), (I-4) + (9.7), (I-4) + (9.8), (I-4) + (9.9), (I-4) + (10.1), (I-4) + (10.2), (I-4) + (10.3), (I-4) + (10.4), (I-4) + (10.5), (I-4) + (10.6), (I-4) + (10.7), (I-4) + (10.8), (I-4) + (10.9), (I-4) + (10.10), (I-4) + (10.11), (I-4) + (10.12), (I-4) + (10.13), (I-4) + (10.14), (I-4) + (10.15), (I-4) + (11.1), (I-4) + (11.2), (I-4) + (11.3), (I-4) + (11.4), (I-4) + (11.5), (I-4) + (11.6), (I-4) + (11.7), (I-4) + (12.1), (I-4) + (12.2), (I-4) + (12.3), (I-4) + (12.4), (I-4) + (12.5), (I-4) + (12.6), (I-4) + (12.7), (I-4) + (12.8), (I-4) + (12.9), (I-4) + (12.10), (I-4) + (12.11), (I-4) + (12.12), (I-4) + (12.13), (I-4) + (13.1), (I-4) + (13.2), (I-4) + (13.3), (I-4) + (13.4), (I-4) + (13.5), (I-4) + (13.6), (I-4) + (13.7), (I-4) + (14.1), (I-4) + (14.2), (I-4) + (14.3), (I-4) + (14.4), (I-4) + (14.5), (I-4) + (15.1), (I-4) + (15.2), (I-4) + (15.3), (I-4) + (15.4), (I-4) + (15.5), (I-4) + (15.6), (I-4) + (15.7), (I-4) + (15.8), (I-4) + (15.9), (I-4) + (15.10), (I-4) + (15.11), (I-4) + (15.12), (I-4) + (15.13), (I-4) + (15.14), (I-4) + (15.15), (I-4) + (15.16), (I-4) + (15.17), (I-4) + (15.18), (I-4) + (15.19), (I-4) + (15.20), (I-4) + (15.21), (I-4) + (15.22), (I-4) + (15.23), (I-4) + (15.24), (I-4) + (15.25), (I-4) + (15.26), (I-4) + (15.27), (I-4) + (15.28), (I-4) + (15.29), (I-4) + (15.30), (I-4) + (15.31), (I-4) + (15.32), (I-4) + (15.33), (I-4) + (15.34), (I-4) + (15.35), (I-4) + (15.36), (I-4) + (15.37), (I-4) + (15.38), (I-4) + (15.39), (I-4) + (15.41), (I-4) + (15.42), (I-4) + (15.43), (I-4) + (15.44), (I-4) + (15.45), (I-4) + (15.46), (I-4) + (15.47), (I-4) + (15.48), (I-4) + (15.49), (I-4) + (15.50), (I-4) + (15.51), (I-4) + (15.52), (I-4) + (15.53), (I-4) + (15.54), (I-4) + (15.55), (I-4) + (15.56), (I-4) + (15.57), (I-4) + (15.58), (I-4) + (15.59), (I-4) + (15.60), (I-4) + (15.61), (I-4) + (15.62), (I-4) + (15.63), (I-4) + (15.64), (I-4) + (15.65), (I-4) + (15.66), (I-4) + (15.67), (I-4) + (15.68), (I-4) + (15.69), (I-4) + (15.70), (I-4) + (15.71), (I-4) + (15.72), (I-4) + (15.73), (I-4) + (15.74), (I-4) + (15.75), (I-4) + (15.76), (I-4) + (15.77), (I-4) + (15.78), (I-4) + (15.79), (I-4) + (15.80), (I-4) + (15.81), (I-4) + (15.82), (I-4) + (15.83), (I-4) + (15.84), (I-4) + (15.85), (I-4) + (15.86), (I-4) + (15.87), (I-4) + (15.88), (I-4) + (15.89), (I-4) + (15.90), (I-4) + (15.91), (I-4) + (15.92), (I-4) + (15.93), (I-4) + (15.94).

In a further particularly preferred embodiment this invention is directed to mixtures comprising the compound (I-4) as compound of formula (I) and one component (B), in particular the mixtures (I-4) + (2.1), (I-4) + (2.2), (I-4) + (2.6), (I-4) + (2.8), (I-4) + (2.11), (I-4) + (2.12), (I-4) + (2.13), (I-4) + (2.14), (I-4) + (2.15), (I-4) + (2.16), (I-4) + (2.17), (I-4) + (2.29), (I-4) + (3.1), (I-4) + (3.2), (I-4) + (3.3), (I-4) + (3.4), (I-4) + (3.9), (I-4) + (3.10), (I-4) + (3.12), (I-4) + (3.16), (I-4) + (3.17), (I-4) + (3.22), (I-4) + (4.6), (I-4) + (5.1), (I-4) + (5.4), (I-4) + (5.5), (I-4) + (5.7), (I-4) + (5.8), (I-4) + (5.9), (I-4) + (5.16), (I-4) + (5.23), (I-4) + (5.25), (I-4) + (5.26), (I-4) + (5.29), (I-4) + (5.30), (I-4) + (7.7), (I-4) + (9.2), (I-4) + (9.4), (I-4) + (9.5), (I-4) + (10.9), (I-4) + (10.10), (I-4) + (12.9), (I-4) + (12.10), (I-4) + (14.4), (I-4) + (15.9), (I-4) + (15.24), (I-4) + (15.25), (I-

4) + (15.26), (I-4) + (15.41), (I-4) + (15.42), (I-4) + (15.54), (I-4) + (15.55), (I-4) + (15.56), (I-4) + (15.60), (I-4) + (15.90).

In a preferred embodiment this invention is directed to mixtures comprising the compound (I-5) as compound of formula (I) and one component (B), in particular the mixtures (I-5) + (1.1), (I-5) + (1.2), (I-5) + (1.3), (I-5) + (1.4), (I-5) + (1.5), (I-5) + (1.6), (I-5) + (1.7), (I-5) + (1.8), (I-5) + (1.9), (I-5) + (1.10), (I-5) + (1.11), (I-5) + (1.12), (I-5) + (1.13), (I-5) + (1.14), (I-5) + (1.15), (I-5) + (1.16), (I-5) + (1.17), (I-5) + (1.18), (I-5) + (1.19), (I-5) + (1.20), (I-5) + (1.21), (I-5) + (1.22), (I-5) + (1.23), (I-5) + (1.24), (I-5) + (1.25), (I-5) + (1.26), (I-5) + (1.27), (I-5) + (1.28), (I-5) + (1.29), (I-5) + (1.30), (I-5) + (1.31), (I-5) + (1.32), (I-5) + (1.33), (I-5) + (1.34), (I-5) + (1.35), (I-5) + (1.36), (I-5) + (1.37), (I-5) + (1.38), (I-5) + (1.39), (I-5) + (1.40), (I-5) + (1.41), (I-5) + (1.42), (I-5) + (1.43), (I-5) + (1.44), (I-5) + (1.45), (I-5) + (1.46), (I-5) + (1.47), (I-5) + (1.48), (I-5) + (1.49), (I-5) + (1.50), (I-5) + (1.51), (I-5) + (1.52), (I-5) + (1.53), (I-5) + (1.54), (I-5) + (1.55), (I-5) + (1.56), (I-5) + (1.57), (I-5) + (1.58), (I-5) + (1.59), (I-5) + (1.60), (I-5) + (1.61), (I-5) + (1.62), (I-5) + (1.63), (I-5) + (1.64), (I-5) + (2.1), (I-5) + (2.2), (I-5) + (2.3), (I-5) + (2.4), (I-5) + (2.5), (I-5) + (2.6), (I-5) + (2.7), (I-5) + (2.8), (I-5) + (2.9), (I-5) + (2.10), (I-5) + (2.11), (I-5) + (2.12), (I-5) + (2.13), (I-5) + (2.14), (I-5) + (2.15), (I-5) + (2.16), (I-5) + (2.17), (I-5) + (2.18), (I-5) + (2.19), (I-5) + (2.20), (I-5) + (2.21), (I-5) + (2.22), (I-5) + (2.23), (I-5) + (2.24), (I-5) + (2.25), (I-5) + (2.26), (I-5) + (2.27), (I-5) + (2.28), (I-5) + (2.29), (I-5) + (3.1), (I-5) + (3.2), (I-5) + (3.3), (I-5) + (3.4), (I-5) + (3.5), (I-5) + (3.6), (I-5) + (3.7), (I-5) + (3.8), (I-5) + (3.9), (I-5) + (3.10), (I-5) + (3.11), (I-5) + (3.12), (I-5) + (3.13), (I-5) + (3.14), (I-5) + (3.15), (I-5) + (3.16), (I-5) + (3.17), (I-5) + (3.18), (I-5) + (3.19), (I-5) + (3.20), (I-5) + (3.21), (I-5) + (3.22), (I-5) + (3.23), (I-5) + (3.24), (I-5) + (3.25), (I-5) + (3.26), (I-5) + (3.27), (I-5) + (3.28), (I-5) + (3.29), (I-5) + (3.30), (I-5) + (3.31), (I-5) + (3.32), (I-5) + (3.33), (I-5) + (4.1), (I-5) + (4.2), (I-5) + (4.3), (I-5) + (4.4), (I-5) + (4.5), (I-5) + (4.6), (I-5) + (4.7), (I-5) + (4.8), (I-5) + (4.9), (I-5) + (4.10), (I-5) + (4.11), (I-5) + (4.12), (I-5) + (4.13), (I-5) + (4.14), (I-5) + (5.1), (I-5) + (5.2), (I-5) + (5.3), (I-5) + (5.4), (I-5) + (5.5), (I-5) + (5.6), (I-5) + (5.7), (I-5) + (5.8), (I-5) + (5.9), (I-5) + (5.10), (I-5) + (5.11), (I-5) + (5.12), (I-5) + (5.13), (I-5) + (5.14), (I-5) + (5.15), (I-5) + (5.16), (I-5) + (5.17), (I-5) + (5.18), (I-5) + (5.19), (I-5) + (5.20), (I-5) + (5.21), (I-5) + (5.22), (I-5) + (5.23), (I-5) + (5.24), (I-5) + (5.25), (I-5) + (5.26), (I-5) + (5.27), (I-5) + (5.28), (I-5) + (5.29), (I-5) + (5.30), (I-5) + (5.31), (I-5) + (5.32), (I-5) + (5.33), (I-5) + (5.34), (I-5) + (6.1), (I-5) + (6.2), (I-5) + (6.3), (I-5) + (6.4), (I-5) + (7.1), (I-5) + (7.2), (I-5) + (7.3), (I-5) + (7.4), (I-5) + (7.5), (I-5) + (7.6), (I-5) + (7.7), (I-5) + (7.8), (I-5) + (8.1), (I-5) + (8.2), (I-5) + (8.3), (I-5) + (8.4), (I-5) + (9.1), (I-5) + (9.2), (I-5) + (9.3), (I-5) + (9.4), (I-5) + (9.5), (I-5) + (9.6), (I-5) + (9.7), (I-5) + (9.8), (I-5) + (9.9), (I-5) + (10.1), (I-5) + (10.2), (I-5) + (10.3), (I-5) + (10.4), (I-5) + (10.5), (I-5) + (10.6), (I-5) + (10.7), (I-5) + (10.8), (I-5) + (10.9), (I-5) + (10.10), (I-5) + (10.11), (I-5) + (10.12), (I-5) + (10.13), (I-5) + (10.14), (I-5) + (10.15), (I-5) + (11.1), (I-5) + (11.2), (I-5) + (11.3), (I-5) + (11.4), (I-5) + (11.5), (I-5) + (11.6), (I-5) + (11.7), (I-5) + (12.1), (I-5) + (12.2), (I-5) + (12.3), (I-5) + (12.4), (I-5) + (12.5), (I-5) + (12.6), (I-5) + (12.7), (I-5) + (12.8), (I-5) + (12.9), (I-5) + (12.10), (I-5) + (12.11), (I-5) + (12.12), (I-5) + (12.13), (I-5) + (13.1), (I-5) + (13.2), (I-5) + (13.3), (I-5) + (13.4), (I-5) + (13.5), (I-5) + (13.6), (I-

5) + (13.7), (I-5) + (14.1), (I-5) + (14.2), (I-5) + (14.3), (I-5) + (14.4), (I-5) + (14.5), (I-5) + (15.1), (I-5) + (15.2), (I-5) + (15.3), (I-5) + (15.4), (I-5) + (15.5), (I-5) + (15.6), (I-5) + (15.7), (I-5) + (15.8), (I-5) + (15.9), (I-5) + (15.10), (I-5) + (15.11), (I-5) + (15.12), (I-5) + (15.13), (I-5) + (15.14), (I-5) + (15.15), (I-5) + (15.16), (I-5) + (15.17), (I-5) + (15.18), (I-5) + (15.19), (I-5) + (15.20), (I-5) + (15.21), (I-5) + (15.22), (I-5) + (15.23), (I-5) + (15.24), (I-5) + (15.25), (I-5) + (15.26), (I-5) + (15.27), (I-5) + (15.28), (I-5) + (15.29), (I-5) + (15.30), (I-5) + (15.31), (I-5) + (15.32), (I-5) + (15.33), (I-5) + (15.34), (I-5) + (15.35), (I-5) + (15.36), (I-5) + (15.37), (I-5) + (15.38), (I-5) + (15.39), (I-5) + (15.41), (I-5) + (15.42), (I-5) + (15.43), (I-5) + (15.44), (I-5) + (15.45), (I-5) + (15.46), (I-5) + (15.47), (I-5) + (15.48), (I-5) + (15.49), (I-5) + (15.50), (I-5) + (15.51), (I-5) + (15.52), (I-5) + (15.53), (I-5) + (15.54), (I-5) + (15.55), (I-5) + (15.56), (I-5) + (15.57), (I-5) + (15.58), (I-5) + (15.59), (I-5) + (15.60), (I-5) + (15.61), (I-5) + (15.62), (I-5) + (15.63), (I-5) + (15.64), (I-5) + (15.65), (I-5) + (15.66), (I-5) + (15.67), (I-5) + (15.68), (I-5) + (15.69), (I-5) + (15.70), (I-5) + (15.71), (I-5) + (15.72), (I-5) + (15.73), (I-5) + (15.74), (I-5) + (15.75), (I-5) + (15.76), (I-5) + (15.77), (I-5) + (15.78), (I-5) + (15.79), (I-5) + (15.80), (I-5) + (15.81), (I-5) + (15.82), (I-5) + (15.83), (I-5) + (15.84), (I-5) + (15.85), (I-5) + (15.86), (I-5) + (15.87), (I-5) + (15.88), (I-5) + (15.89), (I-5) + (15.90), (I-5) + (15.91), (I-5) + (15.92), (I-5) + (15.93), (I-5) + (15.94).

In a further particularly preferred embodiment this invention is directed to mixtures comprising the compound (I-5) as compound of formula (I) and one component (B), in particular the mixtures (I-5) + (2.1), (I-5) + (2.2), (I-5) + (2.6), (I-5) + (2.8), (I-5) + (2.11), (I-5) + (2.12), (I-5) + (2.13), (I-5) + (2.14), (I-5) + (2.15), (I-5) + (2.16), (I-5) + (2.17), (I-5) + (2.29), (I-5) + (3.1), (I-5) + (3.2), (I-5) + (3.3), (I-5) + (3.4), (I-5) + (3.9), (I-5) + (3.10), (I-5) + (3.12), (I-5) + (3.16), (I-5) + (3.17), (I-5) + (3.22), (I-5) + (4.6), (I-5) + (5.1), (I-5) + (5.4), (I-5) + (5.5), (I-5) + (5.7), (I-5) + (5.8), (I-5) + (5.9), (I-5) + (5.16), (I-5) + (5.23), (I-5) + (5.25), (I-5) + (5.26), (I-5) + (5.29), (I-5) + (5.30), (I-5) + (7.7), (I-5) + (9.2), (I-5) + (9.4), (I-5) + (9.5), (I-5) + (10.9), (I-5) + (10.10), (I-5) + (12.9), (I-5) + (12.10), (I-5) + (14.4), (I-5) + (15.9), (I-5) + (15.24), (I-5) + (15.25), (I-5) + (15.26), (I-5) + (15.41), (I-5) + (15.42), (I-5) + (15.54), (I-5) + (15.55), (I-5) + (15.56), (I-5) + (15.60), (I-5) + (15.90).

In a preferred embodiment this invention is directed to mixtures comprising the compound (I-6) as compound of formula (I) and one component (B), in particular the mixtures (I-6) + (1.1), (I-6) + (1.2), (I-6) + (1.3), (I-6) + (1.4), (I-6) + (1.5), (I-6) + (1.6), (I-6) + (1.7), (I-6) + (1.8), (I-6) + (1.9), (I-6) + (1.10), (I-6) + (1.11), (I-6) + (1.12), (I-6) + (1.13), (I-6) + (1.14), (I-6) + (1.15), (I-6) + (1.16), (I-6) + (1.17), (I-6) + (1.18), (I-6) + (1.19), (I-6) + (1.20), (I-6) + (1.21), (I-6) + (1.22), (I-6) + (1.23), (I-6) + (1.24), (I-6) + (1.25), (I-6) + (1.26), (I-6) + (1.27), (I-6) + (1.28), (I-6) + (1.29), (I-6) + (1.30), (I-6) + (1.31), (I-6) + (1.32), (I-6) + (1.33), (I-6) + (1.34), (I-6) + (1.35), (I-6) + (1.36), (I-6) + (1.37), (I-6) + (1.38), (I-6) + (1.39), (I-6) + (1.40), (I-6) + (1.41), (I-6) + (1.42), (I-6) + (1.43), (I-6) + (1.44), (I-6) + (1.45), (I-6) + (1.46), (I-6) + (1.47), (I-6) + (1.48), (I-6) + (1.49), (I-6) + (1.50), (I-6) + (1.51), (I-6) + (1.52), (I-6) + (1.53), (I-6) + (1.54), (I-6) + (1.55), (I-6) + (1.56), (I-6) + (1.57), (I-6) + (1.58), (I-6) + (1.59), (I-6) + (1.60), (I-6) + (1.61), (I-6) + (1.62), (I-6) + (1.63), (I-6) + (1.64), (I-6) + (2.1), (I-6) + (2.2), (I-6) + (2.3), (I-6) + (2.4), (I-

6) + (2.5), (I-6) + (2.6), (I-6) + (2.7), (I-6) + (2.8), (I-6) + (2.9), (I-6) + (2.10), (I-6) + (2.11), (I-6) + (2.12), (I-6) + (2.13), (I-6) + (2.14), (I-6) + (2.15), (I-6) + (2.16), (I-6) + (2.17), (I-6) + (2.18), (I-6) + (2.19), (I-6) + (2.20), (I-6) + (2.21), (I-6) + (2.22), (I-6) + (2.23), (I-6) + (2.24), (I-6) + (2.25), (I-6) + (2.26), (I-6) + (2.27), (I-6) + (2.28), (I-6) + (2.29), (I-6) + (3.1), (I-6) + (3.2), (I-6) + (3.3), (I-6) + (3.4), (I-6) + (3.5), (I-6) + (3.6), (I-6) + (3.7), (I-6) + (3.8), (I-6) + (3.9), (I-6) + (3.10), (I-6) + (3.11), (I-6) + (3.12), (I-6) + (3.13), (I-6) + (3.14), (I-6) + (3.15), (I-6) + (3.16), (I-6) + (3.17), (I-6) + (3.18), (I-6) + (3.19), (I-6) + (3.20), (I-6) + (3.21), (I-6) + (3.22), (I-6) + (3.23), (I-6) + (3.24), (I-6) + (3.25), (I-6) + (3.26), (I-6) + (3.27), (I-6) + (3.28), (I-6) + (3.29), (I-6) + (3.30), (I-6) + (3.31), (I-6) + (3.32), (I-6) + (3.33), (I-6) + (4.1), (I-6) + (4.2), (I-6) + (4.3), (I-6) + (4.4), (I-6) + (4.5), (I-6) + (4.6), (I-6) + (4.7), (I-6) + (4.8), (I-6) + (4.9), (I-6) + (4.10), (I-6) + (4.11), (I-6) + (4.12), (I-6) + (4.13), (I-6) + (4.14), (I-6) + (5.1), (I-6) + (5.2), (I-6) + (5.3), (I-6) + (5.4), (I-6) + (5.5), (I-6) + (5.6), (I-6) + (5.7), (I-6) + (5.8), (I-6) + (5.9), (I-6) + (5.10), (I-6) + (5.11), (I-6) + (5.12), (I-6) + (5.13), (I-6) + (5.14), (I-6) + (5.15), (I-6) + (5.16), (I-6) + (5.17), (I-6) + (5.18), (I-6) + (5.19), (I-6) + (5.20), (I-6) + (5.21), (I-6) + (5.22), (I-6) + (5.23), (I-6) + (5.24), (I-6) + (5.25), (I-6) + (5.26), (I-6) + (5.27), (I-6) + (5.28), (I-6) + (5.29), (I-6) + (5.30), (I-6) + (5.31), (I-6) + (5.32), (I-6) + (5.33), (I-6) + (5.34), (I-6) + (6.1), (I-6) + (6.2), (I-6) + (6.3), (I-6) + (6.4), (I-6) + (7.1), (I-6) + (7.2), (I-6) + (7.3), (I-6) + (7.4), (I-6) + (7.5), (I-6) + (7.6), (I-6) + (7.7), (I-6) + (7.8), (I-6) + (8.1), (I-6) + (8.2), (I-6) + (8.3), (I-6) + (8.4), (I-6) + (9.1), (I-6) + (9.2), (I-6) + (9.3), (I-6) + (9.4), (I-6) + (9.5), (I-6) + (9.6), (I-6) + (9.7), (I-6) + (9.8), (I-6) + (9.9), (I-6) + (10.1), (I-6) + (10.2), (I-6) + (10.3), (I-6) + (10.4), (I-6) + (10.5), (I-6) + (10.6), (I-6) + (10.7), (I-6) + (10.8), (I-6) + (10.9), (I-6) + (10.10), (I-6) + (10.11), (I-6) + (10.12), (I-6) + (10.13), (I-6) + (10.14), (I-6) + (10.15), (I-6) + (11.1), (I-6) + (11.2), (I-6) + (11.3), (I-6) + (11.4), (I-6) + (11.5), (I-6) + (11.6), (I-6) + (11.7), (I-6) + (12.1), (I-6) + (12.2), (I-6) + (12.3), (I-6) + (12.4), (I-6) + (12.5), (I-6) + (12.6), (I-6) + (12.7), (I-6) + (12.8), (I-6) + (12.9), (I-6) + (12.10), (I-6) + (12.11), (I-6) + (12.12), (I-6) + (12.13), (I-6) + (13.1), (I-6) + (13.2), (I-6) + (13.3), (I-6) + (13.4), (I-6) + (13.5), (I-6) + (13.6), (I-6) + (13.7), (I-6) + (14.1), (I-6) + (14.2), (I-6) + (14.3), (I-6) + (14.4), (I-6) + (14.5), (I-6) + (15.1), (I-6) + (15.2), (I-6) + (15.3), (I-6) + (15.4), (I-6) + (15.5), (I-6) + (15.6), (I-6) + (15.7), (I-6) + (15.8), (I-6) + (15.9), (I-6) + (15.10), (I-6) + (15.11), (I-6) + (15.12), (I-6) + (15.13), (I-6) + (15.14), (I-6) + (15.15), (I-6) + (15.16), (I-6) + (15.17), (I-6) + (15.18), (I-6) + (15.19), (I-6) + (15.20), (I-6) + (15.21), (I-6) + (15.22), (I-6) + (15.23), (I-6) + (15.24), (I-6) + (15.25), (I-6) + (15.26), (I-6) + (15.27), (I-6) + (15.28), (I-6) + (15.29), (I-6) + (15.30), (I-6) + (15.31), (I-6) + (15.32), (I-6) + (15.33), (I-6) + (15.34), (I-6) + (15.35), (I-6) + (15.36), (I-6) + (15.37), (I-6) + (15.38), (I-6) + (15.39), (I-6) + (15.41), (I-6) + (15.42), (I-6) + (15.43), (I-6) + (15.44), (I-6) + (15.45), (I-6) + (15.46), (I-6) + (15.47), (I-6) + (15.48), (I-6) + (15.49), (I-6) + (15.50), (I-6) + (15.51), (I-6) + (15.52), (I-6) + (15.53), (I-6) + (15.54), (I-6) + (15.55), (I-6) + (15.56), (I-6) + (15.57), (I-6) + (15.58), (I-6) + (15.59), (I-6) + (15.60), (I-6) + (15.61), (I-6) + (15.62), (I-6) + (15.63), (I-6) + (15.64), (I-6) + (15.65), (I-6) + (15.66), (I-6) + (15.67), (I-6) + (15.68), (I-6) + (15.69), (I-6) + (15.70), (I-6) + (15.71), (I-6) + (15.72), (I-6) + (15.73), (I-6) + (15.74), (I-6) + (15.75), (I-6) + (15.76), (I-6) + (15.77), (I-6) + (15.78), (I-6) + (15.79), (I-6) + (15.80), (I-6) + (15.81), (I-6) + (15.82), (I-6) + (15.83), (I-6) + (15.84), (I-6) + (15.85), (I-6) + (15.86), (I-

6) + (15.87), (I-6) + (15.88), (I-6) + (15.89), (I-6) + (15.90), (I-6) + (15.91), (I-6) + (15.92), (I-6) + (15.93), (I-6) + (15.94).

In a further particularly preferred embodiment this invention is directed to mixtures comprising the compound (I-6) as compound of formula (I) and one component (B), in particular the mixtures (I-6) + (2.1), (I-6) + (2.2), (I-6) + (2.6), (I-6) + (2.8), (I-6) + (2.11), (I-6) + (2.12), (I-6) + (2.13), (I-6) + (2.14), (I-6) + (2.15), (I-6) + (2.16), (I-6) + (2.17), (I-6) + (2.29), (I-6) + (3.1), (I-6) + (3.2), (I-6) + (3.3), (I-6) + (3.4), (I-6) + (3.9), (I-6) + (3.10), (I-6) + (3.12), (I-6) + (3.16), (I-6) + (3.17), (I-6) + (3.22), (I-6) + (4.6), (I-6) + (5.1), (I-6) + (5.4), (I-6) + (5.5), (I-6) + (5.7), (I-6) + (5.8), (I-6) + (5.9), (I-6) + (5.16), (I-6) + (5.23), (I-6) + (5.25), (I-6) + (5.26), (I-6) + (5.29), (I-6) + (5.30), (I-6) + (7.7), (I-6) + (9.2), (I-6) + (9.4), (I-6) + (9.5), (I-6) + (10.9), (I-6) + (10.10), (I-6) + (12.9), (I-6) + (12.10), (I-6) + (14.4), (I-6) + (15.9), (I-6) + (15.24), (I-6) + (15.25), (I-6) + (15.26), (I-6) + (15.41), (I-6) + (15.42), (I-6) + (15.54), (I-6) + (15.55), (I-6) + (15.56), (I-6) + (15.60), (I-6) + (15.90).

In a preferred embodiment this invention is directed to mixtures comprising the compound (I-7) as compound of formula (I) and one component (B), in particular the mixtures (I-7) + (1.1), (I-7) + (1.2), (I-7) + (1.3), (I-7) + (1.4), (I-7) + (1.5), (I-7) + (1.6), (I-7) + (1.7), (I-7) + (1.8), (I-7) + (1.9), (I-7) + (1.10), (I-7) + (1.11), (I-7) + (1.12), (I-7) + (1.13), (I-7) + (1.14), (I-7) + (1.15), (I-7) + (1.16), (I-7) + (1.17), (I-7) + (1.18), (I-7) + (1.19), (I-7) + (1.20), (I-7) + (1.21), (I-7) + (1.22), (I-7) + (1.23), (I-7) + (1.24), (I-7) + (1.25), (I-7) + (1.26), (I-7) + (1.27), (I-7) + (1.28), (I-7) + (1.29), (I-7) + (1.30), (I-7) + (1.31), (I-7) + (1.32), (I-7) + (1.33), (I-7) + (1.34), (I-7) + (1.35), (I-7) + (1.36), (I-7) + (1.37), (I-7) + (1.38), (I-7) + (1.39), (I-7) + (1.40), (I-7) + (1.41), (I-7) + (1.42), (I-7) + (1.43), (I-7) + (1.44), (I-7) + (1.45), (I-7) + (1.46), (I-7) + (1.47), (I-7) + (1.48), (I-7) + (1.49), (I-7) + (1.50), (I-7) + (1.51), (I-7) + (1.52), (I-7) + (1.53), (I-7) + (1.54), (I-7) + (1.55), (I-7) + (1.56), (I-7) + (1.57), (I-7) + (1.58), (I-7) + (1.59), (I-7) + (1.60), (I-7) + (1.61), (I-7) + (1.62), (I-7) + (1.63), (I-7) + (1.64), (I-7) + (2.1), (I-7) + (2.2), (I-7) + (2.3), (I-7) + (2.4), (I-7) + (2.5), (I-7) + (2.6), (I-7) + (2.7), (I-7) + (2.8), (I-7) + (2.9), (I-7) + (2.10), (I-7) + (2.11), (I-7) + (2.12), (I-7) + (2.13), (I-7) + (2.14), (I-7) + (2.15), (I-7) + (2.16), (I-7) + (2.17), (I-7) + (2.18), (I-7) + (2.19), (I-7) + (2.20), (I-7) + (2.21), (I-7) + (2.22), (I-7) + (2.23), (I-7) + (2.24), (I-7) + (2.25), (I-7) + (2.26), (I-7) + (2.27), (I-7) + (2.28), (I-7) + (2.29), (I-7) + (3.1), (I-7) + (3.2), (I-7) + (3.3), (I-7) + (3.4), (I-7) + (3.5), (I-7) + (3.6), (I-7) + (3.7), (I-7) + (3.8), (I-7) + (3.9), (I-7) + (3.10), (I-7) + (3.11), (I-7) + (3.12), (I-7) + (3.13), (I-7) + (3.14), (I-7) + (3.15), (I-7) + (3.16), (I-7) + (3.17), (I-7) + (3.18), (I-7) + (3.19), (I-7) + (3.20), (I-7) + (3.21), (I-7) + (3.22), (I-7) + (3.23), (I-7) + (3.24), (I-7) + (3.25), (I-7) + (3.26), (I-7) + (3.27), (I-7) + (3.28), (I-7) + (3.29), (I-7) + (3.30), (I-7) + (3.31), (I-7) + (3.32), (I-7) + (3.33), (I-7) + (4.1), (I-7) + (4.2), (I-7) + (4.3), (I-7) + (4.4), (I-7) + (4.5), (I-7) + (4.6), (I-7) + (4.7), (I-7) + (4.8), (I-7) + (4.9), (I-7) + (4.10), (I-7) + (4.11), (I-7) + (4.12), (I-7) + (4.13), (I-7) + (4.14), (I-7) + (5.1), (I-7) + (5.2), (I-7) + (5.3), (I-7) + (5.4), (I-7) + (5.5), (I-7) + (5.6), (I-7) + (5.7), (I-7) + (5.8), (I-7) + (5.9), (I-7) + (5.10), (I-7) + (5.11), (I-7) + (5.12), (I-7) + (5.13), (I-7) + (5.14), (I-7) + (5.15), (I-7) + (5.16), (I-7) + (5.17), (I-7) + (5.18), (I-7) + (5.19), (I-7) + (5.20), (I-7) + (5.21), (I-7) + (5.22), (I-7) + (5.23), (I-7) + (5.24), (I-7) + (5.25), (I-7) + (5.26), (I-

7) + (5.27), (I-7) + (5.28), (I-7) + (5.29), (I-7) + (5.30), (I-7) + (5.31), (I-7) + (5.32), (I-7) + (5.33), (I-7) + (5.34), (I-7) + (6.1), (I-7) + (6.2), (I-7) + (6.3), (I-7) + (6.4), (I-7) + (7.1), (I-7) + (7.2), (I-7) + (7.3), (I-7) + (7.4), (I-7) + (7.5), (I-7) + (7.6), (I-7) + (7.7), (I-7) + (7.8), (I-7) + (8.1), (I-7) + (8.2), (I-7) + (8.3), (I-7) + (8.4), (I-7) + (9.1), (I-7) + (9.2), (I-7) + (9.3), (I-7) + (9.4), (I-7) + (9.5), (I-7) + (9.6), (I-7) + (9.7), (I-7) + (9.8), (I-7) + (9.9), (I-7) + (10.1), (I-7) + (10.2), (I-7) + (10.3), (I-7) + (10.4), (I-7) + (10.5), (I-7) + (10.6), (I-7) + (10.7), (I-7) + (10.8), (I-7) + (10.9), (I-7) + (10.10), (I-7) + (10.11), (I-7) + (10.12), (I-7) + (10.13), (I-7) + (10.14), (I-7) + (10.15), (I-7) + (11.1), (I-7) + (11.2), (I-7) + (11.3), (I-7) + (11.4), (I-7) + (11.5), (I-7) + (11.6), (I-7) + (11.7), (I-7) + (12.1), (I-7) + (12.2), (I-7) + (12.3), (I-7) + (12.4), (I-7) + (12.5), (I-7) + (12.6), (I-7) + (12.7), (I-7) + (12.8), (I-7) + (12.9), (I-7) + (12.10), (I-7) + (12.11), (I-7) + (12.12), (I-7) + (12.13), (I-7) + (13.1), (I-7) + (13.2), (I-7) + (13.3), (I-7) + (13.4), (I-7) + (13.5), (I-7) + (13.6), (I-7) + (13.7), (I-7) + (14.1), (I-7) + (14.2), (I-7) + (14.3), (I-7) + (14.4), (I-7) + (14.5), (I-7) + (15.1), (I-7) + (15.2), (I-7) + (15.3), (I-7) + (15.4), (I-7) + (15.5), (I-7) + (15.6), (I-7) + (15.7), (I-7) + (15.8), (I-7) + (15.9), (I-7) + (15.10), (I-7) + (15.11), (I-7) + (15.12), (I-7) + (15.13), (I-7) + (15.14), (I-7) + (15.15), (I-7) + (15.16), (I-7) + (15.17), (I-7) + (15.18), (I-7) + (15.19), (I-7) + (15.20), (I-7) + (15.21), (I-7) + (15.22), (I-7) + (15.23), (I-7) + (15.24), (I-7) + (15.25), (I-7) + (15.26), (I-7) + (15.27), (I-7) + (15.28), (I-7) + (15.29), (I-7) + (15.30), (I-7) + (15.31), (I-7) + (15.32), (I-7) + (15.33), (I-7) + (15.34), (I-7) + (15.35), (I-7) + (15.36), (I-7) + (15.37), (I-7) + (15.38), (I-7) + (15.39), (I-7) + (15.41), (I-7) + (15.42), (I-7) + (15.43), (I-7) + (15.44), (I-7) + (15.45), (I-7) + (15.46), (I-7) + (15.47), (I-7) + (15.48), (I-7) + (15.49), (I-7) + (15.50), (I-7) + (15.51), (I-7) + (15.52), (I-7) + (15.53), (I-7) + (15.54), (I-7) + (15.55), (I-7) + (15.56), (I-7) + (15.57), (I-7) + (15.58), (I-7) + (15.59), (I-7) + (15.60), (I-7) + (15.61), (I-7) + (15.62), (I-7) + (15.63), (I-7) + (15.64), (I-7) + (15.65), (I-7) + (15.66), (I-7) + (15.67), (I-7) + (15.68), (I-7) + (15.69), (I-7) + (15.70), (I-7) + (15.71), (I-7) + (15.72), (I-7) + (15.73), (I-7) + (15.74), (I-7) + (15.75), (I-7) + (15.76), (I-7) + (15.77), (I-7) + (15.78), (I-7) + (15.79), (I-7) + (15.80), (I-7) + (15.81), (I-7) + (15.82), (I-7) + (15.83), (I-7) + (15.84), (I-7) + (15.85), (I-7) + (15.86), (I-7) + (15.87), (I-7) + (15.88), (I-7) + (15.89), (I-7) + (15.90), (I-7) + (15.91), (I-7) + (15.92), (I-7) + (15.93), (I-7) + (15.94).

In a further particularly preferred embodiment this invention is directed to mixtures comprising the compound (I-7) as compound of formula (I) and one component (B), in particular the mixtures (I-7) + (2.1), (I-7) + (2.2), (I-7) + (2.6), (I-7) + (2.8), (I-7) + (2.11), (I-7) + (2.12), (I-7) + (2.13), (I-7) + (2.14), (I-7) + (2.15), (I-7) + (2.16), (I-7) + (2.17), (I-7) + (2.29), (I-7) + (3.1), (I-7) + (3.2), (I-7) + (3.3), (I-7) + (3.4), (I-7) + (3.9), (I-7) + (3.10), (I-7) + (3.12), (I-7) + (3.16), (I-7) + (3.17), (I-7) + (3.22), (I-7) + (4.6), (I-7) + (5.1), (I-7) + (5.4), (I-7) + (5.5), (I-7) + (5.7), (I-7) + (5.8), (I-7) + (5.9), (I-7) + (5.16), (I-7) + (5.23), (I-7) + (5.25), (I-7) + (5.26), (I-7) + (5.29), (I-7) + (5.30), (I-7) + (7.7), (I-7) + (9.2), (I-7) + (9.4), (I-7) + (9.5), (I-7) + (10.9), (I-7) + (10.10), (I-7) + (12.9), (I-7) + (12.10), (I-7) + (14.4), (I-7) + (15.9), (I-7) + (15.24), (I-7) + (15.25), (I-7) + (15.26), (I-7) + (15.41), (I-7) + (15.42), (I-7) + (15.54), (I-7) + (15.55), (I-7) + (15.56), (I-7) + (15.60), (I-7) + (15.90).

In a preferred embodiment this invention is directed to mixtures comprising the compound (I-8) as compound of formula (I) and one component (B), in particular the mixtures (I-8) + (1.1), (I-8) + (1.2), (I-8) + (1.3), (I-8) + (1.4), (I-8) + (1.5), (I-8) + (1.6), (I-8) + (1.7), (I-8) + (1.8), (I-8) + (1.9), (I-8) + (1.10), (I-8) + (1.11), (I-8) + (1.12), (I-8) + (1.13), (I-8) + (1.14), (I-8) + (1.15), (I-8) + (1.16), (I-8) + (1.17), (I-8) + (1.18), (I-8) + (1.19), (I-8) + (1.20), (I-8) + (1.21), (I-8) + (1.22), (I-8) + (1.23), (I-8) + (1.24), (I-8) + (1.25), (I-8) + (1.26), (I-8) + (1.27), (I-8) + (1.28), (I-8) + (1.29), (I-8) + (1.30), (I-8) + (1.31), (I-8) + (1.32), (I-8) + (1.33), (I-8) + (1.34), (I-8) + (1.35), (I-8) + (1.36), (I-8) + (1.37), (I-8) + (1.38), (I-8) + (1.39), (I-8) + (1.40), (I-8) + (1.41), (I-8) + (1.42), (I-8) + (1.43), (I-8) + (1.44), (I-8) + (1.45), (I-8) + (1.46), (I-8) + (1.47), (I-8) + (1.48), (I-8) + (1.49), (I-8) + (1.50), (I-8) + (1.51), (I-8) + (1.52), (I-8) + (1.53), (I-8) + (1.54), (I-8) + (1.55), (I-8) + (1.56), (I-8) + (1.57), (I-8) + (1.58), (I-8) + (1.59), (I-8) + (1.60), (I-8) + (1.61), (I-8) + (1.62), (I-8) + (1.63), (I-8) + (1.64), (I-8) + (2.1), (I-8) + (2.2), (I-8) + (2.3), (I-8) + (2.4), (I-8) + (2.5), (I-8) + (2.6), (I-8) + (2.7), (I-8) + (2.8), (I-8) + (2.9), (I-8) + (2.10), (I-8) + (2.11), (I-8) + (2.12), (I-8) + (2.13), (I-8) + (2.14), (I-8) + (2.15), (I-8) + (2.16), (I-8) + (2.17), (I-8) + (2.18), (I-8) + (2.19), (I-8) + (2.20), (I-8) + (2.21), (I-8) + (2.22), (I-8) + (2.23), (I-8) + (2.24), (I-8) + (2.25), (I-8) + (2.26), (I-8) + (2.27), (I-8) + (2.28), (I-8) + (2.29), (I-8) + (3.1), (I-8) + (3.2), (I-8) + (3.3), (I-8) + (3.4), (I-8) + (3.5), (I-8) + (3.6), (I-8) + (3.7), (I-8) + (3.8), (I-8) + (3.9), (I-8) + (3.10), (I-8) + (3.11), (I-8) + (3.12), (I-8) + (3.13), (I-8) + (3.14), (I-8) + (3.15), (I-8) + (3.16), (I-8) + (3.17), (I-8) + (3.18), (I-8) + (3.19), (I-8) + (3.20), (I-8) + (3.21), (I-8) + (3.22), (I-8) + (3.23), (I-8) + (3.24), (I-8) + (3.25), (I-8) + (3.26), (I-8) + (3.27), (I-8) + (3.28), (I-8) + (3.29), (I-8) + (3.30), (I-8) + (3.31), (I-8) + (3.32), (I-8) + (3.33), (I-8) + (4.1), (I-8) + (4.2), (I-8) + (4.3), (I-8) + (4.4), (I-8) + (4.5), (I-8) + (4.6), (I-8) + (4.7), (I-8) + (4.8), (I-8) + (4.9), (I-8) + (4.10), (I-8) + (4.11), (I-8) + (4.12), (I-8) + (4.13), (I-8) + (4.14), (I-8) + (5.1), (I-8) + (5.2), (I-8) + (5.3), (I-8) + (5.4), (I-8) + (5.5), (I-8) + (5.6), (I-8) + (5.7), (I-8) + (5.8), (I-8) + (5.9), (I-8) + (5.10), (I-8) + (5.11), (I-8) + (5.12), (I-8) + (5.13), (I-8) + (5.14), (I-8) + (5.15), (I-8) + (5.16), (I-8) + (5.17), (I-8) + (5.18), (I-8) + (5.19), (I-8) + (5.20), (I-8) + (5.21), (I-8) + (5.22), (I-8) + (5.23), (I-8) + (5.24), (I-8) + (5.25), (I-8) + (5.26), (I-8) + (5.27), (I-8) + (5.28), (I-8) + (5.29), (I-8) + (5.30), (I-8) + (5.31), (I-8) + (5.32), (I-8) + (5.33), (I-8) + (5.34), (I-8) + (6.1), (I-8) + (6.2), (I-8) + (6.3), (I-8) + (6.4), (I-8) + (7.1), (I-8) + (7.2), (I-8) + (7.3), (I-8) + (7.4), (I-8) + (7.5), (I-8) + (7.6), (I-8) + (7.7), (I-8) + (7.8), (I-8) + (8.1), (I-8) + (8.2), (I-8) + (8.3), (I-8) + (8.4), (I-8) + (9.1), (I-8) + (9.2), (I-8) + (9.3), (I-8) + (9.4), (I-8) + (9.5), (I-8) + (9.6), (I-8) + (9.7), (I-8) + (9.8), (I-8) + (9.9), (I-8) + (10.1), (I-8) + (10.2), (I-8) + (10.3), (I-8) + (10.4), (I-8) + (10.5), (I-8) + (10.6), (I-8) + (10.7), (I-8) + (10.8), (I-8) + (10.9), (I-8) + (10.10), (I-8) + (10.11), (I-8) + (10.12), (I-8) + (10.13), (I-8) + (10.14), (I-8) + (10.15), (I-8) + (11.1), (I-8) + (11.2), (I-8) + (11.3), (I-8) + (11.4), (I-8) + (11.5), (I-8) + (11.6), (I-8) + (11.7), (I-8) + (12.1), (I-8) + (12.2), (I-8) + (12.3), (I-8) + (12.4), (I-8) + (12.5), (I-8) + (12.6), (I-8) + (12.7), (I-8) + (12.8), (I-8) + (12.9), (I-8) + (12.10), (I-8) + (12.11), (I-8) + (12.12), (I-8) + (12.13), (I-8) + (13.1), (I-8) + (13.2), (I-8) + (13.3), (I-8) + (13.4), (I-8) + (13.5), (I-8) + (13.6), (I-8) + (13.7), (I-8) + (14.1), (I-8) + (14.2), (I-8) + (14.3), (I-8) + (14.4), (I-8) + (14.5), (I-8) + (15.1), (I-8) + (15.2), (I-8) + (15.3), (I-8) + (15.4), (I-8) + (15.5), (I-8) + (15.6), (I-8) + (15.7), (I-8) + (15.8), (I-8) + (15.9), (I-8) + (15.10), (I-8) + (15.11), (I-8) + (15.12), (I-8) + (15.13), (I-8) + (15.14), (I-8) + (15.15), (I-

8) + (15.16), (I-8) + (15.17), (I-8) + (15.18), (I-8) + (15.19), (I-8) + (15.20), (I-8) + (15.21), (I-8) + (15.22), (I-8) + (15.23), (I-8) + (15.24), (I-8) + (15.25), (I-8) + (15.26), (I-8) + (15.27), (I-8) + (15.28), (I-8) + (15.29), (I-8) + (15.30), (I-8) + (15.31), (I-8) + (15.32), (I-8) + (15.33), (I-8) + (15.34), (I-8) + (15.35), (I-8) + (15.36), (I-8) + (15.37), (I-8) + (15.38), (I-8) + (15.39), (I-8) + (15.41), (I-8) + (15.42), (I-8) + (15.43), (I-8) + (15.44), (I-8) + (15.45), (I-8) + (15.46), (I-8) + (15.47), (I-8) + (15.48), (I-8) + (15.49), (I-8) + (15.50), (I-8) + (15.51), (I-8) + (15.52), (I-8) + (15.53), (I-8) + (15.54), (I-8) + (15.55), (I-8) + (15.56), (I-8) + (15.57), (I-8) + (15.58), (I-8) + (15.59), (I-8) + (15.60), (I-8) + (15.61), (I-8) + (15.62), (I-8) + (15.63), (I-8) + (15.64), (I-8) + (15.65), (I-8) + (15.66), (I-8) + (15.67), (I-8) + (15.68), (I-8) + (15.69), (I-8) + (15.70), (I-8) + (15.71), (I-8) + (15.72), (I-8) + (15.73), (I-8) + (15.74), (I-8) + (15.75), (I-8) + (15.76), (I-8) + (15.77), (I-8) + (15.78), (I-8) + (15.79), (I-8) + (15.80), (I-8) + (15.81), (I-8) + (15.82), (I-8) + (15.83), (I-8) + (15.84), (I-8) + (15.85), (I-8) + (15.86), (I-8) + (15.87), (I-8) + (15.88), (I-8) + (15.89), (I-8) + (15.90), (I-8) + (15.91), (I-8) + (15.92), (I-8) + (15.93), (I-8) + (15.94).

In a further particularly preferred embodiment this invention is directed to mixtures comprising the compound (I-8) as compound of formula (I) and one component (B), in particular the mixtures (I-8) + (2.1), (I-8) + (2.2), (I-8) + (2.6), (I-8) + (2.8), (I-8) + (2.11), (I-8) + (2.12), (I-8) + (2.13), (I-8) + (2.14), (I-8) + (2.15), (I-8) + (2.16), (I-8) + (2.17), (I-8) + (2.29), (I-8) + (3.1), (I-8) + (3.2), (I-8) + (3.3), (I-8) + (3.4), (I-8) + (3.9), (I-8) + (3.10), (I-8) + (3.12), (I-8) + (3.16), (I-8) + (3.17), (I-8) + (3.22), (I-8) + (4.6), (I-8) + (5.1), (I-8) + (5.4), (I-8) + (5.5), (I-8) + (5.7), (I-8) + (5.8), (I-8) + (5.9), (I-8) + (5.16), (I-8) + (5.23), (I-8) + (5.25), (I-8) + (5.26), (I-8) + (5.29), (I-8) + (5.30), (I-8) + (7.7), (I-8) + (9.2), (I-8) + (9.4), (I-8) + (9.5), (I-8) + (10.9), (I-8) + (10.10), (I-8) + (12.9), (I-8) + (12.10), (I-8) + (14.4), (I-8) + (15.9), (I-8) + (15.24), (I-8) + (15.25), (I-8) + (15.26), (I-8) + (15.41), (I-8) + (15.42), (I-8) + (15.54), (I-8) + (15.55), (I-8) + (15.56), (I-8) + (15.60), (I-8) + (15.90).

In a preferred embodiment this invention is directed to mixtures comprising the compound (I-9) as compound of formula (I) and one component (B), in particular the mixtures (I-9) + (1.1), (I-9) + (1.2), (I-9) + (1.3), (I-9) + (1.4), (I-9) + (1.5), (I-9) + (1.6), (I-9) + (1.7), (I-9) + (1.8), (I-9) + (1.9), (I-9) + (1.10), (I-9) + (1.11), (I-9) + (1.12), (I-9) + (1.13), (I-9) + (1.14), (I-9) + (1.15), (I-9) + (1.16), (I-9) + (1.17), (I-9) + (1.18), (I-9) + (1.19), (I-9) + (1.20), (I-9) + (1.21), (I-9) + (1.22), (I-9) + (1.23), (I-9) + (1.24), (I-9) + (1.25), (I-9) + (1.26), (I-9) + (1.27), (I-9) + (1.28), (I-9) + (1.29), (I-9) + (1.30), (I-9) + (1.31), (I-9) + (1.32), (I-9) + (1.33), (I-9) + (1.34), (I-9) + (1.35), (I-9) + (1.36), (I-9) + (1.37), (I-9) + (1.38), (I-9) + (1.39), (I-9) + (1.40), (I-9) + (1.41), (I-9) + (1.42), (I-9) + (1.43), (I-9) + (1.44), (I-9) + (1.45), (I-9) + (1.46), (I-9) + (1.47), (I-9) + (1.48), (I-9) + (1.49), (I-9) + (1.50), (I-9) + (1.51), (I-9) + (1.52), (I-9) + (1.53), (I-9) + (1.54), (I-9) + (1.55), (I-9) + (1.56), (I-9) + (1.57), (I-9) + (1.58), (I-9) + (1.59), (I-9) + (1.60), (I-9) + (1.61), (I-9) + (1.62), (I-9) + (1.63), (I-9) + (1.64), (I-9) + (2.1), (I-9) + (2.2), (I-9) + (2.3), (I-9) + (2.4), (I-9) + (2.5), (I-9) + (2.6), (I-9) + (2.7), (I-9) + (2.8), (I-9) + (2.9), (I-9) + (2.10), (I-9) + (2.11), (I-9) + (2.12), (I-9) + (2.13), (I-9) + (2.14), (I-9) + (2.15), (I-9) + (2.16), (I-9) + (2.17), (I-9) + (2.18), (I-9) + (2.19), (I-9) + (2.20), (I-9) + (2.21), (I-9) + (2.22), (I-9) + (2.23), (I-9) + (2.24), (I-9) + (2.25), (I-9) + (2.26), (I-

9) + (2.27), (I-9) + (2.28), (I-9) + (2.29), (I-9) + (3.1), (I-9) + (3.2), (I-9) + (3.3), (I-9) + (3.4), (I-9) + (3.5), (I-9) + (3.6), (I-9) + (3.7), (I-9) + (3.8), (I-9) + (3.9), (I-9) + (3.10), (I-9) + (3.11), (I-9) + (3.12), (I-9) + (3.13), (I-9) + (3.14), (I-9) + (3.15), (I-9) + (3.16), (I-9) + (3.17), (I-9) + (3.18), (I-9) + (3.19), (I-9) + (3.20), (I-9) + (3.21), (I-9) + (3.22), (I-9) + (3.23), (I-9) + (3.24), (I-9) + (3.25), (I-9) + (3.26), (I-9) + (3.27), (I-9) + (3.28), (I-9) + (3.29), (I-9) + (3.30), (I-9) + (3.31), (I-9) + (3.32), (I-9) + (3.33), (I-9) + (4.1), (I-9) + (4.2), (I-9) + (4.3), (I-9) + (4.4), (I-9) + (4.5), (I-9) + (4.6), (I-9) + (4.7), (I-9) + (4.8), (I-9) + (4.9), (I-9) + (4.10), (I-9) + (4.11), (I-9) + (4.12), (I-9) + (4.13), (I-9) + (4.14), (I-9) + (5.1), (I-9) + (5.2), (I-9) + (5.3), (I-9) + (5.4), (I-9) + (5.5), (I-9) + (5.6), (I-9) + (5.7), (I-9) + (5.8), (I-9) + (5.9), (I-9) + (5.10), (I-9) + (5.11), (I-9) + (5.12), (I-9) + (5.13), (I-9) + (5.14), (I-9) + (5.15), (I-9) + (5.16), (I-9) + (5.17), (I-9) + (5.18), (I-9) + (5.19), (I-9) + (5.20), (I-9) + (5.21), (I-9) + (5.22), (I-9) + (5.23), (I-9) + (5.24), (I-9) + (5.25), (I-9) + (5.26), (I-9) + (5.27), (I-9) + (5.28), (I-9) + (5.29), (I-9) + (5.30), (I-9) + (5.31), (I-9) + (5.32), (I-9) + (5.33), (I-9) + (5.34), (I-9) + (6.1), (I-9) + (6.2), (I-9) + (6.3), (I-9) + (6.4), (I-9) + (7.1), (I-9) + (7.2), (I-9) + (7.3), (I-9) + (7.4), (I-9) + (7.5), (I-9) + (7.6), (I-9) + (7.7), (I-9) + (7.8), (I-9) + (8.1), (I-9) + (8.2), (I-9) + (8.3), (I-9) + (8.4), (I-9) + (9.1), (I-9) + (9.2), (I-9) + (9.3), (I-9) + (9.4), (I-9) + (9.5), (I-9) + (9.6), (I-9) + (9.7), (I-9) + (9.8), (I-9) + (9.9), (I-9) + (10.1), (I-9) + (10.2), (I-9) + (10.3), (I-9) + (10.4), (I-9) + (10.5), (I-9) + (10.6), (I-9) + (10.7), (I-9) + (10.8), (I-9) + (10.9), (I-9) + (10.10), (I-9) + (10.11), (I-9) + (10.12), (I-9) + (10.13), (I-9) + (10.14), (I-9) + (10.15), (I-9) + (11.1), (I-9) + (11.2), (I-9) + (11.3), (I-9) + (11.4), (I-9) + (11.5), (I-9) + (11.6), (I-9) + (11.7), (I-9) + (12.1), (I-9) + (12.2), (I-9) + (12.3), (I-9) + (12.4), (I-9) + (12.5), (I-9) + (12.6), (I-9) + (12.7), (I-9) + (12.8), (I-9) + (12.9), (I-9) + (12.10), (I-9) + (12.11), (I-9) + (12.12), (I-9) + (12.13), (I-9) + (13.1), (I-9) + (13.2), (I-9) + (13.3), (I-9) + (13.4), (I-9) + (13.5), (I-9) + (13.6), (I-9) + (13.7), (I-9) + (14.1), (I-9) + (14.2), (I-9) + (14.3), (I-9) + (14.4), (I-9) + (14.5), (I-9) + (15.1), (I-9) + (15.2), (I-9) + (15.3), (I-9) + (15.4), (I-9) + (15.5), (I-9) + (15.6), (I-9) + (15.7), (I-9) + (15.8), (I-9) + (15.9), (I-9) + (15.10), (I-9) + (15.11), (I-9) + (15.12), (I-9) + (15.13), (I-9) + (15.14), (I-9) + (15.15), (I-9) + (15.16), (I-9) + (15.17), (I-9) + (15.18), (I-9) + (15.19), (I-9) + (15.20), (I-9) + (15.21), (I-9) + (15.22), (I-9) + (15.23), (I-9) + (15.24), (I-9) + (15.25), (I-9) + (15.26), (I-9) + (15.27), (I-9) + (15.28), (I-9) + (15.29), (I-9) + (15.30), (I-9) + (15.31), (I-9) + (15.32), (I-9) + (15.33), (I-9) + (15.34), (I-9) + (15.35), (I-9) + (15.36), (I-9) + (15.37), (I-9) + (15.38), (I-9) + (15.39), (I-9) + (15.41), (I-9) + (15.42), (I-9) + (15.43), (I-9) + (15.44), (I-9) + (15.45), (I-9) + (15.46), (I-9) + (15.47), (I-9) + (15.48), (I-9) + (15.49), (I-9) + (15.50), (I-9) + (15.51), (I-9) + (15.52), (I-9) + (15.53), (I-9) + (15.54), (I-9) + (15.55), (I-9) + (15.56), (I-9) + (15.57), (I-9) + (15.58), (I-9) + (15.59), (I-9) + (15.60), (I-9) + (15.61), (I-9) + (15.62), (I-9) + (15.63), (I-9) + (15.64), (I-9) + (15.65), (I-9) + (15.66), (I-9) + (15.67), (I-9) + (15.68), (I-9) + (15.69), (I-9) + (15.70), (I-9) + (15.71), (I-9) + (15.72), (I-9) + (15.73), (I-9) + (15.74), (I-9) + (15.75), (I-9) + (15.76), (I-9) + (15.77), (I-9) + (15.78), (I-9) + (15.79), (I-9) + (15.80), (I-9) + (15.81), (I-9) + (15.82), (I-9) + (15.83), (I-9) + (15.84), (I-9) + (15.85), (I-9) + (15.86), (I-9) + (15.87), (I-9) + (15.88), (I-9) + (15.89), (I-9) + (15.90), (I-9) + (15.91), (I-9) + (15.92), (I-9) + (15.93), (I-9) + (15.94).

In a further particularly preferred embodiment this invention is directed to mixtures comprising the compound (I-9) as compound of formula (I) and one component (B), in particular the mixtures (I-9) + (2.1), (I-9) + (2.2), (I-9) + (2.6), (I-9) + (2.8), (I-9) + (2.11), (I-9) + (2.12), (I-9) + (2.13), (I-9) + (2.14), (I-9) + (2.15), (I-9) + (2.16), (I-9) + (2.17), (I-9) + (2.29), (I-9) + (3.1), (I-9) + (3.2), (I-9) + (3.3), (I-9) + (3.4), (I-9) + (3.9), (I-9) + (3.10), (I-9) + (3.12), (I-9) + (3.16), (I-9) + (3.17), (I-9) + (3.22), (I-9) + (4.6), (I-9) + (5.1), (I-9) + (5.4), (I-9) + (5.5), (I-9) + (5.7), (I-9) + (5.8), (I-9) + (5.9), (I-9) + (5.16), (I-9) + (5.23), (I-9) + (5.25), (I-9) + (5.26), (I-9) + (5.29), (I-9) + (5.30), (I-9) + (7.7), (I-9) + (9.2), (I-9) + (9.4), (I-9) + (9.5), (I-9) + (10.9), (I-9) + (10.10), (I-9) + (12.9), (I-9) + (12.10), (I-9) + (14.4), (I-9) + (15.9), (I-9) + (15.24), (I-9) + (15.25), (I-9) + (15.26), (I-9) + (15.41), (I-9) + (15.42), (I-9) + (15.54), (I-9) + (15.55), (I-9) + (15.56), (I-9) + (15.60), (I-9) + (15.90).

In a preferred embodiment this invention is directed to mixtures comprising the compound (I-10) as compound of formula (I) and one component (B), in particular the mixtures (I-10) + (1.1), (I-10) + (1.2), (I-10) + (1.3), (I-10) + (1.4), (I-10) + (1.5), (I-10) + (1.6), (I-10) + (1.7), (I-10) + (1.8), (I-10) + (1.9), (I-10) + (1.10), (I-10) + (1.11), (I-10) + (1.12), (I-10) + (1.13), (I-10) + (1.14), (I-10) + (1.15), (I-10) + (1.16), (I-10) + (1.17), (I-10) + (1.18), (I-10) + (1.19), (I-10) + (1.20), (I-10) + (1.21), (I-10) + (1.22), (I-10) + (1.23), (I-10) + (1.24), (I-10) + (1.25), (I-10) + (1.26), (I-10) + (1.27), (I-10) + (1.28), (I-10) + (1.29), (I-10) + (1.30), (I-10) + (1.31), (I-10) + (1.32), (I-10) + (1.33), (I-10) + (1.34), (I-10) + (1.35), (I-10) + (1.36), (I-10) + (1.37), (I-10) + (1.38), (I-10) + (1.39), (I-10) + (1.40), (I-10) + (1.41), (I-10) + (1.42), (I-10) + (1.43), (I-10) + (1.44), (I-10) + (1.45), (I-10) + (1.46), (I-10) + (1.47), (I-10) + (1.48), (I-10) + (1.49), (I-10) + (1.50), (I-10) + (1.51), (I-10) + (1.52), (I-10) + (1.53), (I-10) + (1.54), (I-10) + (1.55), (I-10) + (1.56), (I-10) + (1.57), (I-10) + (1.58), (I-10) + (1.59), (I-10) + (1.60), (I-10) + (1.61), (I-10) + (1.62), (I-10) + (1.63), (I-10) + (1.64), (I-10) + (2.1), (I-10) + (2.2), (I-10) + (2.3), (I-10) + (2.4), (I-10) + (2.5), (I-10) + (2.6), (I-10) + (2.7), (I-10) + (2.8), (I-10) + (2.9), (I-10) + (2.10), (I-10) + (2.11), (I-10) + (2.12), (I-10) + (2.13), (I-10) + (2.14), (I-10) + (2.15), (I-10) + (2.16), (I-10) + (2.17), (I-10) + (2.18), (I-10) + (2.19), (I-10) + (2.20), (I-10) + (2.21), (I-10) + (2.22), (I-10) + (2.23), (I-10) + (2.24), (I-10) + (2.25), (I-10) + (2.26), (I-10) + (2.27), (I-10) + (2.28), (I-10) + (2.29), (I-10) + (3.1), (I-10) + (3.2), (I-10) + (3.3), (I-10) + (3.4), (I-10) + (3.5), (I-10) + (3.6), (I-10) + (3.7), (I-10) + (3.8), (I-10) + (3.9), (I-10) + (3.10), (I-10) + (3.11), (I-10) + (3.12), (I-10) + (3.13), (I-10) + (3.14), (I-10) + (3.15), (I-10) + (3.16), (I-10) + (3.17), (I-10) + (3.18), (I-10) + (3.19), (I-10) + (3.20), (I-10) + (3.21), (I-10) + (3.22), (I-10) + (3.23), (I-10) + (3.24), (I-10) + (3.25), (I-10) + (3.26), (I-10) + (3.27), (I-10) + (3.28), (I-10) + (3.29), (I-10) + (3.30), (I-10) + (3.31), (I-10) + (3.32), (I-10) + (3.33), (I-10) + (4.1), (I-10) + (4.2), (I-10) + (4.3), (I-10) + (4.4), (I-10) + (4.5), (I-10) + (4.6), (I-10) + (4.7), (I-10) + (4.8), (I-10) + (4.9), (I-10) + (4.10), (I-10) + (4.11), (I-10) + (4.12), (I-10) + (4.13), (I-10) + (4.14), (I-10) + (5.1), (I-10) + (5.2), (I-10) + (5.3), (I-10) + (5.4), (I-10) + (5.5), (I-10) + (5.6), (I-10) + (5.7), (I-10) + (5.8), (I-10) + (5.9), (I-10) + (5.10), (I-10) + (5.11), (I-10) + (5.12), (I-10) + (5.13), (I-10) + (5.14), (I-10) + (5.15), (I-10) + (5.16), (I-10) + (5.17), (I-10) + (5.18), (I-10) + (5.19), (I-10) + (5.20), (I-10) + (5.21), (I-10) + (5.22), (I-10) + (5.23), (I-10) + (5.24), (I-10) + (5.25), (I-10) + (5.26), (I-10) + (5.27), (I-10) + (5.28), (I-10) + (5.29), (I-10) + (5.30), (I-

10) + (5.31), (I-10) + (5.32), (I-10) + (5.33), (I-10) + (5.34), (I-10) + (6.1), (I-10) + (6.2), (I-10) + (6.3), (I-10) + (6.4), (I-10) + (7.1), (I-10) + (7.2), (I-10) + (7.3), (I-10) + (7.4), (I-10) + (7.5), (I-10) + (7.6), (I-10) + (7.7), (I-10) + (7.8), (I-10) + (8.1), (I-10) + (8.2), (I-10) + (8.3), (I-10) + (8.4), (I-10) + (9.1), (I-10) + (9.2), (I-10) + (9.3), (I-10) + (9.4), (I-10) + (9.5), (I-10) + (9.6), (I-10) + (9.7), (I-10) + (9.8), (I-10) + (9.9), (I-10) + (10.1), (I-10) + (10.2), (I-10) + (10.3), (I-10) + (10.4), (I-10) + (10.5), (I-10) + (10.6), (I-10) + (10.7), (I-10) + (10.8), (I-10) + (10.9), (I-10) + (10.10), (I-10) + (10.11), (I-10) + (10.12), (I-10) + (10.13), (I-10) + (10.14), (I-10) + (10.15), (I-10) + (11.1), (I-10) + (11.2), (I-10) + (11.3), (I-10) + (11.4), (I-10) + (11.5), (I-10) + (11.6), (I-10) + (11.7), (I-10) + (12.1), (I-10) + (12.2), (I-10) + (12.3), (I-10) + (12.4), (I-10) + (12.5), (I-10) + (12.6), (I-10) + (12.7), (I-10) + (12.8), (I-10) + (12.9), (I-10) + (12.10), (I-10) + (12.11), (I-10) + (12.12), (I-10) + (12.13), (I-10) + (13.1), (I-10) + (13.2), (I-10) + (13.3), (I-10) + (13.4), (I-10) + (13.5), (I-10) + (13.6), (I-10) + (13.7), (I-10) + (14.1), (I-10) + (14.2), (I-10) + (14.3), (I-10) + (14.4), (I-10) + (14.5), (I-10) + (15.1), (I-10) + (15.2), (I-10) + (15.3), (I-10) + (15.4), (I-10) + (15.5), (I-10) + (15.6), (I-10) + (15.7), (I-10) + (15.8), (I-10) + (15.9), (I-10) + (15.10), (I-10) + (15.11), (I-10) + (15.12), (I-10) + (15.13), (I-10) + (15.14), (I-10) + (15.15), (I-10) + (15.16), (I-10) + (15.17), (I-10) + (15.18), (I-10) + (15.19), (I-10) + (15.20), (I-10) + (15.21), (I-10) + (15.22), (I-10) + (15.23), (I-10) + (15.24), (I-10) + (15.25), (I-10) + (15.26), (I-10) + (15.27), (I-10) + (15.28), (I-10) + (15.29), (I-10) + (15.30), (I-10) + (15.31), (I-10) + (15.32), (I-10) + (15.33), (I-10) + (15.34), (I-10) + (15.35), (I-10) + (15.36), (I-10) + (15.37), (I-10) + (15.38), (I-10) + (15.39), (I-10) + (15.41), (I-10) + (15.42), (I-10) + (15.43), (I-10) + (15.44), (I-10) + (15.45), (I-10) + (15.46), (I-10) + (15.47), (I-10) + (15.48), (I-10) + (15.49), (I-10) + (15.50), (I-10) + (15.51), (I-10) + (15.52), (I-10) + (15.53), (I-10) + (15.54), (I-10) + (15.55), (I-10) + (15.56), (I-10) + (15.57), (I-10) + (15.58), (I-10) + (15.59), (I-10) + (15.60), (I-10) + (15.61), (I-10) + (15.62), (I-10) + (15.63), (I-10) + (15.64), (I-10) + (15.65), (I-10) + (15.66), (I-10) + (15.67), (I-10) + (15.68), (I-10) + (15.69), (I-10) + (15.70), (I-10) + (15.71), (I-10) + (15.72), (I-10) + (15.73), (I-10) + (15.74), (I-10) + (15.75), (I-10) + (15.76), (I-10) + (15.77), (I-10) + (15.78), (I-10) + (15.79), (I-10) + (15.80), (I-10) + (15.81), (I-10) + (15.82), (I-10) + (15.83), (I-10) + (15.84), (I-10) + (15.85), (I-10) + (15.86), (I-10) + (15.87), (I-10) + (15.88), (I-10) + (15.89), (I-10) + (15.90), (I-10) + (15.91), (I-10) + (15.92), (I-10) + (15.93), (I-10) + (15.94).

In a further particularly preferred embodiment this invention is directed to mixtures comprising the compound (I-10) as compound of formula (I) and one component (B), in particular the mixtures (I-10) + (2.1), (I-10) + (2.2), (I-10) + (2.6), (I-10) + (2.8), (I-10) + (2.11), (I-10) + (2.12), (I-10) + (2.13), (I-10) + (2.14), (I-10) + (2.15), (I-10) + (2.16), (I-10) + (2.17), (I-10) + (2.29), (I-10) + (3.1), (I-10) + (3.2), (I-10) + (3.3), (I-10) + (3.4), (I-10) + (3.9), (I-10) + (3.10), (I-10) + (3.12), (I-10) + (3.16), (I-10) + (3.17), (I-10) + (3.22), (I-10) + (4.6), (I-10) + (5.1), (I-10) + (5.4), (I-10) + (5.5), (I-10) + (5.7), (I-10) + (5.8), (I-10) + (5.9), (I-10) + (5.16), (I-10) + (5.23), (I-10) + (5.25), (I-10) + (5.26), (I-10) + (5.29), (I-10) + (5.30), (I-10) + (7.7), (I-10) + (9.2), (I-10) + (9.4), (I-10) + (9.5), (I-10) + (10.9), (I-10) + (10.10), (I-10) + (12.9), (I-10) + (12.10), (I-

10) + (14.4), (I-10) + (15.9), (I-10) + (15.24), (I-10) + (15.25), (I-10) + (15.26), (I-10) + (15.41), (I-10) + (15.42), (I-10) + (15.54), (I-10) + (15.55), (I-10) + (15.56), (I-10) + (15.60), (I-10) + (15.90).

If the active compounds in the active compound combinations according to the invention are present in certain weight ratios, the synergistic effect is particularly pronounced. However, the weight ratios of the active compounds in the active compound combinations can be varied within a relatively wide range.

In the combinations according to the invention the compounds (A) and (B) are present in a synergistically effective weight ratio of A:B in a range of 100:1 to 1:100, preferably in a weight ratio of 50:1 to 1:50, most preferably in a weight ratio of 20:1 to 1:20. Further ratios of A:B which can be used according to the present invention with increasing preference in the order given are: 95:1 to 1:95, 90:1 to 1:90, 85:1 to 1:85, 80:1 to 1:80, 75:1 to 1:75, 70:1 to 1:70, 65:1 to 1:65, 60:1 to 1:60, 55:1 to 1:55, 45:1 to 1:45, 40:1 to 1:40, 35:1 to 1:35, 30:1 to 1:30, 25:1 to 1:25, 15:1 to 1:15, 10:1 to 1:10, 5:1 to 1:5, 4:1 to 1:4, 3:1 to 1:3, 2:1 to 1:2.

Where a compound (A) or a compound (B) can be present as mixtures of various possible isomeric forms, in particular of stereoisomers, such as, for example, E and Z, threo and erythro, and also optical isomers, and, if appropriate, also of tautomers. What is claimed are both the E and the Z isomers and the threo and erythro and also the optical isomers (R and S), any mixtures of these isomers, and also the possible tautomeric forms.

Compounds (A) or compounds (B) having at least one basic centre are capable of forming, for example, acid addition salts, e.g. with strong inorganic acids, such as mineral acids, e.g. perchloric acid, sulfuric acid, nitric acid, nitrous acid, a phosphoric acid or a hydrohalic acid, with strong organic carboxylic acids, such as unsubstituted substituted, e.g. halo-substituted, C_1-C_4 alkanecarboxylic acids, e.g. acetic acid, saturated or unsaturated dicarboxylic acids, e.g. oxalic, malonic, succinic, maleic, fumaric and phthalic acid, hydroxycarboxylic acids, e.g. ascorbic, lactic, malic, tartaric and citric acid, or benzoic acid, or with organic sulfonic acids, such as unsubstituted or substituted, e.g. halo-substituted, C_1-C_4alkane- or arylsulfonic acids, e.g. methane- or p-toluene-sulfonic acid. Compounds (A) or compounds (B) having at least one acid group are capable of forming, for example, salts with bases, e.g. metal salts, such as alkali metal or alkaline earth metal salts, e.g. sodium, potassium or magnesium salts, or salts with ammonia or an organic amine, such as morpholine, piperidine, pyrrolidine, a mono-, di- or tri-lower alkylamine, e.g. ethyl-, diethyl-, triethyl- or dimethyl-propyl-amine, or a mono-, di- or tri-hydroxy-lower alkylamine, e.g. mono-, di- or tri-ethanolamine. In addition, corresponding internal salts may optionally be formed. In the context of the invention, preference is given to agrochemically advantageous salts. In view of the close relationship between the compounds (A) or the compounds (B) in free form and in the form of their salts, hereinabove and herein below any reference to the free compounds (A) or free compounds (B) or to their salts should be understood as including also the corresponding salts or the free compounds (A) or free compounds (B), respectively, where appropriate and expedient. The equivalent also applies to tautomers of compounds (A) or compounds (B) and to their salts.

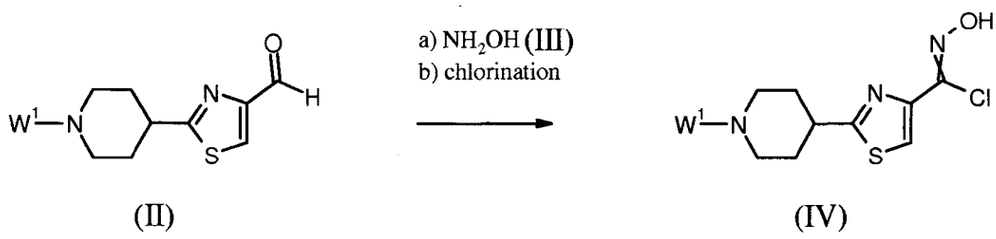
According to the invention the expression "combination" stands for the various combinations of compounds (A) and (B), for example in a single "ready-mix" form, in a combined spray mixture composed from separate formulations of the single active compounds, such as a "tank-mix", and in a combined use of the single active ingredients when applied in a sequential manner, i.e. one after the other with a reasonably short period, such as a few hours or days. Preferably the order of applying the compounds (A) and (B) is not essential for working the present invention.

Illustration of the processes and intermediates

The bis(difluoromethyl)pyrazole derivatives of the formula (I) can be prepared in different ways. First of all, the possible processes are shown schematically hereinafter. Unless stated otherwise, the radicals stated are each as defined above.

Process A

Scheme 1: Process A



(II) (IV)

W^1 is acetyl, C_1-C_4-alkoxycarbonyl, benzyl, benzyloxycarbonyl or [3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]acetyl

One means of preparing the intermediate **(IV)** from compound **(II)** is shown in Scheme 1 (Process A).

A compound of the general formula **(IV)** is obtained by condensation of an aldehyde of the formula **(II)** with hydroxylamine **(III)** and subsequent chlorination (see, for example, WO 05/0040159, WO 08/013622 and *Synthesis* **1987**, 11, 998-1001).

In process A, aldehyde **(II)** and hydroxylamine **(VII)** are first reacted (Scheme 1, step (a)). The corresponding oxime is subsequently chlorinated in the presence of a suitable chlorinating agent. Preferred chlorinating reagents are N-chlorosuccinimide, HClO and chlorine. After step (a) of process A, the reaction mixture can be worked up by customary methods or converted further directly in step (b).

The aldehyds **(II)** are commercially available (for W^1 = t-butoxycarbonyl: Maybridge) or can be prepared from commercially available precursors by methods described in the literature. For example, the aldehyds **(II)** can be prepared starting from the corresponding methyl- or ethylester by reduction with lithium aluminium hydrid in tetrahydrofurane at 0°C followed by an oxidation of the produced alkohols with Dess-Martin periodinane reagent at room temperature in dichloromethane (see e.g. WO 07/147336 und WO

07/039177 for the reduction with lithium aluminium hydrid and *J. Am. Chem. Soc.* **1978**, 100, 300-301; **1979**, 101, 5294-5299; **1991**, 113, 7277-7287 for the oxidation with Dess-Martin periodinane reagent).

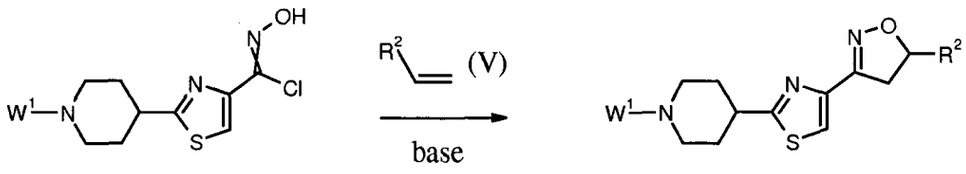
Process A is preferably performed using one or more diluents. In step (a) of process A according to the invention, preference is given to using protic solvents, for example ethanol, as the solvent. After the formation of the corresponding oxime from compound (**II**), the reaction mixture is diluted in step (b) with a further solvent, for example tetrahydrofuran, and then admixed with aqueous sodium hypochlorite. The chlorination can likewise be effected with the aid of N-chlorosuccinimide in DMF.

In the performance of process A, the reaction temperatures can be varied within a relatively wide range. In general, the temperatures employed are from -10°C to +150°C, preferably temperatures from 0°C to +100°C, most preferably reflux temperature of the solvent in step (a), and 0°C to 30°C in step (b).

To perform process A, generally 1 to 2 mol, preferably 1 mol, of hydroxylamine (**III**) and generally 1 to 5 mol, preferably 1 mol, of a chlorinating reagent are used per mole of compound of the formula (**II**). The reaction time is 1 to 48 hours. The workup is effected by customary methods. If necessary, the compounds are purified by recrystallization, distillation or chromatography, or can optionally also be used in the next step without prior purification.

Process B

Scheme 2: Process B



(IV) (VI)

W^1 is acetyl, C_1-C_4-alkoxycarbonyl, benzyl, benzyloxycarbonyl or [3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]acetyl

R2 represents phenyl, which is at least substituted with one prop-2-yn-1-yloxy or one hydroxy group and optionally be additionally substituted by one, two or three substituents selected from the group consisting of methyl, methoxy, fluoro or chloro

One means of preparing the intermediate (**VI**) from compound (**IV**) is shown in Scheme 2 (Process B).

A compound of the general formula (**VI**) is obtained from an alkene of the general formula (**IV**) and compound (**V**) by a cycloaddition reaction (see, for example, WO08/013622, and *Synthesis*, **1987**, 11, 998-1001).

The alkenes (**V**) are commercially available or can be prepared from commercially available precursors by methods described in the literature (for example from ketones or aldehydes by a Wittig or Horner-

Wadsworth-Emmons olefination: *Chem. Rev.* **1989**, 89, 863-927 and Julia olefination: *Tetrahedron Lett.*, **1973**, 14, 4833-4836; Peterson olefination: *J. Org. Chem.* **1968**, *33*, 780).

Process B is performed in the presence of a suitable base. Preferred bases are tertiary amines (e.g. triethylamine), and alkali metal or alkaline earth metal carbonates, hydrogencarbonates and phosphates.

Process B is preferably performed using one or more diluents. In the performance of process B, inert organic solvents are a preferred option (for example toluene and hexane). Water is likewise a possible solvent. Alternatively, process B can be performed in an excess of the alkene (**V**).

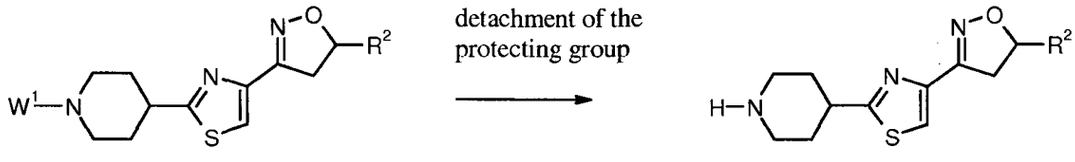
Typically, a suitable base and the olefin (**V**) are initially charged and compound (**IV**) is added. Alternatively, compounds (**IV**) and (**V**) are initially charged and a suitable base is added.

In the performance of process B, the reaction temperatures can be varied within a relatively wide range. In general, the temperatures employed are from -120°C to +150°C, preferably temperatures of -10°C to +100°C, most preferably 0°C to 30°C.

To perform process B, generally 0.5 to 5 mol, preferably 1 mol, of the alkene (**V**) are used per mole of compound of the formula (**IV**). The reaction time is 1 to 48 hours. The workup is effected by customary methods. If necessary, the compounds are purified by recrystallization, distillation or chromatography, or can optionally also be used in the next step without prior purification.

Process C

Scheme 3: Process C



(VI) (VII)

W^1 is acetyl, C_1-C_4-alkoxycarbonyl, benzyl or benzyloxycarbonyl

R2 represents phenyl, which is at least substituted with one prop-2-yn-1-yloxy or one hydroxy group and optionally be additionally substituted by one, two or three substituents selected from the group consisting of methyl, methoxy, fluoro or chloro

One means of preparing compounds of the formula (**VII**) from corresponding compounds (**VI**) is shown in Scheme 3.

A compound of the formula (**VI**) is converted to a compound of the formula (**VII**) by suitable methods for removing protecting groups, which are described in the literature ("*Protective Groups in Organic Synthesis*"; Third Edition; 1999; 494-653, and literature cited therein).

tert-Butoxycarbonyl and benzyloxycarbonyl protecting groups can be removed in an acidic medium (for example with hydrochloric acid or trifluoroacetic acid). Acetyl protecting groups can be removed under basic conditions (for example with potassium carbonate or caesium carbonate). Benzylic protecting groups can be removed by hydrogenolysis with hydrogen in the presence of a catalyst (for example palladium on activated carbon).

Useful solvents are all customary solvents which are inert under the reaction conditions, for example alcohols (e.g. methanol, ethanol, propanol), cyclic and acyclic ethers (e.g. diethyl ether, tetrahydrofuran, dioxane), aromatic hydrocarbons (e.g. benzene, toluene, xylene), halogenated hydrocarbons (e.g. dichloromethane, chloroform, carbon tetrachloride), halogenated aromatic hydrocarbons (e.g. chlorobenzene, dichlorobenzene), nitriles (e.g. acetonitrile), carboxylic esters (e.g. ethyl acetate), amides (e.g. N,N-dimethylformamide, N,N-dimethylacetamide), dimethyl sulphoxide, 1,3-dimethyl-2-imidazolinone, water and acetic acid, or the reaction can be performed in mixtures of two or more of these solvents.

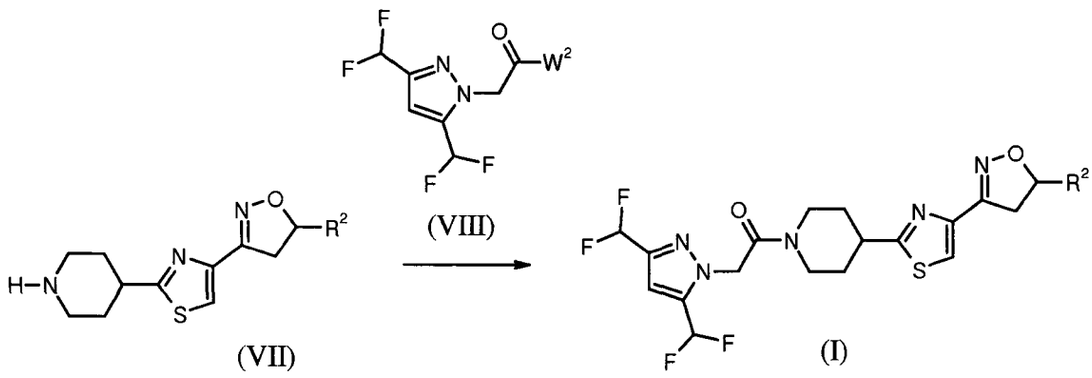
Acids which can be used for this reaction of deprotection of t-butoxycarbonyl and benzyloxycarbonyl groups are, for example, trifluoroacetic acid, hydrochloric acid or other acids as described in the literature (for example "*Protective Groups in Organic Synthesis*"; Third Edition; 1999; pp. 494-653).

The reaction is normally performed at temperatures of 0°C to +150°C and preferably at room temperature, but it can also be performed at reflux temperature of the reaction mixture. The reaction time varies as a function of the scale of the reaction and the reaction temperature, but is generally between half an hour and 72 hours.

After the reaction has ended, the compounds (**VII**) are separated from the reaction mixture by one of the customary separation techniques. If necessary, the compounds are purified by recrystallization, distillation or chromatography, or can, if desired, also be used in the next step without prior purification. It is also possible to isolate the compound of the general formula (**VII**) as a salt, for example as a salt of hydrochloric acid or of trifluoroacetic acid.

Process D

Scheme 4: Process D



W^2 is chlorine or OH

R2 represents phenyl, which is at least substituted with one prop-2-yn-1-yloxy or one hydroxy group and optionally be additionally substituted by one, two or three substituents selected from the group consisting of methyl, methoxy, fluoro or chloro

One means of preparing compounds of the formula (**I**) from corresponding compounds (**VII**) is shown in Scheme 4.

A compound with the general formula (**I**) can be synthesized analogously to methods described in the literature (see, for example WO 07/147336), by a coupling reaction of a compound with the corresponding general formula (**VII**) with a substrate of the general formula (**VIIIa**) where W^{2a} = chlorine, optionally in the presence of an acid scavenger/base.

Compounds (**VIIIa**) (W^{2a} = chlorine) or (**VIIIb**) (W^{2b} = OH) are either commercially available or can be prepared by processes described in the literature (see, for example, WO 08/013622 and WO 08/013925). In addition, a substrate with the general formula (**VIIIa**) where W^{2a} = chlorine can be prepared from the corresponding acid (W^{2b} = OH) by chlorination using processes known from the literature (e.g. *Tetrahedron* **2005**, 61, 10827-10852, and literature cited therein).

The solvents used may be all customary solvents which are inert under the reaction conditions, for example cyclic and acyclic ethers (e.g. diethyl ether, tetrahydrofuran, dioxane), aromatic hydrocarbons (e.g. benzene, toluene, xylene), halogenated hydrocarbons (e.g. dichloromethane, chloroform, carbon tetrachloride), halogenated aromatic hydrocarbons (e.g. chlorobenzene, dichlorobenzene) and nitriles (e.g. acetonitrile), or the reaction can be performed in mixtures of two or more of these solvents. The preferred solvents are tetrahydrofuran and dichloromethane.

At least one equivalent of an acid scavenger/a base (for example Hünig's base, triethylamine or commercially available polymeric acid scavengers) is used, in relation to the starting material of the general

formula (**VII**). If the starting material is a salt, at least two equivalents of the acid scavenger are required.

The reaction is normally performed at temperatures of 0°C to 100°C and preferably at 20°C to 30°C, but it can also be performed at reflux temperature of the reaction mixture. The reaction time varies as a function of the scale of the reaction and the reaction temperature, but is generally between a few minutes and 48 hours.

After the reaction has ended, the compounds (**I**) are separated from the reaction mixture by one of the customary separation techniques. If necessary, the compounds are purified by recrystallization, distillation or chromatography, or can optionally also be used in the next step without prior purification.

Alternatively, a compound of the formula (**I**) can also be synthesized from the corresponding compound of the formula (**VII**) with a substrate of the formula (**VIIIb**) where W^{2b} = OH in the presence of a coupling reagent, analogously to methods described in the literature (e.g. *Tetrahedron* **2005**, 61, 10827-10852, and references cited therein).

Suitable coupling reagents are, for example, peptide coupling reagents (for example N-(3-dimethylaminopropyl)-N'-ethylcarbodiimide mixed with 4-dimethylaminopyridine, N-(3-dimethylaminopropyl)-N'-ethylcarbodiimide mixed with 1-hydroxybenzotriazole, bromotripyrrolidinophosphonium hexafluorophosphate, O-(7-azabenzotriazol-1-yl)-N,N,N',N'-tetramethyluronium hexafluorophosphate, etc.).

If appropriate, a base, for example triethylamine or Hünig's base, can be used in the reaction.

The hydroxy substituents in R^2 can be modified by reaction methods which are common knowledge to those skilled in the art at all stages of the synthesis in which they occur. For example, OH functionalities can be alkylated by known methods with suitable halides or sulphates (see, for example, J. March: Advanced Organic Chemistry – Reactions, Mechanisms, and Structures, 4th Ed. (1992), Wiley, New York, pages 388-390, 406-407, 411-415). Examples of such reactions can be found in the synthesis part of this application.

The solvents used may be all customary solvents which are inert under the reaction conditions, for example alcohols (e.g. methanol, ethanol, propanol), cyclic and acyclic ethers (e.g. diethyl ether, tetrahydrofuran, dioxane), aromatic hydrocarbons (e.g. benzene, toluene, xylene), halogenated hydrocarbons (e.g. dichloromethane, chloroform, carbon tetrachloride), halogenated aromatic hydrocarbons (e.g. chlorobenzene, dichlorobenzene), nitriles (e.g. acetonitrile) and amides (e.g. N,N-dimethylformamide, N,N-dimethylacetamide), or the reaction can be performed in mixtures of two or more of these solvents. The preferred solvent is dichloromethane.

The reaction is normally performed at temperatures of 0°C – 100°C and preferably at 0°C – 30°C, but it can also be carried out at reflux temperature of the reaction mixture. The reaction time varies as a function of the scale of the reaction and the reaction temperature, but is generally between a few minutes and 48 hours.

After the reaction has ended, the compounds (I) are separated from the reaction mixture by one of the customary separation techniques. If necessary, the compounds are purified by recrystallization, distillation or chromatography, or can optionally also be used in the next step without prior purification.

The present invention furthermore relates to compositions for combating/controlling undesirable microorganisms comprising the active compound combinations according to the invention. Preferably, the compositions are fungicidal compositions comprising agriculturally suitable auxiliaries, solvents, carriers, surfactants or extenders.

Furthermore the invention relates to a method of combating undesirable microorganisms, characterized in that the active compound combinations according to the invention are applied to the phytopathogenic fungi and/or their habitat.

According to the invention, carrier is to be understood as meaning a natural or synthetic, organic or inorganic substance which is mixed or combined with the active compounds for better applicability, in particular for application to plants or plant parts or seeds. The carrier, which may be solid or liquid, is generally inert and should be suitable for use in agriculture.

Suitable solid or liquid carriers are: for example ammonium salts and natural ground minerals, such as kaolins, clays, talc, chalk, quartz, attapulgite, montmorillonite or diatomaceous earth, and ground synthetic minerals, such as finely divided silica, alumina and natural or synthetic silicates, resins, waxes, solid fertilizers, water, alcohols, especially butanol, organic solvents, mineral oils and vegetable oils, and also derivatives thereof. It is also possible to use mixtures of such carriers. Solid carriers suitable for granules are: for example crushed and fractionated natural minerals, such as calcite, marble, pumice, sepiolite, dolomite, and also synthetic granules of inorganic and organic meals and also granules of organic material, such as sawdust, coconut shells, maize cobs and tobacco stalks.

Suitable liquefied gaseous extenders or carriers are liquids which are gaseous at ambient temperature and under atmospheric pressure, for example aerosol propellants, such as butane, propane, nitrogen and carbon dioxide.

Tackifiers, such as carboxymethylcellulose and natural and synthetic polymers in the form of powders, granules and latices, such as gum arabic, polyvinyl alcohol, polyvinyl acetate, or else natural phospholipids, such as cephalins and lecithins and synthetic phospholipids can be used in the formulations. Other possible additives are mineral and vegetable oils and waxes, optionally modified.

If the extender used is water, it is also possible for example, to use organic solvents as auxiliary solvents. Suitable liquid solvents are essentially: aromatic compounds, such as xylene, toluene or alkylnaphthalenes, chlorinated aromatic compounds or chlorinated aliphatic hydrocarbons, such as chlorobenzenes, chloroethylenes or methylene chloride, aliphatic hydrocarbons, such as cyclohexane or paraffins, for example mineral oil fractions, mineral and vegetable oils, alcohols, such as butanol or glycol, and also ethers and esters thereof, ketones, such as acetone, methyl ethyl ketone, methyl isobutyl ketone or cyclohexanone, strongly polar solvents, such as dimethylformamide and dimethyl sulphoxide, and also water.

The compositions according to the invention may comprise additional further components, such as, for example, surfactants. Suitable surfactants are emulsifiers, dispersants or wetting agents having ionic or non-ionic properties, or mixtures of these surfactants. Examples of these are salts of polyacrylic acid, salts of lignosulphonic acid, salts of phenolsulphonic acid or naphthalenesulphonic acid, polycondensates of ethylene oxide with fatty alcohols or with fatty acids or with fatty amines, substituted phenols (preferably alkylphenols or arylphenols), salts of sulphosuccinic esters, taurine derivatives (preferably alkyl taurates), phosphoric esters of polyethoxylated alcohols or phenols, fatty esters of polyols, and derivatives of the compounds containing sulphates, sulphonates and phosphates. The presence of a surfactant is required if one of the active compounds and/or one of the inert carriers is insoluble in water and when the application takes place in water. The proportion of surfactants is between 5 and 40 per cent by weight of the composition according to the invention.

It is possible to use colorants such as inorganic pigments, for example iron oxide, titanium oxide, Prussian blue, and organic dyes, such as alizarin dyes, azo dyes and metal phthalocyanine dyes, and trace nutrients, such as salts of iron, manganese, boron, copper, cobalt, molybdenum and zinc.

If appropriate, other additional components may also be present, for example protective colloids, binders, adhesives, thickeners, thixotropic substances, penetrants, stabilizers, sequestering agents, complex formers. In general, the active compounds can be combined with any solid or liquid additive customarily used for formulation purposes.

In general, the compositions according to the invention comprise between 0.05 and 99 per cent by weight, 0.01 and 98 per cent by weight, preferable between 0.1 and 95 per cent by weight, particularly preferred between 0.5 and 90 per cent by weight of the active compound combination according to the invention, very particularly preferable between 10 and 70 per cent by weight.

The active compound combinations or compositions according to the invention can be used as such or, depending on their respective physical and/or chemical properties, in the form of their formulations or the use forms prepared therefrom, such as aerosols, capsule suspensions, cold-fogging concentrates, warm-fogging concentrates, encapsulated granules, fine granules, flowable concentrates for the treatment of seed, ready-to-use solutions, dustable powders, emulsifiable concentrates, oil-in-water emulsions, water-in-oil emulsions,

macrogranules, microgranules, oil-dispersible powders, oil-miscible flowable concentrates, oil-miscible liquids, foams, pastes, pesticide-coated seed, suspension concentrates, suspoemulsion concentrates, soluble concentrates, suspensions, wettable powders, soluble powders, dusts and granules, water-soluble granules or tablets, water-soluble powders for the treatment of seed, wettable powders, natural products and synthetic substances impregnated with active compound, and also microencapsulations in polymeric substances and in coating materials for seed, and also ULV cold-fogging and warm-fogging formulations.

The formulations mentioned can be prepared in a manner known per se, for example by mixing the active compounds or the active compound combinations with at least one additive. Suitable additives are all customary formulation auxiliaries, such as, for example, organic solvents, extenders, solvents or diluents, solid carriers and fillers, surfactants (such as adjuvants, emulsifiers, dispersants, protective colloids, wetting agents and tackifiers), dispersants and/or binders or fixatives, preservatives, dyes and pigments, defoamers, inorganic and organic thickeners, water repellents, if appropriate siccatives and UV stabilizers, gibberellins and also water and further processing auxiliaries. Depending on the formulation type to be prepared in each case, further processing steps such as, for example, wet grinding, dry grinding or granulation may be required.

The compositions according to the invention do not only comprise ready-to-use compositions which can be applied with suitable apparatus to the plant or the seed, but also commercial concentrates which have to be diluted with water prior to use.

The active compound combinations according to the invention can be present in (commercial) formulations and in the use forms prepared from these formulations as a mixture with other (known) active compounds, such as insecticides, attractants, sterilants, bactericides, acaricides, nematicides, fungicides, growth regulators, herbicides, fertilizers, safeners and Semiochemicals.

The treatment according to the invention of the plants and plant parts with the active compounds or compositions is carried out directly or by action on their surroundings, habitat or storage space using customary treatment methods, for example by dipping, spraying, atomizing, irrigating, evaporating, dusting, fogging, broadcasting, foaming, painting, spreading-on, watering (drenching), drip irrigating and, in the case of propagation material, in particular in the case of seeds, furthermore as a powder for dry seed treatment, a solution for seed treatment, a water-soluble powder for slurry treatment, by incrusting, by coating with one or more layers, etc. It is furthermore possible to apply the active compounds by the ultra-low volume method, or to inject the active compound preparation or the active compound itself into the soil.

The invention furthermore comprises a method for treating seed. The invention furthermore relates to seed treated according to one of the methods described in the preceding paragraph.

The active compounds or compositions according to the invention are especially suitable for treating seed. A large part of the damage to crop plants caused by harmful organisms is triggered by an infection of the

seed during storage or after sowing as well as during and after germination of the plant. This phase is particularly critical since the roots and shoots of the growing plant are particularly sensitive, and even small damage may result in the death of the plant. Accordingly, there is great interest in protecting the seed and the germinating plant by using appropriate compositions.

The control of phytopathogenic fungi by treating the seed of plants has been known for a long time and is the subject of continuous improvements. However, the treatment of seed entails a series of problems which cannot always be solved in a satisfactory manner. Thus, it is desirable to develop methods for protecting the seed and the germinating plant which dispense with the additional application of crop protection agents after sowing or after the emergence of the plants or which at least considerably reduce additional application. It is furthermore desirable to optimize the amount of active compound employed in such a way as to provide maximum protection for the seed and the germinating plant from attack by phytopathogenic fungi, but without damaging the plant itself by the active compound employed. In particular, methods for the treatment of seed should also take into consideration the intrinsic fungicidal properties of transgenic plants in order to achieve optimum protection of the seed and the germinating plant with a minimum of crop protection agents being employed.

Accordingly, the present invention also relates in particular to a method for protecting seed and germinating plants against attack by phytopathogenic fungi by treating the seed with a composition according to the invention. The invention also relates to the use of the compositions according to the invention for treating seed for protecting the seed and the germinating plant against phytopathogenic fungi. Furthermore, the invention relates to seed treated with a composition according to the invention for protection against phytopathogenic fungi.

The control of phytopathogenic fungi which damage plants post-emergence is carried out primarily by treating the soil and the above-ground parts of plants with crop protection compositions. Owing to the concerns regarding a possible impact of the crop protection composition on the environment and the health of humans and animals, there are efforts to reduce the amount of active compounds applied.

One of the advantages of the present invention is that, because of the particular systemic properties of the compositions according to the invention, treatment of the seed with these compositions not only protects the seed itself, but also the resulting plants after emergence, from phytopathogenic fungi. In this manner, the immediate treatment of the crop at the time of sowing or shortly thereafter can be dispensed with.

It is also considered to be advantageous that the mixtures according to the invention can be used in particular also for transgenic seed where the plant growing from this seed is capable of expressing a protein which acts against pests. By treating such seed with the active compound combinations or compositions according to the invention, even by the expression of the, for example, insecticidal protein, certain pests may be

controlled. Surprisingly, a further synergistic effect may be observed here, which additionally increases the effectiveness of the protection against attack by pests.

The compositions according to the invention are suitable for protecting seed of any plant variety employed in agriculture, in the greenhouse, in forests or in horticulture or viticulture. In particular, this takes the form of seed of cereals (such as wheat, barley, rye, triticale, millet, oats), maize (corn), cotton, soya bean, rice, potatoes, sunflowers, beans, coffee, beets (e.g. sugar beets and fodder beets), peanuts, oilseed rape, poppies, olives, coconuts, cacao, sugar cane, tobacco, vegetables (such as tomatoes, cucumbers, onions and lettuce), lawn and ornamental plants (also see below). The treatment of seeds of cereals (such as wheat, barley, rye, triticale, and oats), maize (corn) and rice is of particular importance.

As also described further below, the treatment of transgenic seed with the active compound combinations or compositions according to the invention is of particular importance. This refers to the seed of plants containing at least one heterologous gene which allows the expression of a polypeptide or protein having insecticidal properties. The heterologous gene in transgenic seed can originate, for example, from microorganisms of the species Bacillus, Rhizobium, Pseudomonas, Serratia, Trichoderma, Clavibacter, Glomus or Gliocladium. Preferably, this heterologous gene is from Bacillus sp., the gene product having activity against the European corn borer and/or the Western corn rootworm. Particularly preferably, the heterologous gene originates from Bacillus thuringiensis.

In the context of the present invention, the active compound combinations or compositions according to the invention are applied on their own or in a suitable formulation to the seed. Preferably, the seed is treated in a state in which it is sufficiently stable so that the treatment does not cause any damage. In general, treatment of the seed may take place at any point in time between harvesting and sowing. Usually, the seed used is separated from the plant and freed from cobs, shells, stalks, coats, hairs or the flesh of the fruits. Thus, it is possible to use, for example, seed which has been harvested, cleaned and dried to a moisture content of less than 15 % by weight. Alternatively, it is also possible to use seed which, after drying, has been treated, for example, with water and then dried again.

When treating the seed, care must generally be taken that the amount of the composition according to the invention applied to the seed and/or the amount of further additives is chosen in such a way that the germination of the seed is not adversely affected, or that the resulting plant is not damaged. This must be borne in mind in particular in the case of active compounds which may have phytotoxic effects at certain application rates.

The compositions according to the invention can be applied directly, that is to say without comprising further components and without having been diluted. In general, it is preferable to apply the compositions to the seed in the form of a suitable formulation. Suitable formulations and methods for the treatment of seed are known to the person skilled in the art and are described, for example, in the following documents: US 4,272,417 A,

US 4,245,432 A, US 4,808,430 A, US 5,876,739 A, US 2003/0176428 A1, WO 2002/080675 A1, WO 2002/028186 A2.

The active compound combinations which can be used according to the invention can be converted into customary seed dressing formulations, such as solutions, emulsions, suspensions, powders, foams, slurries or other coating materials for seed, and also ULV formulations.

These formulations are prepared in a known manner by mixing the active compounds or active compound combinations with customary additives, such as, for example, customary extenders and also solvents or diluents, colorants, wetting agents, dispersants, emulsifiers, defoamers, preservatives, secondary thickeners, adhesives, gibberellins and water as well.

Suitable colorants that may be present in the seed dressing formulations which can be used according to the invention include all colorants customary for such purposes. Use may be made both of pigments, of sparing solubility in water, and of dyes, which are soluble in water. Examples that may be mentioned include the colorants known under the designations Rhodamine B, C.I. Pigment Red 112, and C.I. Solvent Red 1.

Suitable wetting agents that may be present in the seed dressing formulations which can be used according to the invention include all substances which promote wetting and are customary in the formulation of active agrochemical substances. With preference it is possible to use alkylnaphthalene-sulphonates, such as diisopropyl- or diisobutylnaphthalene-sulphonates.

Suitable dispersants and/or emulsifiers that may be present in the seed dressing formulations which can be used according to the invention include all nonionic, anionic, and cationic dispersants which are customary in the formulation of active agrochemical substances. With preference, it is possible to use nonionic or anionic dispersants or mixtures of nonionic or anionic dispersants. Particularly suitable nonionic dispersants are ethylene oxide-propylene oxide block polymers, alkylphenol polyglycol ethers, and tristyrylphenol polyglycol ethers, and their phosphated or sulphated derivatives. Particularly suitable anionic dispersants are lignosulphonates, polyacrylic salts, and arylsulphonate-formaldehyde condensates.

Defoamers that may be present in the seed dressing formulations to be used according to the invention include all foam-inhibiting compounds which are customary in the formulation of agrochemically active compounds. Preference is given to using silicone defoamers, magnesium stearate, silicone emulsions, long-chain alcohols, fatty acids and their salts and also organofluorine compounds and mixtures thereof.

Preservatives that may be present in the seed dressing formulations to be used according to the invention include all compounds which can be used for such purposes in agrochemical compositions. By way of example, mention may be made of dichlorophen and benzyl alcohol hemiformal.

Secondary thickeners that may be present in the seed dressing formulations to be used according to the invention include all compounds which can be used for such purposes in agrochemical compositions. Preference is given to cellulose derivatives, acrylic acid derivatives, polysaccharides, such as xanthan gum or Veegum, modified clays, phyllosilicates, such as attapulgite and bentonite, and also finely divided silicic acids.

Suitable adhesives that may be present in the seed dressing formulations to be used according to the invention include all customary binders which can be used in seed dressings. Polyvinylpyrrolidone, polyvinyl acetate, polyvinyl alcohol and tylose may be mentioned as being preferred.

Suitable gibberellins that may be present in the seed dressing formulations to be used according to the invention are preferably the gibberellins A1, A3 (= gibberellic acid), A4 and A7; particular preference is given to using gibberellic acid. The gibberellins are known (cf. R. Wegler "Chemie der Pflanzenschutz- and Schädlingsbekämpfungsmittel" [Chemistry of Crop Protection Agents and Pesticides], Vol. 2, Springer Verlag, 1970, pp. 401-412).

The seed dressing formulations which can be used according to the invention may be used directly or after dilution with water beforehand to treat seed of any of a very wide variety of types. The seed dressing formulations which can be used according to the invention or their dilute preparations may also be used to dress seed of transgenic plants. In this context, synergistic effects may also arise in interaction with the substances formed by expression.

Suitable mixing equipment for treating seed with the seed dressing formulations which can be used according to the invention or the preparations prepared from them by adding water includes all mixing equipment which can commonly be used for dressing. The specific procedure adopted when dressing comprises introducing the seed into a mixer, adding the particular desired amount of seed dressing formulation, either as it is or following dilution with water beforehand, and carrying out mixing until the formulation is uniformly distributed on the seed. Optionally, a drying operation follows.

The active compounds or compositions according to the invention have strong microbicidal activity and can be used for controlling unwanted microorganisms, such as fungi and bacteria, in crop protection and material protection.

In crop protection, fungicides can be used for controlling Plasmodiophoromycetes, Oomycetes, Chytridiomycetes, Zygomycetes, Ascomycetes, Basidiomycetes and Deuteromycetes.
In crop protection, bactericides can be used for controlling Pseudomonadaceae, Rhizobiaceae, Enterobacteriaceae, Corynebacteriaceae and Streptomycetaceae.

The fungicidal compositions according to the invention can be used for the curative or protective control of phytopathogenic fungi. Accordingly, the invention also relates to curative and protective methods for controlling phytopathogenic fungi using the active compound combinations or compositions according to the inven-

tion, which are applied to the seed, the plant or plant parts, the fruit or the soil in which the plants grow. Preference is given to application onto the plant or the plant parts, the fruits or the soil in which the plants grow.

The compositions according to the invention for combating phytopathogenic fungi in crop protection comprise an active, but non-phytotoxic amount of the compounds according to the invention. "Active, but non-phytotoxic amount" shall mean an amount of the composition according to the invention which is sufficient to control or to completely kill the plant disease caused by fungi, which amount at the same time does not exhibit noteworthy symptoms of phytotoxicity. These application rates generally may be varied in a broader range, which rate depends on several factors, e.g. the phytopathogenic fungi, the plant or crop, the climatic conditions and the ingredients of the composition according to the invention.

The fact that the active compounds, at the concentrations required for the controlling of plant diseases, are well tolerated by plants permits the treatment of aerial plant parts, of vegetative propagation material and seed, and of the soil.

According to the invention, it is possible to treat all plants and parts of plants. Plants are to be understood here as meaning all plants and plant populations, such as wanted and unwanted wild plants or crop plants (including naturally occurring crop plants). Crop plants can be plants which can be obtained by conventional breeding and optimization methods or by biotechnological and genetic engineering methods or combinations of these methods, including the transgenic plants and including plant cultivars which can or cannot be protected by plant variety protection rights. Parts of plants are to be understood as meaning all above-ground and below-ground parts and organs of the plants, such as shoot, leaf, flower and root, examples which may be mentioned being leaves, needles, stems, trunks, flowers, fruit bodies, fruits and seeds and also roots, tubers and rhizomes. Plant parts also include harvested material and vegetative and generative propagation material, for example seedlings, tubers, rhizomes, cuttings and seeds. Preference is given to the treatment of the plants and the above-ground and below-ground parts and organs of the plants, such as shoot, leaf, flower and root, examples which may be mentioned being leaves, needles, stems, trunks, flowers, and fruits.

The active compounds of the invention, in combination with good plant tolerance and favourable toxicity to warm-blooded animals and being tolerated well by the environment, are suitable for protecting plants and plant organs, for increasing the harvest yields, for improving the quality of the harvested material. They may be preferably employed as crop protection agents. They are active against normally sensitive and resistant species and against all or some stages of development.

The following plants may be mentioned as plants which can be treated according to the invention: cotton, flax, grapevines, fruit, vegetable, such as *Rosaceae sp.* (for example pomaceous fruit, such as apples and pears, but also stone fruit, such as apricots, cherries, almonds and peaches and soft fruit such as strawberries), *Ribesioidae sp.*, *Juglandaceae sp.*, *Betulaceae sp.*, *Anacardiaceae sp.*, *Fagaceae sp.*, *Moraceae sp.*, *Oleaceae sp.*, *Actinidaceae sp.*, *Lauraceae sp.*, *Musaceae sp.* (for example banana trees and plantations),

Rubiaceae sp. (for example coffee), *Theaceae sp.*, *Sterculiceae sp.*, *Rutaceae sp.* (for example lemons, oranges and grapefruit), *Solanaceae sp.* (for example tomatoes), *Liliaceae sp.*, *Asteraceae sp.* (for example lettuce), *Umbelliferae sp.*, *Cruciferae sp.*, *Chenopodiaceae sp.*, *Cucurbitaceae sp.* (for example cucumbers), *Alliaceae sp.* (for example leek, onions), *Papilionaceae sp.* (for example peas); major crop plants, such *Gramineae sp.* (for example maize, lawn, cereals such as wheat, rye, rice, barley, oats, millet and triticale), *Asteraceae sp.* (for example sunflowers), *Brassicaceae sp.* (for example white cabbage, red cabbage, broccoli, cauliflowers, Brussels sprouts, pak choi, kohlrabi, garden radish, and also oilseed rape, mustard, horseradish and cress), *Fabacae sp.* (for example beans, peas, peanuts), *Papilionaceae sp.* (for example soya beans), *Solanaceae sp.* (for example potatoes), *Chenopodiaceae sp.* (for example sugar beet, fodder beet, Swiss chard, beetroot); crop plants and ornamental plants in garden and forest; and also in each case genetically modified varieties of these plants.

As already mentioned above, it is possible to treat all plants and their parts according to the invention. In a preferred embodiment, wild plant species and plant cultivars, or those obtained by conventional biological breeding methods, such as crossing or protoplast fusion, and parts thereof, are treated. In a further preferred embodiment, transgenic plants and plant cultivars obtained by genetic engineering methods, if appropriate in combination with conventional methods (genetically modified organisms), and parts thereof are treated. The terms "parts", "parts of plants" and "plant parts" have been explained above. Particularly preferably, plants of the plant cultivars which are in each case commercially available or in use are treated according to the invention. Plant cultivars are to be understood as meaning plants having novel properties ("traits") which have been obtained by conventional breeding, by mutagenesis or by recombinant DNA techniques. These can be cultivars, bio- or genotypes.

The method of treatment according to the invention is used in the treatment of genetically modified organisms (GMOs), e.g. plants or seeds. Genetically modified plants (or transgenic plants) are plants of which a heterologous gene has been stably integrated into the genome. The expression "heterologous gene" essentially means a gene which is provided or assembled outside the plant and when introduced in the nuclear, chloroplastic or mitochondrial genome gives the transformed plant new or improved agronomic or other properties by expressing a protein or polypeptide of interest or by down regulating or silencing other gene(s) which are present in the plant (using for example, antisense technology, co-suppression technology or RNA interference – RNAi - technology). A heterologous gene that is located in the genome is also called a transgene. A transgene that is defined by its particular location in the plant genome is called a transformation or transgenic event.

Depending on the plant species or plant cultivars, their location and growth conditions (soils, climate, vegetation period, diet), the treatment according to the invention may also result in super-additive ("synergistic") effects. Thus, for example, reduced application rates and/or a widening of the activity spectrum and/or an increase in the activity of the active compounds and compositions which can be used according

to the invention, better plant growth, increased tolerance to high or low temperatures, increased tolerance to drought or to water or soil salt content, increased flowering performance, easier harvesting, accelerated maturation, higher harvest yields, bigger fruits, larger plant height, greener leaf color, earlier flowering, higher quality and/or a higher nutritional value of the harvested products, higher sugar concentration within the fruits, better storage stability and/or processability of the harvested products are possible, which exceed the effects which were actually to be expected.

At certain application rates, the active compound combinations according to the invention may also have a strengthening effect in plants. Accordingly, they are also suitable for mobilizing the defense system of the plant against attack by unwanted phytopathogenic fungi and/ or microorganisms and/or viruses. This may, if appropriate, be one of the reasons of the enhanced activity of the combinations according to the invention, for example against fungi. Plant-strengthening (resistance-inducing) substances are to be understood as meaning, in the present context, those substances or combinations of substances which are capable of stimulating the defense system of plants in such a way that, when subsequently inoculated with unwanted phytopathogenic fungi and/or microorganisms and/or viruses, the treated plants display a substantial degree of resistance to these phytopathogenic fungi and/or microorganisms and/or viruses, Thus, the substances according to the invention can be employed for protecting plants against attack by the abovementioned pathogens within a certain period of time after the treatment. The period of time within which protection is effected generally extends from 1 to 10 days, preferably 1 to 7 days, after the treatment of the plants with the active compounds.

Plants and plant cultivars which are preferably to be treated according to the invention include all plants which have genetic material which impart particularly advantageous, useful traits to these plants (whether obtained by breeding and/or biotechnological means).

Plants and plant cultivars which are also preferably to be treated according to the invention are resistant against one or more biotic stresses, i.e. said plants show a better defense against animal and microbial pests, such as against nematodes, insects, mites, phytopathogenic fungi, bacteria, viruses and/or viroids.

Plants and plant cultivars which may also be treated according to the invention are those plants which are resistant to one or more abiotic stresses. Abiotic stress conditions may include, for example, drought, cold temperature exposure, heat exposure, osmotic stress, flooding, increased soil salinity, increased mineral exposure, ozon exposure, high light exposure, limited availability of nitrogen nutrients, limited availability of phosphorus nutrients, shade avoidance.

Plants and plant cultivars which may also be treated according to the invention, are those plants characterized by enhanced yield characteristics. Increased yield in said plants can be the result of, for example, improved plant physiology, growth and development, such as water use efficiency, water retention efficiency, improved nitrogen use, enhanced carbon assimilation, improved photosynthesis, increased germination ef-

ficiency and accelerated maturation. Yield can furthermore be affected by improved plant architecture (under stress and non-stress conditions), including but not limited to, early flowering, flowering control for hybrid seed production, seedling vigor, plant size, internode number and distance, root growth, seed size, fruit size, pod size, pod or ear number, seed number per pod or ear, seed mass, enhanced seed filling, reduced seed dispersal, reduced pod dehiscence and lodging resistance. Further yield traits include seed composition, such as carbohydrate content, protein content, oil content and composition, nutritional value, reduction in anti-nutritional compounds, improved processability and better storage stability.

Plants that may be treated according to the invention are hybrid plants that already express the characteristic of heterosis or hybrid vigor which results in generally higher yield, vigor, health and resistance towards biotic and abiotic stress factors. Such plants are typically made by crossing an inbred male-sterile parent line (the female parent) with another inbred male-fertile parent line (the male parent). Hybrid seed is typically harvested from the male sterile plants and sold to growers. Male sterile plants can sometimes (e.g. in corn) be produced by detasseling, i.e. the mechanical removal of the male reproductive organs (or males flowers) but, more typically, male sterility is the result of genetic determinants in the plant genome. In that case, and especially when seed is the desired product to be harvested from the hybrid plants it is typically useful to ensure that male fertility in the hybrid plants is fully restored. This can be accomplished by ensuring that the male parents have appropriate fertility restorer genes which are capable of restoring the male fertility in hybrid plants that contain the genetic determinants responsible for male-sterility. Genetic determinants for male sterility may be located in the cytoplasm. Examples of cytoplasmic male sterility (CMS) were for instance described in Brassica species. However, genetic determinants for male sterility can also be located in the nuclear genome. Male sterile plants can also be obtained by plant biotechnology methods such as genetic engineering. A particularly useful means of obtaining male-sterile plants is described in WO 89/10396 in which, for example, a ribonuclease such as barnase is selectively expressed in the tapetum cells in the stamens. Fertility can then be restored by expression in the tapetum cells of a ribonuclease inhibitor such as barstar.

Plants or plant cultivars (obtained by plant biotechnology methods such as genetic engineering) which may be treated according to the invention are herbicide-tolerant plants, i.e. plants made tolerant to one or more given herbicides. Such plants can be obtained either by genetic transformation, or by selection of plants containing a mutation imparting such herbicide tolerance.

Herbicide-tolerant plants are for example glyphosate-tolerant plants, i.e. plants made tolerant to the herbicide glyphosate or salts thereof. Plants can be made tolerant to glyphosate through different means. For example, glyphosate-tolerant plants can be obtained by transforming the plant with a gene encoding the enzyme 5-enolpyruvylshikimate-3-phosphate synthase (EPSPS). Examples of such EPSPS genes are the AroA gene (mutant CT7) of the bacterium *Salmonella typhimurium*, the CP4 gene of the bacterium *Agrobacterium sp*, the genes encoding a Petunia EPSPS, a Tomato EPSPS, or an Eleusine EPSPS. It can also be

a mutated EPSPS. Glyphosate-tolerant plants can also be obtained by expressing a gene that encodes a glyphosate oxido-reductase enzyme. Glyphosate-tolerant plants can also be obtained by expressing a gene that encodes a glyphosate acetyl transferase enzyme. Glyphosate-tolerant plants can also be obtained by selecting plants containing naturally-occurring mutations of the above-mentioned genes.

Other herbicide resistant plants are for example plants that are made tolerant to herbicides inhibiting the enzyme glutamine synthase, such as bialaphos, phosphinothricin or glufosinate. Such plants can be obtained by expressing an enzyme detoxifying the herbicide or a mutant glutamine synthase enzyme that is resistant to inhibition. One such efficient detoxifying enzyme is an enzyme encoding a phosphinothricin acetyltransferase (such as the bar or pat protein from Streptomyces species). Plants expressing an exogenous phosphinothricin acetyltransferase are also described.

Further herbicide-tolerant plants are also plants that are made tolerant to the herbicides inhibiting the enzyme hydroxyphenylpyruvatedioxygenase (HPPD). Hydroxyphenylpyruvatedioxygenases are enzymes that catalyze the reaction in which para-hydroxyphenylpyruvate (HPP) is transformed into homogentisate. Plants tolerant to HPPD-inhibitors can be transformed with a gene encoding a naturally-occurring resistant HPPD enzyme, or a gene encoding a mutated HPPD enzyme. Tolerance to HPPD-inhibitors can also be obtained by transforming plants with genes encoding certain enzymes enabling the formation of homogentisate despite the inhibition of the native HPPD enzyme by the HPPD-inhibitor. Tolerance of plants to HPPD inhibitors can also be improved by transforming plants with a gene encoding an enzyme prephenate dehydrogenase in addition to a gene encoding an HPPD-tolerant enzyme.

Still further herbicide resistant plants are plants that are made tolerant to acetolactate synthase (ALS) inhibitors. Known ALS-inhibitors include, for example, sulfonylurea, imidazolinone, triazolopyrimidines, pyrimidinyoxy(thio)benzoates, and/or sulfonylaminocarbonyltriazolinone herbicides. Different mutations in the ALS enzyme (also known as acetohydroxyacid synthase, AHAS) are known to confer tolerance to different herbicides and groups of herbicides. The production of sulfonylurea-tolerant plants and imidazolinone-tolerant plants is described in WO 1996/033270. Other imidazolinone-tolerant plants are also described. Further sulfonylurea- and imidazolinone-tolerant plants are also described in for example WO 2007/024782.

Other plants tolerant to imidazolinone and/or sulfonylurea can be obtained by induced mutagenesis, selection in cell cultures in the presence of the herbicide or mutation breeding as described for example for soybeans, for rice, for sugar beet, for lettuce, or for sunflower.

Plants or plant cultivars (obtained by plant biotechnology methods such as genetic engineering) which may also be treated according to the invention are insect-resistant transgenic plants, i.e. plants made resistant to attack by certain target insects. Such plants can be obtained by genetic transformation, or by selection of plants containing a mutation imparting such insect resistance.

An "insect-resistant transgenic plant", as used herein, includes any plant containing at least one transgene comprising a coding sequence encoding:

1) an insecticidal crystal protein from *Bacillus thuringiensis* or an insecticidal portion thereof, such as the insecticidal crystal proteins listed online at: http://www.lifesci.sussex.ac.uk/Home/Neil_Crickmore/Bt/, or insecticidal portions thereof, e.g., proteins of the Cry protein classes Cry1Ab, Cry1Ac, Cry1F, Cry2Ab, Cry3Aa, or Cry3Bb or insecticidal portions thereof; or

2) a crystal protein from *Bacillus thuringiensis* or a portion thereof which is insecticidal in the presence of a second other crystal protein from *Bacillus thuringiensis* or a portion thereof, such as the binary toxin made up of the Cry34 and Cry35 crystal proteins; or

3) a hybrid insecticidal protein comprising parts of different insecticidal crystal proteins from *Bacillus thuringiensis,* such as a hybrid of the proteins of 1) above or a hybrid of the proteins of 2) above, e.g., the Cry1A.105 protein produced by corn event MON98034 (WO 2007/027777); or

4) a protein of any one of 1) to 3) above wherein some, particularly 1 to 10, amino acids have been replaced by another amino acid to obtain a higher insecticidal activity to a target insect species, and/or to expand the range of target insect species affected, and/or because of changes introduced into the encoding DNA during cloning or transformation, such as the Cry3Bb1 protein in corn events MON863 or MON88017, or the Cry3A protein in corn event MIR604;

5) an insecticidal secreted protein from *Bacillus thuringiensis* or *Bacillus cereus*, or an insecticidal portion thereof, such as the vegetative insecticidal (VIP) proteins listed at: http://www.lifesci.sussex.ac.uk/home/Neil_Crickmore/Bt/vip.html, e.g. proteins from the VIP3Aa protein class; or

6) secreted protein from *Bacillus thuringiensis* or *Bacillus cereus* which is insecticidal in the presence of a second secreted protein from *Bacillus thuringiensis* or *B. cereus*, such as the binary toxin made up of the VIP1A and VIP2A proteins; or

7) hybrid insecticidal protein comprising parts from different secreted proteins from *Bacillus thuringiensis* or *Bacillus cereus,* such as a hybrid of the proteins in 1) above or a hybrid of the proteins in 2) above; or

8) protein of any one of 1) to 3) above wherein some, particularly 1 to 10, amino acids have been replaced by another amino acid to obtain a higher insecticidal activity to a target insect species, and/or to expand the range of target insect species affected, and/or because of changes introduced into the encoding DNA during cloning or transformation (while still encoding an insecticidal protein), such as the VIP3Aa protein in cotton event COT102.

Of course, an insect-resistant transgenic plant, as used herein, also includes any plant comprising a combination of genes encoding the proteins of any one of the above classes 1 to 8. In one embodiment, an insect-resistant plant contains more than one transgene encoding a protein of any one of the above classes 1 to 8,

to expand the range of target insect species affected when using different proteins directed at different target insect species, or to delay insect resistance development to the plants by using different proteins insecticidal to the same target insect species but having a different mode of action, such as binding to different receptor binding sites in the insect.

Plants or plant cultivars (obtained by plant biotechnology methods such as genetic engineering) which may also be treated according to the invention are tolerant to abiotic stresses. Such plants can be obtained by genetic transformation, or by selection of plants containing a mutation imparting such stress resistance. Particularly useful stress tolerance plants include:

a. plants which contain a transgene capable of reducing the expression and/or the activity of poly(ADP-ribose)polymerase (PARP) gene in the plant cells or plants

b. plants which contain a stress tolerance enhancing transgene capable of reducing the expression and/or the activity of the PARG encoding genes of the plants or plants cells.

c. plants which contain a stress tolerance enhancing transgene coding for a plant-functional enzyme of the nicotinamide adenine dinucleotide salvage synthesis pathway including nicotinamidase, nicotinate phosphoribosyltransferase, nicotinic acid mononucleotide adenyl transferase, nicotinamide adenine dinucleotide synthetase or nicotine amide phosphorybosyltransferase.

Plants or plant cultivars (obtained by plant biotechnology methods such as genetic engineering) which may also be treated according to the invention show altered quantity, quality and/or storage-stability of the harvested product and/or altered properties of specific ingredients of the harvested product such as :

1) transgenic plants which synthesize a modified starch, which in its physical-chemical characteristics, in particular the amylose content or the amylose/amylopectin ratio, the degree of branching, the average chain length, the side chain distribution, the viscosity behaviour, the gelling strength, the starch grain size and/or the starch grain morphology, is changed in comparison with the synthesised starch in wild type plant cells or plants, so that this is better suited for special applications.

2) transgenic plants which synthesize non starch carbohydrate polymers or which synthesize non starch carbohydrate polymers with altered properties in comparison to wild type plants without genetic modification. Examples are plants producing polyfructose, especially of the inulin and levan-type, plants producing alpha 1,4 glucans, plants producing alpha-1,6 branched alpha-1,4-glucans, plants producing alternan,

3) transgenic plants which produce hyaluronan.

Plants or plant cultivars (that can be obtained by plant biotechnology methods such as genetic engineering) which may also be treated according to the invention are plants, such as cotton plants, with altered fiber characteristics. Such plants can be obtained by genetic transformation or by selection of plants contain a mutation imparting such altered fiber characteristics and include:

a) Plants, such as cotton plants, containing an altered form of cellulose synthase genes,

b) Plants, such as cotton plants, containing an altered form of rsw2 or rsw3 homologous nucleic acids,

c) Plants, such as cotton plants, with increased expression of sucrose phosphate synthase,

d) Plants, such as cotton plants, with increased expression of sucrose synthase,

e) Plants, such as cotton plants, wherein the timing of the plasmodesmatal gating at the basis of the fiber cell is altered, e.g. through downregulation of fiberselective β 1,3-glucanase,

f) Plants, such as cotton plants, having fibers with altered reactivity, e.g. through the expression of N-acteylglucosaminetransferase gene including nodC and chitinsynthase genes.

Plants or plant cultivars (that can be obtained by plant biotechnology methods such as genetic engineering) which may also be treated according to the invention are plants, such as oilseed rape or related Brassica plants, with altered oil profile characteristics. Such plants can be obtained by genetic transformation or by selection of plants contain a mutation imparting such altered oil characteristics and include:

a) Plants, such as oilseed rape plants, producing oil having a high oleic acid content,

b) Plants such as oilseed rape plants, producing oil having a low linolenic acid content,

c) Plant such as oilseed rape plants, producing oil having a low level of saturated fatty acids.

Particularly useful transgenic plants which may be treated according to the invention are plants which comprise one or more genes which encode one or more toxins, such as the following which are sold under the trade names YIELD GARD® (for example maize, cotton, soya beans), KnockOut® (for example maize), BiteGard® (for example maize), Bt-Xtra® (for example maize), StarLink® (for example maize), Bollgard® (cotton), Nucotn® (cotton), Nucotn 33B®(cotton), NatureGard® (for example maize), Protecta® and New-Leaf® (potato). Examples of herbicide-tolerant plants which may be mentioned are maize varieties, cotton varieties and soya bean varieties which are sold under the trade names Roundup Ready® (tolerance to glyphosate, for example maize, cotton, soya bean), Liberty Link® (tolerance to phosphinotricin, for example oilseed rape), IMI® (tolerance to imidazolinones) and STS® (tolerance to sulphonylureas, for example maize). Herbicide-resistant plants (plants bred in a conventional manner for herbicide tolerance) which may be mentioned include the varieties sold under the name Clearfield® (for example maize).

Particularly useful transgenic plants which may be treated according to the invention are plants containing transformation events, or combination of transformation events, that are listed for example in the databases from various national or regional regulatory agencies (see for example http://gmoinfo.jrc.it/gmp_browse.aspx and http://www.agbios.com/dbase.php).

In material protection the substances of the invention may be used for the protection of technical materials against infestation and destruction by undesirable fungi and/or microorganisms.

Technical materials are understood to be in the present context non-living materials that have been prepared for use in engineering. For example, technical materials that are to be protected against microbiological change or destruction by the active materials of the invention can be adhesives, glues, paper and

cardboard, textiles, carpets, leather, wood, paint and plastic articles, cooling lubricants and other materials that can be infested or destroyed by micro-organisms. Within the context of materials to be protected are also parts of production plants and buildings, for example cooling circuits, cooling and heating systems, air conditioning and ventilation systems, which can be adversely affected by the propagation of fungi and/or microorganisms. Within the context of the present invention, preferably mentioned as technical materials are adhesives, glues, paper and cardboard, leather, wood, paints, cooling lubricants and heat exchanger liquids, particularly preferred is wood. The combinations according to the invention can prevent disadvantageous effects like decaying, dis- and decoloring, or molding. The active compound combinations and compositions according to the invention can likewise be employed for protecting against colonization of objects, in particular ship hulls, sieves, nets, buildings, quays and signalling installations, which are in contact with sea water or brackish water.

The method of treatment according to the invention can also be used in the field of protecting storage goods against attack of fungi and microorganisms. According to the present invention, the term "storage goods" is understood to denote natural substances of vegetable or animal origin and their processed forms, which have been taken from the natural life cycle and for which long-term protection is desired. Storage goods of vegetable origin, such as plants or parts thereof, for example stalks, leafs, tubers, seeds, fruits or grains, can be protected in the freshly harvested state or in processed form, such as pre-dried, moistened, comminuted, ground, pressed or roasted. Also falling under the definition of storage goods is timber, whether in the form of crude timber, such as construction timber, electricity pylons and barriers, or in the form of finished articles, such as furniture or objects made from wood. Storage goods of animal origin are hides, leather, furs, hairs and the like. The combinations according the present invention can prevent disadvantageous effects such as decay, discoloration or mold. Preferably "storage goods" is understood to denote natural substances of vegetable origin and their processed forms, more preferably fruits and their processed forms, such as pomes, stone fruits, soft fruits and citrus fruits and their processed forms.

Some pathogens of fungal diseases which can be treated according to the invention may be mentioned by way of example, but not by way of limitation:

Diseases caused by powdery mildew pathogens, such as, for example, Blumeria species, such as, for example, Blumeria graminis; Podosphaera species, such as, for example, Podosphaera leucotricha; Sphaerotheca species, such as, for example, Sphaerotheca fuliginea; Uncinula species, such as, for example, Uncinula necator;

Diseases caused by rust disease pathogens, such as, for example, Gymnosporangium species, such as, for example, Gymnosporangium sabinae; Hemileia species, such as, for example, Hemileia vastatrix; Phakopsora species, such as, for example, Phakopsora pachyrhizi and Phakopsora meibomiae; Puccinia species, such as, for example, Puccinia recondita or Puccinia triticina; Uromyces species, such as, for example, Uromyces appendiculatus;

Diseases caused by pathogens from the group of the Oomycetes, such as, for example, Bremia species, such as, for example, Bremia lactucae; Peronospora species, such as, for example, Peronospora pisi or P. brassicae; Phytophthora species, such as, for example Phytophthora infestans; Plasmopara species, such as, for example, Plasmopara viticola; Pseudoperonospora species, such as, for example, Pseudoperonospora humuli or Pseudoperonospora cubensis; Pythium species, such as, for example, Pythium ultimum;

Leaf blotch diseases and leaf wilt diseases caused, for example, by Alternaria species, such as, for example, Alternaria solani; Cercospora species, such as, for example, Cercospora beticola; Cladiosporium species, such as, for example, Cladiosporium cucumerinum; Cochliobolus species, such as, for example, Cochliobolus sativus (conidia form: Drechslera, Syn: Helminthosporium); Colletotrichum species, such as, for example, Colletotrichum lindemuthanium; Cycloconium species, such as, for example, Cycloconium oleaginum; Diaporthe species, such as, for example, Diaporthe citri; Elsinoe species, such as, for example, Elsinoe fawcettii; Gloeosporium species, such as, for example, Gloeosporium laeticolor; Glomerella species, such as, for example, Glomerella cingulata; Guignardia species, such as, for example, Guignardia bidwelli; Leptosphaeria species, such as, for example, Leptosphaeria maculans; Magnaporthe species, such as, for example, Magnaporthe grisea; Microdochium species, such as, for example, Microdochium nivale; Mycosphaerella species, such as, for example, Mycosphaerella graminicola and M. fijiensis; Phaeosphaeria species, such as, for example, Phaeosphaeria nodorum; Pyrenophora species, such as, for example, Pyrenophora teres; Ramularia species, such as, for example, Ramularia collo-cygni; Rhynchosporium species, such as, for example, Rhynchosporium secalis; Septoria species, such as, for example, Septoria apii; Typhula species, such as, for example, Typhula incarnata; Venturia species, such as, for example, Venturia inaequalis;

Root and stem diseases caused, for example, by Corticium species, such as, for example, Corticium graminearum; Fusarium species, such as, for example, Fusarium oxysporum; Gaeumannomyces species, such as, for example, Gaeumannomyces graminis; Rhizoctonia species, such as, for example Rhizoctonia solani; Tapesia species, such as, for example, Tapesia acuformis; Thielaviopsis species, such as, for example, Thielaviopsis basicola;

Ear and panicle diseases (including maize cobs) caused, for example, by Alternaria species, such as, for example, Alternaria spp.; Aspergillus species, such as, for example, Aspergillus flavus; Cladosporium species, such as, for example, Cladosporium cladosporioides; Claviceps species, such as, for example, Claviceps purpurea; Fusarium species, such as, for example, Fusarium culmorum; Gibberella species, such as, for example, Gibberella zeae; Monographella species, such as, for example, Monographella nivalis; Septoria species, such as for example, Septoria nodorum;

Diseases caused by smut fungi, such as, for example, Sphacelotheca species, such as, for example, Sphacelotheca reiliana; Tilletia species, such as, for example, Tilletia caries; T. controversa; Urocystis species, such as, for example, Urocystis occulta; Ustilago species, such as, for example, Ustilago nuda; U. nuda tritici;

Fruit rot caused, for example, by Aspergillus species, such as, for example, Aspergillus flavus; Botrytis species, such as, for example, Botrytis cinerea; Penicillium species, such as, for example, Penicillium ex-

pansum and P. purpurogenum; Sclerotinia species, such as, for example, Sclerotinia sclerotiorum; Verticilium species, such as, for example, Verticilium alboatrum;

Seed- and soil-borne rot and wilt diseases, and also diseases of seedlings, caused, for example, by Fusarium species, such as, for example, Fusarium culmorum; Phytophthora species, such as, for example, Phytophthora cactorum; Pythium species, such as, for example, Pythium ultimum; Rhizoctonia species, such as, for example, Rhizoctonia solani; Sclerotium species, such as, for example, Sclerotium rolfsii;

Cancerous diseases, galls and witches' broom caused, for example, by Nectria species, such as, for example, Nectria galligena;

Wilt diseases caused, for example, by Monilinia species, such as, for example, Monilinia laxa;

Deformations of leaves, flowers and fruits caused, for example, by Taphrina species, such as, for example, Taphrina deformans;

Degenerative diseases of woody plants caused, for example, by Esca species, such as, for example, Phaemoniella clamydospora and Phaeoacremonium aleophilum and Fomitiporia mediterranea;

Diseases of flowers and seeds caused, for example, by Botrytis species, such as, for example, Botrytis cinerea;

Diseases of plant tubers caused, for example, by Rhizoctonia species, such as, for example, Rhizoctonia solani; Helminthosporium species, such as, for example, Helminthosporium solani;

Diseases caused by bacteriopathogens, such as, for example, Xanthomonas species, such as, for example, Xanthomonas campestris pv. oryzae; Pseudomonas species, such as, for example, Pseudomonas syringae pv. lachrymans; Erwinia species, such as, for example, Erwinia amylovora.

Preference is given to controlling the following diseases of soya beans:

Fungal diseases on leaves, stems, pods and seeds caused, for example, by alternaria leaf spot (Alternaria spec. atrans tenuissima), anthracnose (Colletotrichum gloeosporoides dematium var. truncatum), brown spot (Septoria glycines), cercospora leaf spot and blight (Cercospora kikuchii), choanephora leaf blight (Choanephora infundibulifera trispora (Syn.)), dactuliophora leaf spot (Dactuliophora glycines), downy mildew (Peronospora manshurica), drechslera blight (Drechslera glycini), frogeye leaf spot (Cercospora sojina), leptosphaerulina leaf spot (Leptosphaerulina trifolii), phyllostica leaf spot (Phyllosticta sojaecola), pod and stem blight (Phomopsis sojae), powdery mildew (Microsphaera diffusa), pyrenochaeta leaf spot (Pyrenochaeta glycines), rhizoctonia aerial, foliage, and web blight (Rhizoctonia solani), rust (Phakopsora pachyrhizi Phakopsora meibomiae), scab (Sphaceloma glycines), stemphylium leaf blight (Stemphylium botryosum), target spot (Corynespora cassiicola).

Fungal diseases on roots and the stem base caused, for example, by black root rot (Calonectria crotalariae), charcoal rot (Macrophomina phaseolina), fusarium blight or wilt, root rot, and pod and collar rot (Fusarium oxysporum, Fusarium orthoceras, Fusarium semitectum, Fusarium equiseti), mycoleptodiscus root rot (Mycoleptodiscus terrestris), neocosmospora (Neocosmopspora vasinfecta), pod and stem blight (Diaporthe phaseolorum), stem canker (Diaporthe phaseolorum var. caulivora), phytophthora rot (Phytophthora megasperma), brown stem rot (Phialophora gregata), pythium rot (Pythium aphaniderma-

tum, Pythium irregulare, Pythium debaryanum, Pythium myriotylum, Pythium ultimum), rhizoctonia root rot, stem decay, and damping-off (Rhizoctonia solani), sclerotinia stem decay (Sclerotinia sclerotiorum), sclerotinia Southern blight (Sclerotinia rolfsii), thielaviopsis root rot (Thielaviopsis basicola).

It is also possible to control resistant strains of the organisms mentioned above.

Microorganisms capable of degrading or changing the industrial materials which may be mentioned are, for example, bacteria, fungi, yeasts, algae and slime organisms. The active compounds according to the invention preferably act against fungi, in particular moulds, wood-discolouring and wood-destroying fungi (Basidiomycetes) and against slime organisms and algae. Microorganisms of the following genera may be mentioned as examples: Alternaria, such as Alternaria tenuis, Aspergillus, such as Aspergillus niger, Chaetomium, such as Chaetomium globosum, Coniophora, such as Coniophora puetana, Lentinus, such as Lentinus tigrinus, Penicillium, such as Penicillium glaucum, Polyporus, such as Polyporus versicolor, Aureobasidium, such as Aureobasidium pullulans, Sclerophoma, such as Sclerophoma pityophila, Trichoderma, such as Trichoderma viride, Escherichia, such as Escherichia coli, Pseudomonas, such as Pseudomonas aeruginosa, and Staphylococcus, such as Staphylococcus aureus.

In addition, the compounds of the formula (I) according to the invention also have very good antimycotic activity. They have a very broad antimycotic activity spectrum in particular against dermatophytes and yeasts, moulds and diphasic fungi (for example against Candida species such as Candida albicans, Candida glabrata) and Epidermophyton floccosum, Aspergillus species such as Aspergillus niger and Aspergillus fumigatus, Trichophyton species such as Trichophyton mentagrophytes, Microsporon species such as Microsporon canis and audouinii. The list of these fungi by no means limits the mycotic spectrum which can be covered, but is only for illustration.

When applying the compounds according to the invention the application rates can be varied within a broad range. The dose of active compound/application rate usually applied in the method of treatment according to the invention is generally and advantageously

- for treatment of part of plants, e.g. leafs (foliar treatment): from 0.1 to 10,000 g/ha, preferably from 10 to 1,000 g/ha, more preferably from 50 to 300g/ha; in case of drench or drip application, the dose can even be reduced, especially while using inert substrates like rockwool or perlite;
- for seed treatment: from 2 to 200 g per 100 kg of seed, preferably from 3 to 150 g per 100 kg of seed, more preferably from 2.5 to 25 g per 100 kg of seed, even more preferably from 2.5 to 12.5 g per 100 kg of seed;
- for soil treatment: from 0.1 to 10,000 g/ha, preferably from 1 to 5,000 g/ha.

The doses herein indicated are given as illustrative examples of the method according to the invention. A person skilled in the art will know how to adapt the application doses, notably according to the nature of the plant or crop to be treated.

The combination according to the invention can be used in order to protect plants within a certain time range after the treatment against pests and/or phytopathogenic fungi and/or microorganisms. The time range, in which protection is effected, spans in general 1 to 28 days, preferably 1 to 14 days, more preferably 1 to 10 days, even more preferably 1 to 7 days after the treatment of the plants with the combinations or up to 200 days after the treatment of plant propagation material.

Furthermore combinations and compositions according to the invention may also be used to reduce the contents of mycotoxins in plants and the harvested plant material and therefore in foods and animal feed stuff made therefrom. Especially but not exclusively the following mycotoxins can be specified: Deoxynivalenole (DON), Nivalenole, 15-Ac-DON, 3-Ac-DON, T2- und HT2- Toxins, Fumonisines, Zearalenone Moniliformine, Fusarine, Diaceotoxyscirpenole (DAS), Beauvericine, Enniatine, Fusaroproliferine, Fusarenole, Ochratoxines, Patuline, Ergotalkaloides und Aflatoxines, which are caused for example by the following fungal diseases: *Fusarium spec.*, like *Fusarium acuminatum, F. avenaceum, F. crookwellense, F. culmorum, F. graminearum (Gibberella zeae), F. equiseti, F. fujikoroi, F. musarum, F. oxysporum, F. proliferatum, F. poae, F. pseudograminearum, F. sambucinum, F. scirpi, F. semitectum, F. solani, F. sporotrichoides, F. langsethiae, F. subglutinans, F. tricinctum, F. verticillioides* and others but also by *Aspergillus spec., Penicillium spec., Claviceps purpurea, Stachybotrys spec.* and others.

The good fungicidal activity of the active compound combinations according to the invention is evident from the example below. While the individual active compounds exhibit weaknesses with regard to the fungicidal activity, the combinations have an activity which exceeds a simple addition of activities.
A synergistic effect of fungicides is always present when the fungicidal activity of the active compound combinations exceeds the total of the activities of the active compounds when applied individually.

The expected activity for a given combination of two active compounds can be calculated as follows (cf. Colby, S.R., "Calculating Synergistic and Antagonistic Responses of Herbicide Combinations", *Weeds* **1967**, *15*, 20-22):

If

X is the efficacy when active compound A is applied at an application rate of m ppm (or g/ha),

Y is the efficacy when active compound B is applied at an application rate of n ppm (or g/ha),

E is the efficacy when the active compounds A and B are applied at application rates of m and n ppm (or g/ha), respectively, and

then $E = X + Y - \frac{X \cdot Y}{100}$

The degree of efficacy, expressed in % is denoted. 0 % means an efficacy which corresponds to that of the control while an efficacy of 100 % means that no disease is observed.

If the actual fungicidal activity exceeds the calculated value, then the activity of the combination is super-additive, i.e. a synergistic effect exists. In this case, the efficacy which was actually observed must be greater than the value for the expected efficacy (E) calculated from the abovementioned formula.

A further way of demonstrating a synergistic effect is the method of Tammes (cf. "Isoboles, a graphic representation of synergism in pesticides" in *Neth. J. Plant Path.*, **1964**, *70*, 73-80).

The invention is illustrated by the examples below. However, the invention is not limited to the examples.

Examples

2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2,6-difluoro-4-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone (I-4)

***tert*-butyl 4-{4-[5-(2,6-difluoro-4-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidine-1-carboxylate**

To a solution of *tert*-butyl 4-{4-[(Z/E)-(hydroxyimino)methyl]-1,3-thiazol-2-yl}piperidine-1-carboxylate (1.75 g) and 3,5-difluoro-4-vinylphenol (1.05 g) in ethyl acetate (45 ml) were added, at room temperature, potassium bicarbonate (2.81 g) and N-chlorosuccinimide (0.90 g), and then one drop of water. The reaction mixture was stirred at 60°C for 4 hours, then admixed with ethyl acetate and water and extracted with ethyl acetate. The organic extracts were dried over sodium sulphate and concentrated under reduced pressure. The residue was purified by chromatography. This gave *tert*-butyl 4-{4-[5-(2,6-difluoro-4-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidine-1-carboxylate (0.62 g).

^{1}H NMR (DMSO-d_6, 400 MHz): δ_{ppm} : 1.41 (s, 9H), 1.48-1.62 (m, 2H), 1.98-2.08 (m, 2H), 2.81-2.96 (m, 2H), 3.45 (dd, 1H), 3.80 (dd, 1H), 3.96-4.06 (m, 2H), 5.87 (dd, 1H), 6.50 (m, 2H), 7.98 (s, 1H), 10.50 (s, 1H)

logP (HCOOH): 3,24

MS (ESI): 366 ($[M-C(CH3)_3OCO+H]^+$)

4-{4-[5-(2,6-difluoro-4-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidinium chloride

To a solution of *tert*-butyl 4-{4-[5-(2,6-difluoro-4-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidine-1-carboxylate (620 mg) in dichloromethane (4 ml) was added dropwise, at 0°C, a 4 molar solution of hydrogen chloride in 1,4-dioxane (8.5 ml). The reaction mixture was stirred at 0°C and then gradually warmed to room temperature. After stirring for 3 h at room temperature, the solvent and excess hydrogen chloride were removed. This gave 4-{4-[5-(2,6-difluoro-4-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidinium chloride (492 mg).

^{1}H NMR (DMSO-d_6, 400 MHz): δ_{ppm} : 1.41 (s, 9H), 1.48-1.62 (m, 2H), 1.98-2.08 (m, 2H), 2.81-2.96 (m, 2H), 3.45 (dd, 1H), 3.80 (dd, 1H), 3.96-4.06 (m, 2H), 5.87 (dd, 1H), 6.50 (m, 2H), 7.98 (s, 1H), 10.50 (s, 1H)

logP (HCOOH): 0.98

MS (ESI): 366 ([M-Cl+H]$^+$)

2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-(4-{4-[5-(2,6-difluoro-4-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)ethanone

Solution A: To a solution of [3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]acetic acid (305 mg) in dichloromethane (10 ml) were added dropwise, at room temperature, one drop of N,N-dimethylformamide and oxalyl chloride (0.320 ml). After stirring at room temperature for two hours, the solvent was removed and the residue was dissolved again in dichloromethane (5 ml) (solution A).

To a solution of 4-{4-[5-(2,6-difluoro-4-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidinium chloride (492 mg) in dichloromethane (14 ml) was added, at room temperature, triethylamine (1.7 ml). After 15 minutes, solution A was added dropwise. After stirring at room temperature overnight, the reaction mixture was admixed with water and extracted with ethyl acetate. The organic extracts were dried over sodium sulphate and concentrated under reduced pressure. The residue was purified by chromatography. This gave 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-(4-{4-[5-(2,6-difluoro-4-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)ethanone (360 mg).

^{1}H NMR (DMSO-d_6, 400 MHz): δ_{ppm} : 1.51-1.61 (m, 1H), 1.77-1.85 (m, 1H), 2.06-2.17 (m, 2H), 2.79-2.87 (m, 1H), 3.23-3.31 (m, 1H), 3.46 (dd, 1H), 3.81 (dd, 1H), 3.93-4.00 (m, 1H), 4.31-4.39 (m, 1H), 5.32-5.48 (m, 2H), 5.88 (dd, 1H), 6.49 (m, 2H), 6.91 (s, 1H), 7.04 (t, 1H), 7.18 (t, 1H), 8.01 (s, 1H), 10.72 (s, 1H)

logP (HCOOH): 2.58

MS (ESI): 574 ([M+H]$^+$)

2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2,6-difluoro-4-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone

To a solution of 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-(4-{4-[5-(2,6-difluoro-4-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)ethanone (384 mg) and potassium carbonate (138 mg) in N,N-dimethylformamide (18 ml) are added, at room temperature, potassium iodide (61 mg) and 3-bromoprop-1-yne (127 mg) . The reaction mixture is stirred at 80°C for 9 h. Then the mixture is admixed with dilute hydrochloric acid and extracted with ethyl acetate. The combined organic phases are dried over sodium sulphate and concentrated. Purification by column chromatography gives 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2,6-difluoro-4-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone (60 mg).

^{1}H NMR (DMSO-d_6, 400 MHz): δ_{ppm} : 1.51-1.65 (m, 1H), 1.74-1.88 (m, 1H), 2.05-2.19 (m, 2H), 2.80-2.91 (m, 1H), 3.50 (dd, 1H), 3.65 (t, 1H), 3.85 (dd, 1H), 3.93-4.03 (m, 1H), 4.31-4.41 (m, 1H), 4.88 (d, 2H), 5.31-5.48 (m, 2H), 5.92 (dd, 1H), 6.85 (m, 2H), 6.90 (s, 1H), 7.02 (t, 1H), 7.18 (t, 1H), 8.02 (s, 1H)

logP (HCOOH): 3.30

MS (ESI): 612 ([M+H]$^+$)

2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2,6-difluoro-3-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone (I-7)

tert-butyl 4-{4-[5-(2,6-difluoro-3-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidine-1-carboxylate

To a solution of *tert*-butyl 4-{4-[(hydroxyimino)methyl]-1,3-thiazol-2-yl}piperidine-1-carboxylate (1.278 g) in ethyl acetate (80 ml) was added, at room temperature, N-chlorosuccinimide (658 mg). After stirring at 60°C for 30 min, 2,4-difluoro-3-vinylphenol (705 mg), potassium hydrogencarbonate (822 mg) and then one drop of water were added, at room temperature, to the reaction mixture. After stirring overnight at room temperature, the reaction mixture was admixed with ethyl acetate and water and extracted with ethyl acetate. The organic extracts were dried over sodium sulphate and concentrated under reduced pressure. The residue was purified by chromatography. This gave tert-butyl 4-{4-[5-(2,6-difluoro-3-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidine-1-carboxylate (658 mg).

^{1}H NMR (DMSO-d_6, 400 MHz): δ_{ppm} : 9.92 (s, 1H), 8.01 (s, 1H), 7.04-6.90 (m, 2H), 5.96 (dd, 1H), 4.01 (bd, 2H), 3.94-3.84 (m, 1H), 3.50 (dd, 1H), 2.10-2.00 (m, 2H), 1.63-1.50 (m, 2H), 1.42 (s, 9H)

2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-(4-{4-[5-(2,6-difluoro-3-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)ethanone

To a solution of tert-butyl 4-{4-[5-(2,6-difluoro-3-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidine-1-carboxylate (3.92 g) in dichloromethane (15 ml) was added dropwise, at 0°C, a 4 molar solution of hydrogen chloride (10 eq.) in 1,4-dioxane. The reaction mixture was stirred at 0°C and then gradually warmed to room temperature. After stirring for 5 hours, the solvent and excess hydrogen chloride were removed. This gave 4-{4-[5-(2,6-difluoro-3-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidinium chloride. (compound A)

To a solution of [3,5-bis-(difluoromethyl)-1H-pyrazol-1-yl]acetic acid (2 g) in dichloromethane (40 ml) are added, at 0°C, oxalyl chloride (3.273 g) and one drop of N,N-dimethylformamide. The reaction mixture is stirred at room temperature for 2 hours. The solvent and the excess reagent are removed under reduced pressure. The solid residue is again dissolved in dichloromethane (15 ml) and, at 0°C, added dropwise to a solution of 4-{4-[5-(2,6-difluoro-3-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidinium chloride (compound A) and triethylamine (5.0 eq.) in dichloromethane (100 ml). The reaction mixture is stirred at room temperature overnight. Then it is admixed with concentrated sodium hydrogencarbonate solution, and the aqueous phase is removed and extracted with ethyl acetate. The combined organic phases are dried over sodium sulphate and concentrated. Purification by column chromatography gives 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-(4-{4-[5-(2,6-difluoro-3-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)ethanone (1.818 g).

^{1}H NMR (DMSO-d_6, 400 MHz): δ_{ppm} : 9.91 (s, 1H), 8.03 (s, 1H), 7.18 (t, 1H), 7.03 (t, 1H), 7.02-6.88 (m, 3H), 5.96 (dd, 1H), 5.40 (q, 2H), 4.36 (bd, 1H), 4.02-3.84 (m, 2H), 3.55 (dd, 1H), 3.45-3.22 (m, 2H), 2.84 (t, 1H), 2.11 (t, 2H), 1.88-1.75 (m, 1H), 1.65-1.50 (m, 1H)

logP (HCOOH): 2.61

2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2,6-difluoro-3-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

To a solution of 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-(4-{4-[5-(2,6-difluoro-3-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)ethanone (1.82 g) and potassium carbonate (657 mg) in N,N-dimethylformamide (15 ml)are added, at room temperature, potassium iodide (289 mg) and 3-bromoprop-1-yne (755 mg)) (80 wt %in toluene). The reaction mixture is stirred at 80°C for 4 h. Then the mixture is admixed with saturated aqueous solution of ammonium chloride and extracted with ethyl acetate. The combined organic phases are dried over sodium sulphate and concentrated. Purification by column chromatography gives 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2,6-difluoro-3-

(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone, (1.68 g).

^{1}H NMR (DMSO-d_6, 400 MHz): δ_{ppm} : 8.03 (s, 1H), 7.46-7.26 (m, 1H), 7.18 (t, 1H), 7.20-7.08 (m, 1H), 7.03 (t, 1H), 6.91 (s, 1H), 5.99 (dd, 1H), 5.40 (q, 2H), 4.89 (d, 2H), 4.35 (bs, 1H), 4.06-3.85 (m, 2H), 3.64 (t, 1H), 3.54 (dd, 1H), 3.46-3.21 (m, 2H), 2.84 (t, 1H), 2.12 (t, 2H), 1.89-1.75 (m, 1H), 1.65-1.50 (m, 1H).

logP (HCOOH): 3.17

The following examples can be synthesized accordingly:

(I-1) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone log p: 3,24[b]; 3,34[c]

(I-2) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[4-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone log p: 3,08[b]; 3,14[c]

(I-3) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[3-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone log p: 3,16[b]; 3,24[c]

(I-5) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-fluoro-6-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone log p: 3,15[b]; 3,18[c]

(I-6) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-chloro-6-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone log p: 3,51[a]; 3,4[b]

(I-8) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[5-fluoro-2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone log p: 3,37[b]; 3,44[c]

(I-9) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[4-methoxy-2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone log p: 3,25[b]; 3,2[c]

(I-10) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[3-fluoro-2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone log p: 3,37[b]; 3,48[c]

Measurement of logP values was performed according EEC directive 79/831 Annex V.A8 by HPLC (High Performance Liquid

Chromatography) on reversed phase columns with the following methods:

[a] Measurement was done at pH 2.3 with 0,1% phosphoric acid and acetonitrile as eluent.

[b]measurement of LC-MS was done at pH 2,7 with 0,1 % formic acid in water and with acetonitrile (contains 0,1% formic acid) as eluent with a linear gradient from 10 % acetonitrle to 95 % acetonitrile.

[c] Measurement with LC-MS was done at pH 7.8 with 0,001 molar ammonium hydrogen carbonate solution in water as eluent with a linear gradient from 10 % acetonitrile to 95 % acetonitrile.

Calibration was done with not branched alkan2-ones (with 3 to 16 carbon atoms) with known logP-values (measurement of logP values using retention times with linear interpolation between successive alkanones).. lambda-maX-values were determined using UV-spectra from 200 nm to 400 nm and the peak values of the chromatographic signals.

NMR Peak lists

1H-NMR data of selected examples are written in form of 1H-NMR-peak lists. To each signal peak are listed the δ-value in ppm and the signal intensity with space as delimiter. Between the δ-value – signal intensity pairs are semicolons as delimiters.

The peak list of an example has therefore the form:

δ_1 intensity$_1$;δ_2 intensity$_2$;.....;δ_i intensity$_i$;.....; δ_n intensity$_n$

The solvent in which the NMR spectrum was measured is written in squared brackets behind the example number and prior to the NMR-Peak list

Example No. I-1 [DMSO-D_6] 8.0055 16.00;7.3472 1.39;7.3429 1.89;7.3238 8.76;7.3048 10.15;7.1707 5.98;7.1567 3.82;7.1514 4.37;7.1317 3.60;7.0375 2.99;7.0210 8.97;7.0035 4.27;6.9848 2.03;6.8977 5.49;6.8852 3.32;5.8869 2.12;5.8691 2.50;5.8594 2.52;5.8413 2.24;5.4480 1.14;5.4048 4.22;5.3631 4.23;5.3208 1.12;4.8765 12.42;4.8706 12.41;4.3586 1.31;4.3257 1.38;3.9762 1.35;3.9425 1.47;3.8964 2.48;3.8686 2.86;3.8534 3.19;3.8257 2.87;3.7713 0.39;3.7658 0.37;3.7408 0.35;3.7236 0.39;3.6946 0.41;3.6901 0.44;3.6139 0.50;3.6009 0.57;3.5655 3.69;3.5596 7.65;3.5537 3.68;3.5269 0.74;3.5095 0.83;3.4837 1.00;3.4673 1.14;3.4479 1.33;3.4029 3.19;3.3743 6.16;3.3121 5148.85;3.2885 58.37;3.2715 8.09;3.2534 5.49;3.2284 4.06;3.2105 3.16;3.1748 0.37;2.8624 0.95;2.8325 1.66;2.8060 1.01;2.6952 0.56;2.6787 1.83;2.6741 3.46;2.6695 4.52;2.6649 3.37;2.6603 1.74;2.6277 0.54;2.5395 5.91;2.5227 18.48;2.5094 256.55;2.5050 482.43;2.5005 633.82;2.4960 435.65;2.4916 205.46;2.3364 1.51;2.3317 3.16;2.3272 4.18;2.3225 3.02;2.3179 1.43;2.1278 1.15;2.0948 2.38;2.0688 10.42;1.9078 0.32;1.8353 0.55;1.8047 1.09;1.7818 0.95;1.7727 0.92;1.7518 0.40;1.7445 0.38;1.5999 0.49;1.5800 1.01;1.5699 1.05;1.5486 1.04;1.5398 1.01;1.5191 0.45;1.2356 0.80;0.8904 0.61;0.0080 2.38;-0.0002 56.69;-0.0084 2.00
Example No. I-2 [DMSO-D_6] 9.9022 0.44;8.7772 0.50;8.6463 0.42;8.0130 16.00;7.7728 0.64;7.7581 0.33;7.7407 0.50;7.5929 0.52;7.3484 9.21;7.3313 4.39;7.3267 10.28;7.3088 3.30;7.2042 0.38;7.1754 7.08;7.1595 3.59;7.0421 3.74;7.0234 8.65;7.0126 11.26;7.0076 4.29;6.9955 3.95;6.9907 9.69;6.9573 0.62;6.9001 7.60;6.8876 4.10;5.7464 13.29;5.6954 2.45;5.6739 3.26;5.6688 2.96;5.6472 2.43;5.4524 1.52;5.4104 5.36;5.3688 5.44;5.3262 1.43;4.8008 14.95;4.7949 14.86;4.7407 0.94;4.3647 1.74;4.3317 1.80;4.0571 0.80;4.0392 2.27;4.0214 2.32;4.0037 1.21;3.9850 1.69;3.9517 1.80;3.8530 2.59;3.8260 2.95;3.8100 3.38;3.7831 2.88;3.5499 3.63;3.5440 7.26;3.5382 3.57;3.4766 0.33;3.4424 0.49;3.4165 1.72;3.4070 1.58;3.3895 5.58;3.3785 2.68;3.3685 4.75;3.3595 2.82;3.3469 4.70;3.3252 7.94;3.3047

416.16;3.2810 7.73;3.2426 1.41;3.0372 0.33;2.8752 1.34;2.8491 2.27;2.8170 1.23;2.6737 0.74;2.6693 1.21;2.6648 0.70;2.5390 1.68;2.5087 48.88;2.5045 86.78;2.5000 110.03;2.4957 76.72;2.3313 0.55;2.3268 0.72;2.3222 0.49;2.1375 1.59;2.1049 3.18;2.0691 2.49;1.9868 9.24;1.9080 0.66;1.8444 0.72;1.8229 1.38;1.8154 1.43;1.7920 1.34;1.7626 0.56;1.6213 0.60;1.6144 0.71;1.5938 1.36;1.5841 1.46;1.5630 1.36;1.5542 1.28;1.5340 0.60;1.2366 0.62;1.1927 2.59;1.1749 5.02;1.1571 2.49;-0.0002 5.18
Example No. I-3 [DMSO-D_6] 8.0183 1.38;7.3327 0.53;7.1725 0.58;7.0218 0.70;7.0082 0.35;6.9906 0.80;6.8999 0.59;6.8859 0.33;5.7441 7.03;5.4070 0.43;5.3656 0.46;4.8067 1.20;4.8008 1.20;4.3506 0.38;4.3380 0.69;4.3252 0.44;4.0903 0.34;4.0772 0.36;4.0572 1.22;4.0394 3.66;4.0216 3.70;4.0038 1.27;3.5397 0.39;3.5338 0.72;3.5281 0.38;3.4750 0.33;3.4622 0.37;3.4575 0.64;3.4448 0.70;3.4401 0.74;3.4273 0.79;3.4226 0.61;3.4098 0.68;3.3964 1.04;3.3757 1.59;3.3299 662.84;3.3068 6.66;3.1773 1.22;3.1642 1.18;2.6708 0.41;2.5408 0.57;2.5240 1.51;2.5106 21.47;2.5063 40.33;2.5018 52.87;2.4974 36.58;2.4930 17.42;2.4636 0.33;2.4454 0.49;2.4280 0.46;2.3285 0.36;2.0685 0.90;1.9869 16.00;1.1930 4.40;1.1752 8.70;1.1574 4.29;1.0748 0.93;1.0572 1.77;1.0398 0.88;0.9521 1.12;0.9343 2.20;0.9165 1.07;-0.0002 0.67
Example No. I-5 [DMSO-D_6] 7.9681 16.00;7.4330 1.50;7.4160 1.98;7.4119 3.10;7.3952 3.13;7.3910 1.89;7.3739 1.51;7.3085 2.56;7.1750 5.80;7.1585 2.74;7.0418 2.83;7.0226 6.92;7.0121 4.36;6.9908 3.84;6.9093 3.01;6.9008 5.87;6.8865 5.33;6.8644 1.87;6.0740 1.94;6.0516 2.36;6.0436 2.19;6.0213 1.96;5.4545 1.14;5.4110 4.19;5.3690 4.16;5.3271 1.09;4.8870 0.53;4.8816 0.59;4.8472 6.66;4.8417 10.99;4.8361 6.08;4.8020 0.48;4.7962 0.58;4.3673 1.31;4.3338 1.42;3.9904 1.39;3.9536 1.47;3.8311 0.43;3.8095 1.58;3.7769 1.77;3.7681 2.13;3.7375 1.93;3.5278 3.35;3.5207 4.59;3.5148 8.43;3.5088 5.00;3.4848 3.01;3.4631 3.39;3.3942 7.50;3.3307 5101.71;3.3077 39.28;3.2505 2.33;3.2140 0.93;3.1513 0.33;2.8803 0.83;2.8505 1.57;2.8219 0.84;2.6753 1.19;2.6708 1.61;2.6661 1.17;2.6613 0.59;2.5407 2.04;2.5107 94.07;2.5063 176.46;2.5017 231.85;2.4973 160.85;2.4929 77.91;2.3331 1.24;2.3283 1.57;2.1548 1.15;2.1171 2.28;2.0796 1.44;2.0684 11.58;1.8497 0.53;1.8211 1.07;1.7995 1.06;1.6243 0.49;1.5944 1.06;1.5722 1.05;1.5414 0.42;1.2375 0.37;-0.0002 12.57
Example No. I-6 [DMSO-D_6] 7.9699 10.61;7.4071 2.41;7.3934 4.66;7.3796 3.07;7.2752 1.62;7.1866 3.78;7.1592 4.04;7.1538 4.69;7.1452 3.55;7.1404 4.18;7.1317 1.81;7.0981 1.82;7.0412 4.24;6.9510 1.99;6.9167 4.54;6.2241 1.96;6.2077 2.40;6.2036 2.22;6.1871 1.98;5.7656 16.00;5.4603 1.61;5.4319 3.45;5.3819 3.39;5.3536 1.59;4.8286 0.82;4.8247 0.79;4.8020 3.81;4.7981 3.85;4.7899 3.79;4.7861 3.61;4.7633 0.81;4.7594 0.80;4.3670 1.08;4.3451 1.11;4.0452 0.51;4.0334 1.53;4.0215 1.55;4.0097 0.53;3.9852 1.04;3.9628 1.11;3.7541 1.50;3.7334 1.91;3.7262 2.29;3.7056 1.88;3.5693 2.07;3.5530 2.10;3.5414 1.63;3.5251 1.59;3.4631 2.42;3.4592 4.73;3.4554 2.22;3.4198 0.46;3.4137 0.81;3.4074 0.57;3.4008 0.99;3.3946 1.65;3.3883 1.06;3.3754 1.57;3.3523 274.08;3.3299 1.08;3.2952 0.77;3.2912 0.87;3.2716 1.51;3.2523 0.85;3.2486 0.70;2.8618 0.76;2.8431 1.38;2.8236 0.77;2.6180 0.64;2.6151 0.84;2.6121 0.61;2.5428 0.39;2.5241 2.50;2.5211 3.45;2.5062 103.50;2.5033 133.72;2.5004 96.81;2.3904 0.69;2.3875 0.88;2.3846 0.64;2.1497 0.99;2.1296 1.16;2.1078 1.06;2.0877 1.09;2.0787 0.92;1.9906 6.59;1.8398 0.37;1.8207 0.88;1.8017 0.83;1.6093 0.33;1.6029 0.39;1.5892 0.87;1.5828 0.90;1.5688 0.88;1.5627 0.83;1.5490 0.35;1.1858 1.79;1.1740 3.53;1.1622 1.75;0.0051 0.44;-0.0002 8.35
Example No. I-8 [DMSO-D_6] 8.2694 0.37;8.0297 16.00;7.9423 0.34;7.3091 2.84;7.1813 6.20;7.1772 11.27;7.1662 10.80;7.1624 8.45;7.0958 2.91;7.0732 3.19;7.0426 3.23;7.0294 7.49;6.9051 6.34;6.8935 3.90;5.8645 2.29;5.8471 2.58;5.8369 2.65;5.8193 2.37;5.4555 1.50;5.4132 5.05;5.3703 4.97;5.3273 1.58;4.8808 13.15;4.8749 13.81;4.3601 1.47;4.3275 1.57;3.9771 1.37;3.9407 1.52;3.9294 2.96;3.9015 2.87;3.8861 3.23;3.8584 2.64;3.6039 2.94;3.5981 6.75;3.5921 3.20;3.4144 0.70;3.4048 1.16;3.3952 0.96;3.3853 1.40;3.3759 2.57;3.3666 1.96;3.3337 316.84;3.3303 523.70;3.3286 460.30;3.3252 593.19;3.2919 6.64;3.2742 4.45;3.2582 2.69;3.2487 4.11;3.2310 4.04;3.1993 0.56;3.1490 0.35;3.1246 0.33;2.8581 1.12;2.8268 1.93;2.7999 1.08;2.6796 0.53;2.6753 1.26;2.6707 1.76;2.6660 1.35;2.5409 1.12;2.5240 3.16;2.5106 90.30;2.5061 191.47;2.5015 264.57;2.4969 200.78;2.4925 103.79;2.3329 1.42;2.3283 1.93;2.3238 1.50;2.1244 1.34;2.0912 2.76;2.0736 13.65;2.0591 1.66;1.8417 0.52;1.8317 0.61;1.8123 1.21;1.8025 1.29;1.7812 1.18;1.7728 1.17;1.7501 0.51;1.6054 0.50;1.5955 0.62;1.5739 1.21;1.5645 1.36;1.5442 1.21;1.5343 1.19;1.5136 0.52;1.5038 0.44;1.2353 0.90;0.1460 0.45;0.0081 3.18;-

0.0002 106.36;-0.0084 5.20;-0.1499 0.45
Example No. I-9 [DMSO-D_6] 9.7648 0.40;7.9977 5.78;7.9717 0.36;7.3105 1.24;7.2239 2.35;7.2028 2.50;7.1771 2.83;7.1657 1.46;7.0442 1.45;7.0299 3.16;6.9057 3.58;6.8943 1.72;6.7107 2.56;6.7047 2.70;6.5880 1.61;6.5824 1.35;6.5667 1.43;6.5612 1.25;5.8121 0.94;5.7933 1.12;5.7844 1.16;5.7656 1.11;5.4587 0.72;5.4144 2.49;5.3719 2.50;5.3292 0.88;4.8596 4.64;4.8539 4.69;4.3610 0.80;4.3280 0.83;4.0557 0.50;4.0382 1.43;4.0203 1.50;4.0018 0.54;3.9815 0.81;3.9460 0.83;3.8409 0.48;3.8294 0.40;3.8150 0.97;3.7878 1.26;3.7721 1.29;3.7534 16.00;3.6856 1.58;3.5763 1.35;3.5708 2.96;3.4146 0.49;3.4061 0.72;3.3766 1.59;3.3657 1.55;3.3367 262.16;3.3302 692.11;3.2913 1.36;3.2802 1.61;3.2608 2.29;3.2369 1.33;3.2187 1.11;2.8610 0.54;2.8343 1.02;2.8008 0.58;2.7985 0.47;2.6712 1.05;2.5415 0.45;2.5018 180.11;2.3285 1.07;2.1308 0.74;2.0978 1.42;2.0732 1.60;2.0602 0.78;1.9885 5.87;1.8153 0.67;1.8089 0.69;1.7838 0.61;1.7769 0.59;1.5781 0.62;1.5699 0.66;1.5476 0.66;1.5404 0.57;1.3973 0.52;1.2589 0.38;1.2367 0.91;1.1923 1.51;1.1746 2.97;1.1568 1.53;0.8684 0.36;0.8490 0.45;0.8303 0.33;-0.0002 10.43
Example No. I-10 [DMSO-D_6] 8.8000 0.35;8.0314 16.00;8.0258 0.56;7.3002 1.37;7.2954 1.51;7.2887 1.57;7.2839 2.00;7.2810 1.63;7.2724 3.50;7.2647 1.91;7.2587 0.45;7.1955 0.88;7.1824 8.23;7.1755 8.85;7.1706 6.38;7.1683 4.98;7.1624 1.02;7.1294 2.47;7.0939 2.49;7.0390 6.09;6.9487 2.81;6.9145 5.99;5.9825 2.63;5.9702 2.96;5.9639 2.84;5.9516 2.64;5.4543 2.00;5.4259 4.37;5.3764 4.54;5.3480 2.07;4.8469 12.91;4.8429 12.80;4.3581 1.42;4.3361 1.43;4.0454 0.68;4.0335 1.99;4.0217 2.00;4.0099 0.69;3.9754 1.36;3.9469 3.25;3.9281 2.81;3.9181 2.98;3.8995 2.46;3.6563 3.62;3.6524 7.40;3.6484 3.44;3.4078 1.31;3.4019 1.98;3.3887 2.94;3.3825 4.59;3.3761 5.15;3.3509 1174.43;3.3311 6.48;3.3273 18.77;3.3192 3.56;3.3068 0.53;3.2844 1.13;3.2807 1.28;3.2611 2.01;3.2418 1.16;3.1708 0.76;3.1622 0.74;2.8500 1.05;2.8299 1.79;2.8120 1.06;2.6180 1.96;2.6150 2.59;2.6120 1.91;2.6091 0.99;2.5427 2.69;2.5242 8.11;2.5211 10.12;2.5179 11.89;2.5091 139.51;2.5062 280.13;2.5032 371.18;2.5002 269.11;2.4973 124.42;2.3933 0.95;2.3904 1.85;2.3874 2.43;2.3844 1.74;2.1262 1.29;2.1054 1.53;2.0868 1.43;2.0782 5.17;2.0671 1.39;1.9905 8.79;1.8320 0.51;1.8253 0.60;1.8114 1.17;1.8053 1.27;1.7905 1.21;1.7847 1.11;1.7707 0.52;1.7643 0.41;1.5910 0.47;1.5847 0.57;1.5708 1.17;1.5644 1.23;1.5504 1.20;1.5442 1.11;1.5301 0.49;1.5239 0.41;1.3969 3.62;1.2337 1.97;1.1860 2.41;1.1741 4.71;1.1623 2.36;0.8535 0.32;0.0966 0.33;0.0052 3.55;-0.0002 79.84;-0.0057 2.64

NMR Peak list method, further details

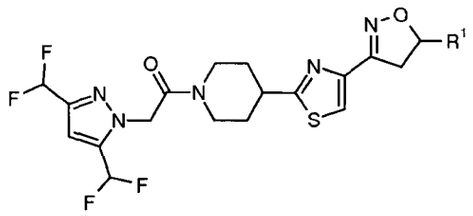
Further details of NMR-data description with peak lists you find in the publication „ Citation of NMR Peaklist Data within Patent Applications ":

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Patent Claims

1. Combinations comprising:

(A) at least one thiazolylisoxazoline of formula **(I)**



(I)

in which

R^1 represents phenyl, which is at least substituted with one prop-2-yn-1-yloxy and optionally be additionally substituted by one, two or three substituents selected from the group consisting of methyl, methoxy, fluoro or chloro or an agrochemically acceptable salt thereof,

and

(B) at least one further active compound selected from the following groups

inhibitors of the ergosterol synthesis,
inhibitors of the respiratory chain at complex I or II,
inhibitors of the respiratory chain at complex III,
inhibitors of the mitosis and cell division,
compounds capable of having a multisite action,
compounds capable of inducing a host defense,
inhibitors of the amino acid and/or protein biosynthesis,
inhibitors of the ATP production,
inhibitors of the cell wall synthesis,
inhibitors of the lipid and membrane synthesis,
inhibitors of the melanine biosynthesis,
inhibitors of the nucleic acid synthesis,
inhibitors of the signal transduction,
compounds capable of acting as uncoupler,
other fungicides.

2. Combinations according to claim 1 comprising at least one compound of the formula (I) selected from the group consisting of

(I-1) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-2) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[4-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-3) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[3-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-4) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2,6-difluoro-4-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-5) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-fluoro-6-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-6) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-chloro-6-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-7) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2,6-difluoro-3-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-8) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[5-fluoro-2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-9) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[4-methoxy-2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-10) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[3-fluoro-2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,.

3. Combinations according to claim 1 comprising at least one further active compound (B) selected from the following groups:

(2.1) bixafen, (2.2) boscalid, (2.6) fluopyram, (2.8) fluxapyroxad, (2.11) isopyrazam (mixture of syn-epimeric racemate 1RS,4SR,9RS and anti-epimeric racemate 1RS,4SR,9SR), (2.12) isopyrazam (anti-epimeric racemate 1RS,4SR,9SR), (2.13) isopyrazam (anti-epimeric enantiomer 1R,4S,9S), (2.14) isopyrazam (anti-epimeric enantiomer 1S,4R,9R), (2.15) isopyrazam (syn epimeric racemate 1RS,4SR,9RS), (2.16) isopyrazam (syn-epimeric enantiomer 1R,4S,9R), (2.17) isopyrazam (syn-epimeric enantiomer 1S,4R,9S), (2.27) N-[1-(2,4-dichlorophenyl)-1-methoxypropan-2-yl]-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide, (2.29) N-[9-(dichloromethylene)-1,2,3,4-tetrahydro-1,4-methanonaphthalen-5-yl]-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide, (3.1) ametoctradin, (3.2) amisulbrom, (3.3) azoxystrobin, (3.4) cyazofamid, (3.9) famoxadone, (3.10) fenamidone, (3.12) fluoxastrobin, (3.16) picoxystrobin, (3.17) pyraclostrobin, (3.22) trifloxystrobin, (4.6) fluopicolide, (5.1) bordeaux mixture, (5.4) chlorothalonil, (5.5) copper hydroxide, (5.7) copper oxide, (5.8) copper oxychloride, (5.9) copper(2+) sulfate, (5.16) folpet, (5.23) mancozeb, (5.25) metiram, (5.26) metiram zinc, (5.29) propineb, (5.30) sulphur and sulphur preparations

including calcium polysulphide, (7.7) pyrimethanil, (9.2) dimethomorph, (9.4) iprovalicarb, (9.5) mandipropamid, (10.9) propamocarb, (10.10) propamocarb hydrochloride, (12.9) metalaxyl, (12.10) metalaxyl-M (mefenoxam), (14.4) fluazinam, (15.9) cymoxanil, (15.24) fosetyl-aluminium, (15.25) fosetyl-calcium, (15.26) fosetyl-sodium, (15.41) phosphorous acid and its salts, (15.42) propamocarb-fosetylate, (15.54) 1-(4-{4-[(5R)-5-(2,6-difluorophenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)-2-[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]ethanone, (15.55) 1-(4-{4-[(5S)-5-(2,6-difluorophenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)-2-[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]ethanone, (15.56) 1-(4-{4-[5-(2,6-difluorophenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)-2-[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]ethanone, (15.60) 2,6-dimethyl-1H,5H-[1,4]dithiino[2,3-c:5,6-c']dipyrrole-1,3,5,7(2H,6H)-tetrone, (15.90) pentyl {6-[({[(1-methyl-1H-tetrazol-5-yl)(phenyl)methylidene]amino}oxy)methyl]pyridin-2-yl}carbamate.

4. Combination according to claims 1 to 3 comprising mixing partners (A):(B) in a weight ratio of 1:100 to 100:1.

5. Compositions comprising active compound combinations according to Claim 1, 2, 3 or 4 and further comprising auxiliaries, solvents, carriers, surfactant or extenders.

6. Method for controlling phytopathogenic fungi in crop protection, characterized in that active compound combinations according to Claim 1, 2, 3 or 4 or compositions according to Claim 5 are applied to the seed, the plant, to fruits of plants or to the soil on which the plant grows or is supposed to grow.

7. Method according to Claim 06, characterized in that the plant, the fruits of plants or the soil on which the plant grows or is intended to grow are treated.

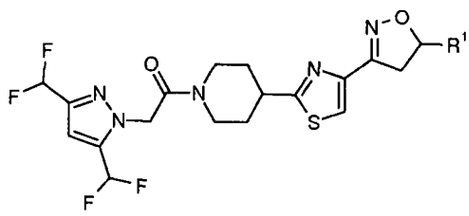
8. Method according to Claim 06, characterized in that in the treatment of leaves from 0.1 to 10 000 g/ha and in the treatment of seed from 2 to 200 g per 100 kg of seed are employed.

9. Use of active compound combinations according to Claim 1, 2, 3 or 4 or of compositions according to Claim 5 for controlling unwanted phytopathogenic fungi in crop protection.

10. Use of active compound combinations according to Claim or of compositions according to Claim 5 for treating seed, seed of transgenic plants and transgenic plants.

11. Seed treated with active compound combinations according to Claim 1, 2, 3 or 4 or with compositions according to Claim 5.

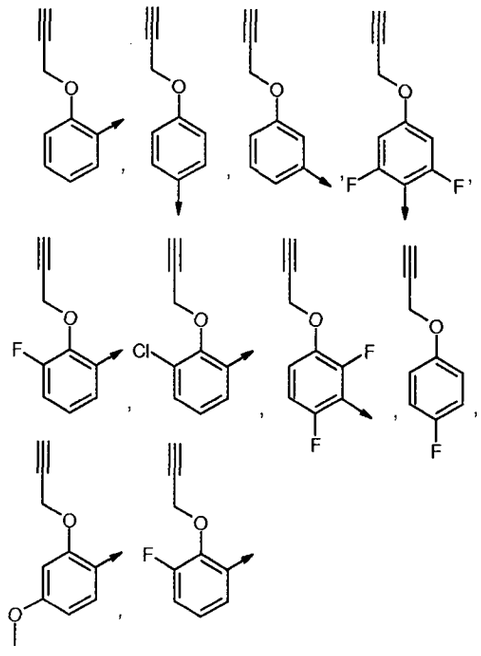
12. Thiazolylisoxazoline of formula **(I)**



(I)

in which

R^1 is



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Active compound combinations

Abstract

The present invention relates to active compound combinations, in particular within a fungicide composition, which comprises (A) a thiazolylisoxazoline of formula (I) and a further fungicidally active compound (B). Moreover, the invention relates to a method for curatively or preventively controlling the phytopathogenic fungi of plants or crops, to the use of a combination according to the invention for the treatment of seed, to a method for protecting a seed and not at least to the treated seed.

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WIPO
WORLD
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APPLICATION NUMBER: ***61/494,105***
FILING DATE: ***June 07, 2011***

THE COUNTRY CODE AND NUMBER OF YOUR PRIORITY APPLICATION, TO BE USED FOR FILING ABROAD UNDER THE PARIS CONVENTION, IS ***US61/494,105***

By Authority of the
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Electronic Acknowledgement Receipt

EFS ID:	10249864
Application Number:	61494105
International Application Number:	
Confirmation Number:	1704
Title of Invention:	Active Compound Combinations
First Named Inventor/Applicant Name:	Sebastian Hoffmann
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Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Provisional Cover Sheet (SB16)	113034ProvAppCoverSheet6-7-11.pdf	1060172 b660d4d929e87a4db9f6d94d8db7c6bf7f6e1448	no	3
Warnings:					
Information:					
2		113034Application.pdf	345290 040eb698cd8c5ab6ab027f5a04b4b445a6cfb5e5	yes	74
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Specification		1	69	
	Claims		70	73	
	Abstract		74	74	
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	29295 f3b2ba06e77343df1fee8d97ceb1d237501314db	no	2
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		Total Files Size (in bytes):	1434757		

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National Stage of an International Application under 35 U.S.C. 371

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New International Application Filed with the USPTO as a Receiving Office

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Doc Code: **TR.PROV**
Document Description: Provisional Cover Sheet (SB16)

PTO/SB/16 (11-08)
Approved for use through 09/30/2010 OMB 0651-0032
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
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Provisional Application for Patent Cover Sheet

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53(c)

Inventor(s)

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All Inventors Must Be Listed – Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. — Add

Title of Invention	Active Compound Combinations
Attorney Docket Number (if applicable)	BCS11-3034

Correspondence Address

Direct all correspondence to (select one):

◉ The address corresponding to Customer Number	○ Firm or Individual Name
Customer Number	34469

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

◉ No.

○ Yes, the name of the U.S. Government agency and the Government contract number are:

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Doc Code: **TR.PROV**
Document Description: Provisional Cover Sheet (SB16)

PTO/SB/16 (11-08)
Approved for use through 08/30/2010 OMB 0651-0032
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
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Entity Status

Applicant claims small entity status under 37 CFR 1.27

○ Yes, applicant qualifies for small entity status under 37 CFR 1.27

◉ No

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Signature

Please see 37 CFR 1.4(d) for the form of the signature.

Signature	/destiny m. davenport/			Date (YYYY-MM-DD)	2011-06-07
First Name	Destiny M.	Last Name	Davenport	Registration Number (If appropriate)	60360

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Active compound combinations

The present invention relates to active compound combinations, in particular within a fungicide composition, which comprises (A) a thiazolylisoxazoline of formula (I) and a further fungicidally active compound (B). Moreover, the invention relates to a method for curatively or preventively controlling the phytopathogenic fungi of plants or crops, to the use of a combination according to the invention for the treatment of seed, to a method for protecting a seed and not at least to the treated seed.

It is already known that certain thiazolylisoxazolines can be used as fungicides (see WO08/013925, WO WO09/094407, WO09/094445, WO09/055514 and PCT/EP2010/070156).

Since the environmental and economic requirements imposed on modern-day crop protection compositions are continually increasing, with regard, for example, to the spectrum of action, toxicity, selectivity, application rate, formation of residues, and favourable preparation ability, and since, furthermore, there may be problems, for example, with resistances, a constant task is to develop new compositions, in particular fungicidal agents, which in some areas at least help to fulfil the abovementioned requirements.

The present invention provides active compound combinations/compositions which in some aspects at least achieve the stated objective.

It has now been found, surprisingly, that the combinations according to the invention not only bring about the additive enhancement of the spectrum of action with respect to the phytopathogen to be controlled that was in principle to be expected but achieves a synergistic effect which extends the range of action of the component (A) and of the component (B) in two ways. Firstly, the rates of application of the component (A) and of the component (B) are lowered whilst the action remains equally good. Secondly, the combination still achieves a high degree of phytopathogen control even where the two individual compounds have become totally ineffective in such a low application rate range. This allows, on the one hand, a substantial broadening of the spectrum of phytopathogens that can be controlled and, on the other hand, increased safety in use.

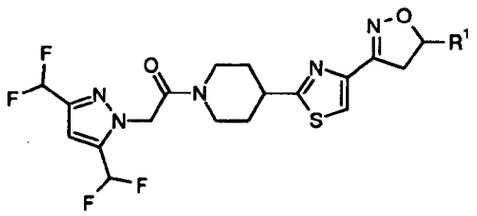
In addition to the fungicidal synergistic activity, the active compound combinations according to the invention have further surprising properties which, in a wider sense, may also be called synergistic, such as, for example: broadening of the activity spectrum to other phytopathogens, for example to resistant strains of plant diseases; lower application rates of the active compounds; sufficient control of pests with the aid of the active compound combinations according to the invention even at application rates where the individual compounds show no or virtually no activity; advantageous behaviour during formulation or during use, for example during grinding,

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sieving, emulsifying, dissolving or dispensing; improved storage stability and light stability; advantageous residue formation; improved toxicological or ecotoxicological behaviour; improved properties of the plant, for example better growth, increased harvest yields, a better developed root system, a larger leaf area, greener leaves, stronger shoots, less seed required, lower phytotoxicity, mobilization of the defence system of the plant, good compatibility with plants. Thus, the use of the active compound combinations or compositions according to the invention contributes considerably to keeping young cereal stands healthy, which increases, for example, the winter survival of the cereal seed treated, and also safeguards quality and yield. Moreover, the active compound combinations according to the invention may contribute to enhanced systemic action. Even if the individual compounds of the combination have no sufficient systemic properties, the active compound combinations according to the invention may still have this property. In a similar manner, the active compound combinations according to the invention may result in higher persistency of the fungicidal action.

Accordingly, the present invention provides a combination comprising:

(A) at least one thiazolylisoxazoline of formula (I)



(I)

in which

R^1 represents phenyl, which is at least substituted with one prop-2-yn-1-yloxy and optionally be additionally substituted by one, two or three substituents selected from the groups consisting of methyl, methoxy, fluoro or chloro

or an agrochemically acceptable salt thereof,

and

(B) at least one further active compound selected from the following groups

(1) inhibitors of the ergosterol synthesis,

(2) inhibitors of the respiratory chain at complex I or II,

(3) inhibitors of the respiratory chain at complex III,

(4) inhibitors of the mitosis and cell division,

(5) compounds capable of having a multisite action,

(6) compounds capable of inducing a host defense,

(7) inhibitors of the amino acid and/or protein biosynthesis,

(8) inhibitors of the ATP production,

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(9) inhibitors of the cell wall synthesis,

(10) inhibitors of the lipid and membrane synthesis,

(11) inhibitors of the melanine biosynthesis,

(12) inhibitors of the nucleic acid synthesis,

(13) inhibitors of the signal transduction,

(14) compounds capable of acting as uncoupler,

(15) other fungicides.

Preference is given to combinations comprising at least one compound of the formula (I) selected from the group consisting of

(I-1) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-2) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[4-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-3) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[3-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-4) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2,6-difluoro-4-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-5) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-fluoro-6-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-6) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-chloro-6-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-7) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2,6-difluoro-3-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

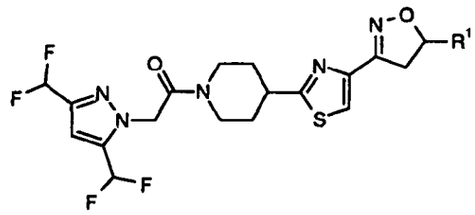
(I-8) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[5-fluoro-2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-9) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[4-methoxy-2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

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(I-10) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[3-fluoro-2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone.

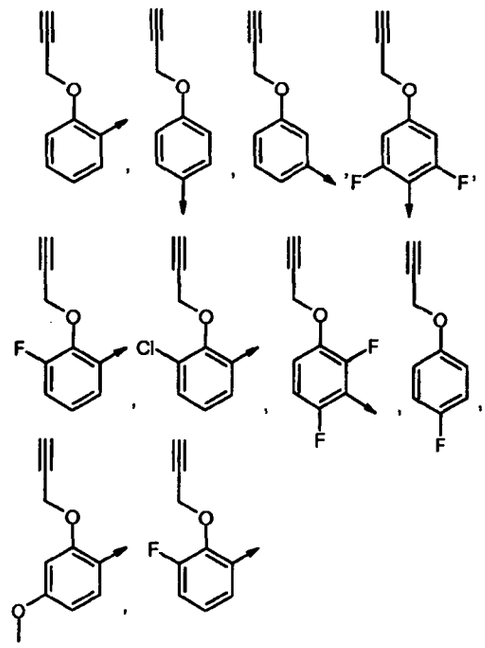
The present invention is also directed to thiazolylisoxazoline of formula (I)



(I)

in which

R^1 is



Thiazolylisoxazoline of formula (I) according to the present invention are:

(I-1) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-2) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[4-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

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(I-3) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[3-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-4) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2,6-difluoro-4-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-5) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-fluoro-6-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-6) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-chloro-6-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-7) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2,6-difluoro-3-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-8) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[5-fluoro-2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-9) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[4-methoxy-2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-10) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[3-fluoro-2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone.

In the description below numbers in parenthesis behind a compound name represent the CAS Registry No. of said compound.

Preference is further given to combinations comprising at least one further active compound (B) selected from the following groups:

(1) Inhibitors of the ergosterol biosynthesis, for example (1.1) aldimorph (1704-28-5), (1.2) azaconazole (60207-31-0), (1.3) bitertanol (55179-31-2), (1.4) bromuconazole (116255-48-2), (1.5) cyproconazole (113096-99-4), (1.6) diclobutrazole (75736-33-3), (1.7) difenoconazole (119446-68-3), (1.8) diniconazole (83657-24-3), (1.9) diniconazole-M (83657-18-5), (1.10) dodemorph (1593-77-7), (1.11) dodemorph acetate (31717-87-0), (1.12) epoxiconazole (106325-08-0), (1.13) etaconazole (60207-93-4), (1.14) fenarimol (60168-88-9), (1.15) fenbuconazole (114369-43-6), (1.16) fenhexamid (126833-17-8), (1.17) fenpropidin (67306-00-7), (1.18) fenpropimorph (67306-03-0), (1.19) fluquinconazole (136426-54-5), (1.20) flurprimi-

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dol (56425-91-3), (1.21) flusilazole (85509-19-9), (1.22) flutriafol (76674-21-0), (1.23) furconazole (112839-33-5), (1.24) furconazole-cis (112839-32-4), (1.25) hexaconazole (79983-71-4), (1.26) imazalil (60534-80-7), (1.27) imazalil sulfate (58594-72-2), (1.28) imibenconazole (86598-92-7), (1.29) ipconazole (125225-28-7), (1.30) metconazole (125116-23-6), (1.31) myclobutanil (88671-89-0), (1.32) naftifine (65472-88-0), (1.33) nuarimol (63284-71-9), (1.34) oxpoconazole (174212-12-5), (1.35) paclobutrazol (76738-62-0), (1.36) pefurazoate (101903-30-4), (1.37) penconazole (66246-88-6), (1.38) piperalin (3478-94-2), (1.39) prochloraz (67747-09-5), (1.40) propiconazole (60207-90-1), (1.41) prothioconazole (178928-70-6), (1.42) pyributicarb (88678-67-5), (1.43) pyrifenox (88283-41-4), (1.44) quinconazole (103970-75-8), (1.45) simeconazole (149508-90-7), (1.46) spiroxamine (118134-30-8), (1.47) tebuconazole (107534-96-3), (1.48) terbinafine (91161-71-6), (1.49) tetraconazole (112281-77-3), (1.50) triadimefon (43121-43-3), (1.51) triadimenol (89482-17-7), (1.52) tridemorph (81412-43-3), (1.53) triflumizole (68694-11-1), (1.54) triforine (26644-46-2), (1.55) triticonazole (131983-72-7), (1.56) uniconazole (83657-22-1), (1.57) uniconazole-p (83657-17-4), (1.58) viniconazole (77174-66-4), (1.59) voriconazole (137234-62-9), (1.60) 1-(4-chlorophenyl)-2-(1H-1,2,4-triazol-1-yl)cycloheptanol (129586-32-9), (1.61) methyl 1-(2,2-dimethyl-2,3-dihydro-1H-inden-1-yl)-1H-imidazole-5-carboxylate (110323-95-0), (1.62) N'-{5-(difluoromethyl)-2-methyl-4-[3-(trimethylsilyl)propoxy]phenyl}-N-ethyl-N-methylimidoformamide, (1.63) N-ethyl-N-methyl-N'-{2-methyl-5-(trifluoromethyl)-4-[3-(trimethylsilyl)propoxy]phenyl}imidoformamide and (1.64) O-[1-(4-methoxyphenoxy)-3,3-dimethylbutan-2-yl] 1H-imidazole-1-carbothioate (111226-71-2).

(2) inhibitors of the respiratory chain at complex I or II, for example (2.1) bixafen (581809-46-3), (2.2) boscalid (188425-85-6), (2.3) carboxin (5234-68-4), (2.4) diflumetorim (130339-07-0), (2.5) fenfuram (24691-80-3), (2.6) fluopyram (658066-35-4), (2.7) flutolanil (66332-96-5), (2.8) fluxapyroxad (907204-31-3), (2.9) furametpyr (123572-88-3), (2.10) furmecyclox (60568-05-0), (2.11) isopyrazam (mixture of syn-epimeric racemate 1RS,4SR,9RS and anti-epimeric racemate 1RS,4SR,9SR) (881685-58-1), (2.12) isopyrazam (anti-epimeric racemate 1RS,4SR,9SR), (2.13) isopyrazam (anti-epimeric enantiomer 1R,4S,9S), (2.14) isopyrazam (anti-epimeric enantiomer 1S,4R,9R), (2.15) isopyrazam (syn epimeric racemate 1RS,4SR,9RS), (2.16) isopyrazam (syn-epimeric enantiomer 1R,4S,9R), (2.17) isopyrazam (syn-epimeric enantiomer 1S,4R,9S), (2.18) mepronil (55814-41-0), (2.19) oxycarboxin (5259-88-1), (2.20) penflufen (494793-67-8), (2.21) penthiopyrad (183675-82-3), (2.22) sedaxane (874967-67-6), (2.23) thifluzamide (130000-40-7), (2.24) 1-methyl-N-[2-(1,1,2,2-tetrafluoroethoxy)phenyl]-3-(trifluoromethyl)-1H-pyrazole-4-carboxamide, (2.25) 3-(difluoromethyl)-1-methyl-N-[2-(1,1,2,2-tetrafluoroethoxy)phenyl]-1H-pyrazole-4-carboxamide, (2.26) 3-(difluoromethyl)-N-[4-fluoro-2-(1,1,2,3,3,3-hexafluoropropoxy)phenyl]-1-methyl-1H-pyrazole-4-carboxamide, (2.27) N-[1-(2,4-dichlorophenyl)-1-methoxypropan-2-yl]-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide (1092400-95-7) (WO 2008148570), (2.28) 5,8-

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difluoro-N-[2-(2-fluoro-4-{[4-(trifluoromethyl)pyridin-2-yl]oxy}phenyl)ethyl]quinazolin-4-amine (1210070-84-0) (WO2010025451) (2.29) N-[9-(dichloromethylene)-1,2,3,4-tetrahydro-1,4-methanonaphthalen-5-yl]-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide, (2.30) N-[(1S,4R)-9-(dichloromethylene)-1,2,3,4-tetrahydro-1,4-methanonaphthalen-5-yl]-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide and (2.31) N-[(1R,4S)-9-(dichloromethylene)-1,2,3,4-tetrahydro-1,4-methanonaphthalen-5-yl]-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide.

(3) inhibitors of the respiratory chain at complex III, for example (3.1) ametoctradin (865318-97-4), (3.2) amisulbrom (348635-87-0), (3.3) azoxystrobin (131860-33-8), (3.4) cyazofamid (120116-88-3), (3.5) coumethoxystrobin (850881-30-0), (3.6) coumoxystrobin (850881-70-8), (3.7) dimoxystrobin (141600-52-4), (3.8) enestroburin (238410-11-2) (WO 2004/058723), (3.9) famoxadone (131807-57-3) (WO 2004/058723), (3.10) fenamidone (161326-34-7) (WO 2004/058723), (3.11) fenoxystrobin (918162-02-4), (3.12) fluoxastrobin (361377-29-9) (WO 2004/058723), (3.13) kresoxim-methyl (143390-89-0) (WO 2004/058723), (3.14) metominostrobin (133408-50-1) (WO 2004/058723), (3.15) orysastrobin (189892-69-1) (WO 2004/058723), (3.16) picoxystrobin (117428-22-5) (WO 2004/058723), (3.17) pyraclostrobin (175013-18-0) (WO 2004/058723), (3.18) pyrametostrobin (915410-70-7) (WO 2004/058723), (3.19) pyraoxystrobin (862588-11-2) (WO 2004/058723), (3.20) pyribencarb (799247-52-2) (WO 2004/058723), (3.21) triclopyricarb (902760-40-1), (3.22) trifloxystrobin (141517-21-7) (WO 2004/058723), (3.23) (2E)-2-(2-{[6-(3-chloro-2-methylphenoxy)-5-fluoropyrimidin-4-yl]oxy}phenyl)-2-(methoxyimino)-N-methylethanamide (WO 2004/058723), (3.24) (2E)-2-(methoxyimino)-N-methyl-2-(2-{[({(1E)-1-[3-(trifluoromethyl)phenyl]ethylidene}amino)oxy]methyl}phenyl)ethanamide (WO 2004/058723), (3.25) (2E)-2-(methoxyimino)-N-methyl-2-{2-[(E)-({1-[3-(trifluoromethyl)phenyl]ethoxy}imino)methyl]phenyl}ethanamide (158169-73-4), (3.26) (2E)-2-{2-[({[(1E)-1-(3-{[(E)-1-fluoro-2-phenylethenyl]oxy}phenyl)ethylidene]amino}oxy)methyl]phenyl}-2-(methoxyimino)-N-methylethanamide (326896-28-0), (3.27) (2E)-2-{2-[({[(2E,3E)-4-(2,6-dichlorophenyl)but-3-en-2-ylidene]amino}oxy)methyl]phenyl}-2-(methoxyimino)-N-methylethanamide, (3.28) 2-chloro-N-(1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl)pyridine-3-carboxamide (119899-14-8), (3.29) 5-methoxy-2-methyl-4-(2-{[({(1E)-1-[3-(trifluoromethyl)phenyl]ethylidene}amino)oxy]-methyl}phenyl)-2,4-dihydro-3H-1,2,4-triazol-3-one, (3.30) methyl (2E)-2-{2-[({cyclopropyl[(4-methoxyphenyl)imino]methyl}sulfanyl)methyl]phenyl}-3-methoxyprop-2-enoate (149601-03-6), (3.31) N-(3-ethyl-3,5,5-trimethylcyclohexyl)-3-(formylamino)-2-hydroxybenzamide (226551-21-9), (3.32) 2-{2-[(2,5-dimethylphenoxy)methyl]phenyl}-2-methoxy-N-methylacetamide (173662-97-0) and (3.33) (2R)-2-{2-[(2,5-dimethylphenoxy)methyl]phenyl}-2-methoxy-N-methylacetamide (394657-24-0).

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(4) Inhibitors of the mitosis and cell division, for example (4.1) benomyl (17804-35-2), (4.2) carbendazim (10605-21-7), (4.3) chlorfenazole (3574-96-7), (4.4) diethofencarb (87130-20-9), (4.5) ethaboxam (162650-77-3), (4.6) fluopicolide (239110-15-7), (4.7) fuberidazole (3878-19-1), (4.8) pencycuron (66063-05-6), (4.9) thiabendazole (148-79-8), (4.10) thiophanate-methyl (23564-05-8), (4.11) thiophanate (23564-06-9), (4.12) zoxamide (156052-68-5), (4.13) 5-chloro-7-(4-methylpiperidin-1-yl)-6-(2,4,6-trifluorophenyl)[1,2,4]triazolo[1,5-a]pyrimidine (214706-53-3) and (4.14) 3-chloro-5-(6-chloropyridin-3-yl)-6-methyl-4-(2,4,6-trifluorophenyl)pyridazine (1002756-87-7).

(5) Compounds capable to have a multisite action, like for example (5.1) bordeaux mixture (8011-63-0), (5.2) captafol (2425-06-1), (5.3) captan (133-06-2) (WO 02/12172), (5.4) chlorothalonil (1897-45-6), (5.5) copper hydroxide (20427-59-2), (5.6) copper naphthenate (1338-02-9), (5.7) copper oxide (1317-39-1), (5.8) copper oxychloride (1332-40-7), (5.9) copper(2+) sulfate (7758-98-7), (5.10) dichlofluanid (1085-98-9), (5.11) dithianon (3347-22-6), (5.12) dodine (2439-10-3), (5.13) dodine free base, (5.14) ferbam (14484-64-1), (5.15) fluorofolpet (719-96-0), (5.16) folpet (133-07-3), (5.17) guazatine (108173-90-6), (5.18) guazatine acetate, (5.19) iminoctadine (13516-27-3), (5.20) iminoctadine albesilate (169202-06-6), (5.21) iminoctadine triacetate (57520-17-9), (5.22) mancopper (53988-93-5), (5.23) mancozeb (8018-01-7), (5.24) maneb (12427-38-2), (5.25) metiram (9006-42-2), (5.26) metiram zinc (9006-42-2), (5.27) oxine-copper (10380-28-6), (5.28) propamidine (104-32-5), (5.29) propineb (12071-83-9), (5.30) sulphur and sulphur preparations including calcium polysulphide (7704-34-9), (5.31) thiram (137-26-8), (5.32) tolylfluanid (731-27-1), (5.33) zineb (12122-67-7) and (5.34) ziram (137-30-4).

(6) Compounds capable to induce a host defence, like for example (6.1) acibenzolar-S-methyl (135158-54-2), (6.2) isotianil (224049-04-1), (6.3) probenazole (27605-76-1) and (6.4) tiadinil (223580-51-6).

(7) Inhibitors of the amino acid and/or protein biosynthesis, for example (7.1) andoprim (23951-85-1), (7.2) blasticidin-S (2079-00-7), (7.3) cyprodinil (121552-61-2), (7.4) kasugamycin (6980-18-3), (7.5) kasugamycin hydrochloride hydrate (19408-46-9), (7.6) mepanipyrim (110235-47-7), (7.7) pyrimethanil (53112-28-0) and (7.8) 3-(5-fluoro-3,3,4,4-tetramethyl-3,4-dihydroisoquinolin-1-yl)quinoline (861647-32-7) (WO2005070917).

(8) Inhibitors of the ATP production, for example (8.1) fentin acetate (900-95-8), (8.2) fentin chloride (639-58-7), (8.3) fentin hydroxide (76-87-9) and (8.4) silthiofam (175217-20-6).

(9) Inhibitors of the cell wall synthesis, for example (9.1) benthiavalicarb (177406-68-7), (9.2) dimethomorph (110488-70-5), (9.3) flumorph (211867-47-9), (9.4) iprovalicarb (140923-17-7), (9.5) mandipropa-

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mid (374726-62-2), (9.6) polyoxins (11113-80-7), (9.7) polyoxorim (22976-86-9), (9.8) validamycin A (37248-47-8) and (9.9) valifenalate (283159-94-4; 283159-90-0).

(10) Inhibitors of the lipid and membrane synthesis, for example (10.1) biphenyl (92-52-4), (10.2) chloroneb (2675-77-6), (10.3) dicloran (99-30-9), (10.4) edifenphos (17109-49-8), (10.5) etridiazole (2593-15-9), (10.6) iodocarb (55406-53-6), (10.7) iprobenfos (26087-47-8), (10.8) isoprothiolane (50512-35-1), (10.9) propamocarb (25606-41-1), (10.10) propamocarb hydrochloride (25606-41-1), (10.11) prothiocarb (19622-08-3), (10.12) pyrazophos (13457-18-6), (10.13) quintozene (82-68-8), (10.14) tecnazene (117-18-0) and (10.15) tolclofos-methyl (57018-04-9).

(11) Inhibitors of the melanine biosynthesis, for example (11.1) carpropamid (104030-54-8), (11.2) diclocymet (139920-32-4), (11.3) fenoxanil (115852-48-7), (11.4) phthalide (27355-22-2), (11.5) pyroquilon (57369-32-1), (11.6) tricyclazole (41814-78-2) and (11.7) 2,2,2-trifluoroethyl {3-methyl-1-[(4-methylbenzoyl)amino]butan-2-yl}carbamate (851524-22-6) (WO2005042474).

(12) Inhibitors of the nucleic acid synthesis, for example (12.1) benalaxyl (71626-11-4), (12.2) benalaxyl-M (kiralaxyl) (98243-83-5), (12.3) bupirimate (41483-43-6), (12.4) clozylacon (67932-85-8), (12.5) dimethirimol (5221-53-4), (12.6) ethirimol (23947-60-6), (12.7) furalaxyl (57646-30-7), (12.8) hymexazol (10004-44-1), (12.9) metalaxyl (57837-19-1), (12.10) metalaxyl-M (mefenoxam) (70630-17-0), (12.11) ofurace (58810-48-3), (12.12) oxadixyl (77732-09-3) and (12.13) oxolinic acid (14698-29-4).

(13) Inhibitors of the signal transduction, for example (13.1) chlozolinate (84332-86-5), (13.2) fenpiclonil (74738-17-3), (13.3) fludioxonil (131341-86-1), (13.4) iprodione (36734-19-7), (13.5) procymidone (32809-16-8), (13.6) quinoxyfen (124495-18-7) and (13.7) vinclozolin (50471-44-8).

(14) Compounds capable to act as an uncoupler, like for example (14.1) binapacryl (485-31-4), (14.2) dinocap (131-72-6), (14.3) ferimzone (89269-64-7), (14.4) fluazinam (79622-59-6) and (14.5) meptyldinocap (131-72-6).

(15) Further compounds, like for example (15.1) benthiazole (21564-17-0), (15.2) bethoxazin (163269-30-5), (15.3) capsimycin (70694-08-5), (15.4) carvone (99-49-0), (15.5) chinomethionat (2439-01-2), (15.6) pyriofenone (chlazafenone) (688046-61-9), (15.7) cufraneb (11096-18-7), (15.8) cyflufenamid (180409-60-3), (15.9) cymoxanil (57966-95-7), (15.10) cyprosulfamide (221667-31-8), (15.11) dazomet (533-74-4), (15.12) debacarb (62732-91-6), (15.13) dichlorophen (97-23-4), (15.14) diclomezine (62865-36-5), (15.15) difenzoquat (49866-87-7), (15.16) difenzoquat methylsulphate (43222-48-6), (15.17) diphenylamine (122-

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39-4), (15.18) ecomate, (15.19) fenpyrazamine (473798-59-3), (15.20) flumetover (154025-04-4), (15.21) fluoroimide (41205-21-4), (15.22) flusulfamide (106917-52-6), (15.23) flutianil (304900-25-2), (15.24) fosetyl-aluminium (39148-24-8), (15.25) fosetyl-calcium, (15.26) fosetyl-sodium (39148-16-8), (15.27) hexachlorobenzene (118-74-1), (15.28) irumamycin (81604-73-1), (15.29) methasulfocarb (66952-49-6), (15.30) methyl isothiocyanate (556-61-6), (15.31) metrafenone (220899-03-6), (15.32) mildiomycin (67527-71-3), (15.33) natamycin (7681-93-8), (15.34) nickel dimethyldithiocarbamate (15521-65-0), (15.35) nitrothal-isopropyl (10552-74-6), (15.36) octhilinone (26530-20-1), (15.37) oxamocarb (917242-12-7), (15.38) oxyfenthiin (34407-87-9), (15.39) pentachlorophenol and salts (87-86-5), (15.40) phenothrin, (15.41) phosphorous acid and its salts (13598-36-2), (15.42) propamocarb-fosetylate, (15.43) propanosine-sodium (88498-02-6), (15.44) proquinazid (189278-12-4), (15.45) pyrimorph (868390-90-3), (15.45e) (2E)-3-(4-tert-butylphenyl)-3-(2-chloropyridin-4-yl)-1-(morpholin-4-yl)prop-2-en-1-one (1231776-28-5), (15.45z) (2Z)-3-(4-tert-butylphenyl)-3-(2-chloropyridin-4-yl)-1-(morpholin-4-yl)prop-2-en-1-one (1231776-29-6), (15.46) pyrrolnitrine (1018-71-9) (EP-A 1 559 320), (15.47) tebufloquin (376645-78-2), (15.48) tecloftalam (76280-91-6), (15.49) tolnifanide (304911-98-6), (15.50) triazoxide (72459-58-6), (15.51) trichlamide (70193-21-4), (15.52) zarilamid (84527-51-5), (15.53) (3S,6S,7R,8R)-8-benzyl-3-[({3-[(isobutyryloxy)methoxy]-4-methoxypyridin-2-yl}carbonyl)amino]-6-methyl-4,9-dioxo-1,5-dioxonan-7-yl 2-methylpropanoate (517875-34-2) (WO2003035617), (15.54) 1-(4-{4-[(5R)-5-(2,6-difluorophenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)-2-[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]ethanone (1003319-79-6) (WO 2008013622), (15.55) 1-(4-{4-[(5S)-5-(2,6-difluorophenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)-2-[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]ethanone (1003319-80-9) (WO 2008013622), (15.56) 1-(4-{4-[5-(2,6-difluorophenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)-2-[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]ethanone (1003318-67-9) (WO 2008013622), (15.57) 1-(4-methoxyphenoxy)-3,3-dimethylbutan-2-yl 1H-imidazole-1-carboxylate (111227-17-9), (15.58) 2,3,5,6-tetrachloro-4-(methylsulfonyl)pyridine (13108-52-6), (15.59) 2,3-dibutyl-6-chlorothieno[2,3-d]pyrimidin-4(3H)-one (221451-58-7), (15.60) 2,6-dimethyl-1H,5H-[1,4]dithiino[2,3-c:5,6-c']dipyrrole-1,3,5,7(2H,6H)-tetrone, (15.61) 2-[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]-1-(4-{4-[(5R)-5-phenyl-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)ethanone (1003316-53-7) (WO 2008013622), (15.62) 2-[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]-1-(4-{4-[(5S)-5-phenyl-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)ethanone (1003316-54-8) (WO 2008013622), (15.63) 2-[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]-1-{4-[4-(5-phenyl-4,5-dihydro-1,2-oxazol-3-yl)-1,3-thiazol-2-yl]piperidin-1-yl}ethanone (1003316-51-5) (WO 2008013622), (15.64) 2-butoxy-6-iodo-3-propyl-4H-chromen-4-one, (15.65) 2-chloro-5-[2-chloro-1-(2,6-difluoro-4-methoxyphenyl)-4-methyl-1H-imidazol-5-yl]pyridine, (15.66) 2-phenylphenol and salts (90-43-7), (15.67) 3-(4,4,5-trifluoro-3,3-dimethyl-3,4-

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dihydroisoquinolin-1-yl)quinoline (861647-85-0) (WO2005070917), (15.68) 3,4,5-trichloropyridine-2,6-dicarbonitrile (17824-85-0), (15.69) 3-[5-(4-chlorophenyl)-2,3-dimethyl-1,2-oxazolidin-3-yl]pyridine, (15.70) 3-chloro-5-(4-chlorophenyl)-4-(2,6-difluorophenyl)-6-methylpyridazine, (15.71) 4-(4-chlorophenyl)-5-(2,6-difluorophenyl)-3,6-dimethylpyridazine, (15.72) 5-amino-1,3,4-thiadiazole-2-thiol, (15.73) 5-chloro-N'-phenyl-N'-(prop-2-yn-1-yl)thiophene-2-sulfonohydrazide (134-31-6), (15.74) 5-fluoro-2-[(4-fluorobenzyl)oxy]pyrimidin-4-amine (1174376-11-4) (WO2009094442), (15.75) 5-fluoro-2-[(4-methylbenzyl)oxy]pyrimidin-4-amine (1174376-25-0) (WO2009094442), (15.76) 5-methyl-6-octyl[1,2,4]triazolo[1,5-a]pyrimidin-7-amine, (15.77) ethyl (2Z)-3-amino-2-cyano-3-phenylprop-2-enoate, (15.78) N'-(4-{[3-(4-chlorobenzyl)-1,2,4-thiadiazol-5-yl]oxy}-2,5-dimethylphenyl)-N-ethyl-N-methylimidoformamide, (15.79) N-(4-chlorobenzyl)-3-[3-methoxy-4-(prop-2-yn-1-yloxy)phenyl]propanamide, (15.80) N-[(4-chlorophenyl)(cyano)methyl]-3-[3-methoxy-4-(prop-2-yn-1-yloxy)phenyl]propanamide, (15.81) N-[(5-bromo-3-chloropyridin-2-yl)methyl]-2,4-dichloropyridine-3-carboxamide, (15.82) N-[1-(5-bromo-3-chloropyridin-2-yl)ethyl]-2,4-dichloropyridine-3-carboxamide, (15.83) N-[1-(5-bromo-3-chloropyridin-2-yl)ethyl]-2-fluoro-4-iodopyridine-3-carboxamide, (15.84) N-{(E)-[(cyclopropylmethoxy)imino][6-(difluoromethoxy)-2,3-difluorophenyl]methyl}-2-phenylacetamide (221201-92-9), (15.85) N-{(Z)-[(cyclopropylmethoxy)imino][6-(difluoromethoxy)-2,3-difluorophenyl]methyl}-2-phenylacetamide (221201-92-9), (15.86) N'-{4-[(3-tert-butyl-4-cyano-1,2-thiazol-5-yl)oxy]-2-chloro-5-methylphenyl}-N-ethyl-N-methylimidoformamide, (15.87) N-methyl-2-(1-{[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]acetyl}piperidin-4-yl)-N-(1,2,3,4-tetrahydronaphthalen-1-yl)-1,3-thiazole-4-carboxamide (922514-49-6) (WO 2007014290), (15.88) N-methyl-2-(1-{[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]acetyl}piperidin-4-yl)-N-[(1R)-1,2,3,4-tetrahydronaphthalen-1-yl]-1,3-thiazole-4-carboxamide (922514-07-6) (WO 2007014290), (15.89) N-methyl-2-(1-{[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]acetyl}piperidin-4-yl)-N-[(1S)-1,2,3,4-tetrahydronaphthalen-1-yl]-1,3-thiazole-4-carboxamide (922514-48-5) (WO 2007014290), (15.90) pentyl {6-[({[(1-methyl-1H-tetrazol-5-yl)(phenyl)methylidene]amino}oxy)methyl]pyridin-2-yl}carbamate, (15.91) phenazine-1-carboxylic acid, (15.92) quinolin-8-ol (134-31-6), (15.93) quinolin-8-ol sulfate (2:1) (134-31-6) and (15.94) tert-butyl {6-[({[(1-methyl-1H-tetrazol-5-yl)(phenyl)methylene]amino}oxy)methyl]pyridin-2-yl}carbamate.

(16) Further compounds, for example (16.1) 1-methyl-3-(trifluoromethyl)-N-[2'-(trifluoromethyl)biphenyl-2-yl]-1H-pyrazole-4-carboxamide, (16.2) N-(4'-chlorobiphenyl-2-yl)-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide, (16.3) N-(2',4'-dichlorobiphenyl-2-yl)-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide, (16.4) 3-(difluoromethyl)-1-methyl-N-[4'-(trifluoromethyl)biphenyl-2-yl]-1H-pyrazole-4-carboxamide, (16.5) N-(2',5'-difluorobiphenyl-2-yl)-1-methyl-3-(trifluoromethyl)-1H-pyrazole-4-carboxamide, (16.6) 3-(difluoromethyl)-1-methyl-N-[4'-(prop-1-yn-1-yl)biphenyl-2-yl]-1H-pyrazole-4-

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carboxamide (known from WO 2004/058723), (16.7) 5-fluoro-1,3-dimethyl-N-[4'-(prop-1-yn-1-yl)biphenyl-2-yl]-1H-pyrazole-4-carboxamide (known from WO 2004/058723), (16.8) 2-chloro-N-[4'-(prop-1-yn-1-yl)biphenyl-2-yl]pyridine-3-carboxamide (known from WO 2004/058723), (16.9) 3-(difluoromethyl)-N-[4'-(3,3-dimethylbut-1-yn-1-yl)biphenyl-2-yl]-1-methyl-1H-pyrazole-4-carboxamide (known from WO 2004/058723), (16.10) N-[4'-(3,3-dimethylbut-1-yn-1-yl)biphenyl-2-yl]-5-fluoro-1,3-dimethyl-1H-pyrazole-4-carboxamide (known from WO 2004/058723), (16.11) 3-(difluoromethyl)-N-(4'-ethynylbiphenyl-2-yl)-1-methyl-1H-pyrazole-4-carboxamide (known from WO 2004/058723), (16.12) N-(4'-ethynylbiphenyl-2-yl)-5-fluoro-1,3-dimethyl-1H-pyrazole-4-carboxamide (known from WO 2004/058723), (16.13) 2-chloro-N-(4'-ethynylbiphenyl-2-yl)pyridine-3-carboxamide (known from WO 2004/058723), (16.14) 2-chloro-N-[4'-(3,3-dimethylbut-1-yn-1-yl)biphenyl-2-yl]pyridine-3-carboxamide (known from WO 2004/058723), (16.15) 4-(difluoromethyl)-2-methyl-N-[4'-(trifluoromethyl)biphenyl-2-yl]-1,3-thiazole-5-carboxamide (known from WO 2004/058723), (16.16) 5-fluoro-N-[4'-(3-hydroxy-3-methylbut-1-yn-1-yl)biphenyl-2-yl]-1,3-dimethyl-1H-pyrazole-4-carboxamide (known from WO 2004/058723), (16.17) 2-chloro-N-[4'-(3-hydroxy-3-methylbut-1-yn-1-yl)biphenyl-2-yl]pyridine-3-carboxamide (known from WO 2004/058723), (16.18) 3-(difluoromethyl)-N-[4'-(3-methoxy-3-methylbut-1-yn-1-yl)biphenyl-2-yl]-1-methyl-1H-pyrazole-4-carboxamide (known from WO 2004/058723), (16.19) 5-fluoro-N-[4'-(3-methoxy-3-methylbut-1-yn-1-yl)biphenyl-2-yl]-1,3-dimethyl-1H-pyrazole-4-carboxamide (known from WO 2004/058723), (16.20) 2-chloro-N-[4'-(3-methoxy-3-methylbut-1-yn-1-yl)biphenyl-2-yl]pyridine-3-carboxamide (known from WO 2004/058723), (16.21) (5-bromo-2-methoxy-4-methylpyridin-3-yl)(2,3,4-trimethoxy-6-methylphenyl)methanone (known from EP-A 1 559 320), (16.22) N-[2-(4-{[3-(4-chlorophenyl)prop-2-yn-1-yl]oxy}-3-methoxyphenyl)ethyl]-N2-(methylsulfonyl)valinamide (220706-93-4), (16.23) 4-oxo-4-[(2-phenylethyl)amino]butanoic acid and (16.24) but-3-yn-1-yl {6-[({[(Z)-(1-methyl-1H-tetrazol-5-yl)(phenyl)methylene]amino}oxy)methyl]pyridin-2-yl}carbamate.

All named mixing partners of the classes (1) to (16) can, if their functional groups enable this, optionally form salts with suitable bases or acids.

Particular preference is further given to combinations comprising at least one further active compound (B) selected from the following groups:

(2.1) bixafen, (2.2) boscalid, (2.6) fluopyram, (2.8) fluxapyroxad, (2.11) isopyrazam (mixture of syn-epimeric racemate 1RS,4SR,9RS and anti-epimeric racemate 1RS,4SR,9SR), (2.12) isopyrazam (anti-epimeric racemate 1RS,4SR,9SR), (2.13) isopyrazam (anti-epimeric enantiomer 1R,4S,9S), (2.14) isopyrazam (anti-epimeric enantiomer 1S,4R,9R), (2.15) isopyrazam (syn epimeric racemate

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1RS,4SR,9RS), (2.16) isopyrazam (syn-epimeric enantiomer 1R,4S,9R), (2.17) isopyrazam (syn-epimeric enantiomer 1S,4R,9S), (2.27) N-[1-(2,4-dichlorophenyl)-1-methoxypropan-2-yl]-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide, (2.29) N-[9-(dichloromethylene)-1,2,3,4-tetrahydro-1,4-methanonaphthalen-5-yl]-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide, (3.1) ametoctradin, (3.2) amisulbrom, (3.3) azoxystrobin, (3.4) cyazofamid, (3.9) famoxadone, (3.10) fenamidone, (3.12) fluoxastrobin, (3.16) picoxystrobin, (3.17) pyraclostrobin, (3.22) trifloxystrobin, (4.6) fluopicolide, (5.1) bordeaux mixture, (5.4) chlorothalonil, (5.5) copper hydroxide, (5.7) copper oxide, (5.8) copper oxychloride, (5.9) copper(2+) sulfate, (5.16) folpet, (5.23) mancozeb, (5.25) metiram, (5.26) metiram zinc, (5.29) propineb, (5.30) sulphur and sulphur preparations including calcium polysulphide, (7.7) pyrimethanil, (9.2) dimethomorph, (9.4) iprovalicarb, (9.5) mandipropamid, (10.9) propamocarb, (10.10) propamocarb hydrochloride, (12.9) metalaxyl, (12.10) metalaxyl-M (mefenoxam), (14.4) fluazinam, (15.9) cymoxanil, (15.24) fosetyl-aluminium, (15.25) fosetyl-calcium, (15.26) fosetyl-sodium, (15.41) phosphorous acid and its salts, (15.42) propamocarb-fosetylate, (15.54) 1-(4-{4-[(5R)-5-(2,6-difluorophenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)-2-[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]ethanone, (15.55) 1-(4-{4-[(5S)-5-(2,6-difluorophenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)-2-[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]ethanone, (15.56) 1-(4-{4-[5-(2,6-difluorophenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)-2-[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]ethanone, (15.60) 2,6-dimethyl-1H,5H-[1,4]dithiino[2,3-c:5,6-c']dipyrrole-1,3,5,7(2H,6H)-tetrone, (15.90) pentyl {6-[({[(1-methyl-1H-tetrazol-5-yl)(phenyl)methylidene]amino}oxy)methyl]pyridin-2-yl}carbamate.

All named mixing partners of the classes (1) to (15) can, if their functional groups enable this, optionally form salts with suitable bases or acids.

In a preferred embodiment this invention is directed to mixtures comprising the compound (I-1) as compound of formula (I) and one component (B), in particular the mixtures (I-1) + (1.1), (I-1) + (1.2), (I-1) + (1.3), (I-1) + (1.4), (I-1) + (1.5), (I-1) + (1.6), (I-1) + (1.7), (I-1) + (1.8), (I-1) + (1.9), (I-1) + (1.10), (I-1) + (1.11), (I-1) + (1.12), (I-1) + (1.13), (I-1) + (1.14), (I-1) + (1.15), (I-1) + (1.16), (I-1) + (1.17), (I-1) + (1.18), (I-1) + (1.19), (I-1) + (1.20), (I-1) + (1.21), (I-1) + (1.22), (I-1) + (1.23), (I-1) + (1.24), (I-1) + (1.25), (I-1) + (1.26), (I-1) + (1.27), (I-1) + (1.28), (I-1) + (1.29), (I-1) + (1.30), (I-1) + (1.31), (I-1) + (1.32), (I-1) + (1.33), (I-1) + (1.34), (I-1) + (1.35), (I-1) + (1.36), (I-1) + (1.37), (I-1) + (1.38), (I-1) + (1.39), (I-1) + (1.40), (I-1) + (1.41), (I-1) + (1.42), (I-1) + (1.43), (I-1) + (1.44), (I-1) + (1.45), (I-1) + (1.46), (I-1) + (1.47), (I-1) + (1.48), (I-1) + (1.49), (I-1) + (1.50), (I-1) + (1.51), (I-1) + (1.52), (I-1) + (1.53), (I-1) + (1.54), (I-1) + (1.55), (I-1) + (1.56), (I-1) + (1.57), (I-1) + (1.58), (I-1) + (1.59), (I-1) + (1.60), (I-1) + (1.61), (I-1) + (1.62), (I-1) + (1.63), (I-1) + (1.64), (I-1) + (2.1), (I-1) + (2.2), (I-1) + (2.3), (I-1) + (2.4),

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(I-1) + (2.5), (I-1) + (2.6), (I-1) + (2.7), (I-1) + (2.8), (I-1) + (2.9), (I-1) + (2.10), (I-1) + (2.11), (I-1) + (2.12), (I-1) + (2.13), (I-1) + (2.14), (I-1) + (2.15), (I-1) + (2.16), (I-1) + (2.17), (I-1) + (2.18), (I-1) + (2.19), (I-1) + (2.20), (I-1) + (2.21), (I-1) + (2.22), (I-1) + (2.23), (I-1) + (2.24), (I-1) + (2.25), (I-1) + (2.26), (I-1) + (2.27), (I-1) + (2.28), (I-1) + (2.29), (I-1) + (3.1), (I-1) + (3.2), (I-1) + (3.3), (I-1) + (3.4), (I-1) + (3.5), (I-1) + (3.6), (I-1) + (3.7), (I-1) + (3.8), (I-1) + (3.9), (I-1) + (3.10), (I-1) + (3.11), (I-1) + (3.12), (I-1) + (3.13), (I-1) + (3.14), (I-1) + (3.15), (I-1) + (3.16), (I-1) + (3.17), (I-1) + (3.18), (I-1) + (3.19), (I-1) + (3.20), (I-1) + (3.21), (I-1) + (3.22), (I-1) + (3.23), (I-1) + (3.24), (I-1) + (3.25), (I-1) + (3.26), (I-1) + (3.27), (I-1) + (3.28), (I-1) + (3.29), (I-1) + (3.30), (I-1) + (3.31), (I-1) + (3.32), (I-1) + (3.33), (I-1) + (4.1), (I-1) + (4.2), (I-1) + (4.3), (I-1) + (4.4), (I-1) + (4.5), (I-1) + (4.6), (I-1) + (4.7), (I-1) + (4.8), (I-1) + (4.9), (I-1) + (4.10), (I-1) + (4.11), (I-1) + (4.12), (I-1) + (4.13), (I-1) + (4.14), (I-1) + (5.1), (I-1) + (5.2), (I-1) + (5.3), (I-1) + (5.4), (I-1) + (5.5), (I-1) + (5.6), (I-1) + (5.7), (I-1) + (5.8), (I-1) + (5.9), (I-1) + (5.10), (I-1) + (5.11), (I-1) + (5.12), (I-1) + (5.13), (I-1) + (5.14), (I-1) + (5.15), (I-1) + (5.16), (I-1) + (5.17), (I-1) + (5.18), (I-1) + (5.19), (I-1) + (5.20), (I-1) + (5.21), (I-1) + (5.22), (I-1) + (5.23), (I-1) + (5.24), (I-1) + (5.25), (I-1) + (5.26), (I-1) + (5.27), (I-1) + (5.28), (I-1) + (5.29), (I-1) + (5.30), (I-1) + (5.31), (I-1) + (5.32), (I-1) + (5.33), (I-1) + (5.34), (I-1) + (6.1), (I-1) + (6.2), (I-1) + (6.3), (I-1) + (6.4), (I-1) + (7.1), (I-1) + (7.2), (I-1) + (7.3), (I-1) + (7.4), (I-1) + (7.5), (I-1) + (7.6), (I-1) + (7.7), (I-1) + (7.8), (I-1) + (8.1), (I-1) + (8.2), (I-1) + (8.3), (I-1) + (8.4), (I-1) + (9.1), (I-1) + (9.2), (I-1) + (9.3), (I-1) + (9.4), (I-1) + (9.5), (I-1) + (9.6), (I-1) + (9.7), (I-1) + (9.8), (I-1) + (9.9), (I-1) + (10.1), (I-1) + (10.2), (I-1) + (10.3), (I-1) + (10.4), (I-1) + (10.5), (I-1) + (10.6), (I-1) + (10.7), (I-1) + (10.8), (I-1) + (10.9), (I-1) + (10.10), (I-1) + (10.11), (I-1) + (10.12), (I-1) + (10.13), (I-1) + (10.14), (I-1) + (10.15), (I-1) + (11.1), (I-1) + (11.2), (I-1) + (11.3), (I-1) + (11.4), (I-1) + (11.5), (I-1) + (11.6), (I-1) + (11.7), (I-1) + (12.1), (I-1) + (12.2), (I-1) + (12.3), (I-1) + (12.4), (I-1) + (12.5), (I-1) + (12.6), (I-1) + (12.7), (I-1) + (12.8), (I-1) + (12.9), (I-1) + (12.10), (I-1) + (12.11), (I-1) + (12.12), (I-1) + (12.13), (I-1) + (13.1), (I-1) + (13.2), (I-1) + (13.3), (I-1) + (13.4), (I-1) + (13.5), (I-1) + (13.6), (I-1) + (13.7), (I-1) + (14.1), (I-1) + (14.2), (I-1) + (14.3), (I-1) + (14.4), (I-1) + (14.5), (I-1) + (15.1), (I-1) + (15.2), (I-1) + (15.3), (I-1) + (15.4), (I-1) + (15.5), (I-1) + (15.6), (I-1) + (15.7), (I-1) + (15.8), (I-1) + (15.9), (I-1) + (15.10), (I-1) + (15.11), (I-1) + (15.12), (I-1) + (15.13), (I-1) + (15.14), (I-1) + (15.15), (I-1) + (15.16), (I-1) + (15.17), (I-1) + (15.18), (I-1) + (15.19), (I-1) + (15.20), (I-1) + (15.21), (I-1) + (15.22), (I-1) + (15.23), (I-1) + (15.24), (I-1) + (15.25), (I-1) + (15.26), (I-1) + (15.27), (I-1) + (15.28), (I-1) + (15.29), (I-1) + (15.30), (I-1) + (15.31), (I-1) + (15.32), (I-1) + (15.33), (I-1) + (15.34), (I-1) + (15.35), (I-1) + (15.36), (I-1) + (15.37), (I-1) + (15.38), (I-1) + (15.39), (I-1) + (15.41), (I-1) + (15.42), (I-1) + (15.43), (I-1) + (15.44), (I-1) + (15.45), (I-1) + (15.46), (I-1) + (15.47), (I-1) + (15.48), (I-1) + (15.49), (I-1) + (15.50), (I-1) + (15.51), (I-1) + (15.52), (I-1) + (15.53), (I-1) + (15.54), (I-1) + (15.55), (I-1) + (15.56), (I-1) + (15.57), (I-1) + (15.58), (I-1) + (15.59), (I-1) + (15.60), (I-1) + (15.61), (I-1) + (15.62), (I-1) + (15.63), (I-1) + (15.64), (I-1) + (15.65),

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(I-1) + (15.66), (I-1) + (15.67), (I-1) + (15.68), (I-1) + (15.69), (I-1) + (15.70), (I-1) + (15.71), (I-1) + (15.72), (I-1) + (15.73), (I-1) + (15.74), (I-1) + (15.75), (I-1) + (15.76), (I-1) + (15.77), (I-1) + (15.78), (I-1) + (15.79), (I-1) + (15.80), (I-1) + (15.81), (I-1) + (15.82), (I-1) + (15.83), (I-1) + (15.84), (I-1) + (15.85), (I-1) + (15.86), (I-1) + (15.87), (I-1) + (15.88), (I-1) + (15.89), (I-1) + (15.90), (I-1) + (15.91), (I-1) + (15.92), (I-1) + (15.93), (I-1) + (15.94).

In a further particularly preferred embodiment this invention is directed to mixtures comprising the compound (I-1) as compound of formula (I) and one component (B), in particular the mixtures (I-1) + (2.1), (I-1) + (2.2), (I-1) + (2.6), (I-1) + (2.8), (I-1) + (2.11), (I-1) + (2.12), (I-1) + (2.13), (I-1) + (2.14), (I-1) + (2.15), (I-1) + (2.16), (I-1) + (2.17), (I-1) + (2.29), (I-1) + (3.1), (I-1) + (3.2), (I-1) + (3.3), (I-1) + (3.4), (I-1) + (3.9), (I-1) + (3.10), (I-1) + (3.12), (I-1) + (3.16), (I-1) + (3.17), (I-1) + (3.22), (I-1) + (4.6), (I-1) + (5.1), (I-1) + (5.4), (I-1) + (5.5), (I-1) + (5.7), (I-1) + (5.8), (I-1) + (5.9), (I-1) + (5.16), (I-1) + (5.23), (I-1) + (5.25), (I-1) + (5.26), (I-1) + (5.29), (I-1) + (5.30), (I-1) + (7.7), (I-1) + (9.2), (I-1) + (9.4), (I-1) + (9.5), (I-1) + (10.9), (I-1) + (10.10), (I-1) + (12.9), (I-1) + (12.10), (I-1) + (14.4), (I-1) + (15.9), (I-1) + (15.24), (I-1) + (15.25), (I-1) + (15.26), (I-1) + (15.41), (I-1) + (15.42), (I-1) + (15.54), (I-1) + (15.55), (I-1) + (15.56), (I-1) + (15.60), (I-1) + (15.90).

In a preferred embodiment this invention is directed to mixtures comprising the compound (I-2) as compound of formula (I) and one component (B), in particular the mixtures (I-2) + (1.1), (I-2) + (1.2), (I-2) + (1.3), (I-2) + (1.4), (I-2) + (1.5), (I-2) + (1.6), (I-2) + (1.7), (I-2) + (1.8), (I-2) + (1.9), (I-2) + (1.10), (I-2) + (1.11), (I-2) + (1.12), (I-2) + (1.13), (I-2) + (1.14), (I-2) + (1.15), (I-2) + (1.16), (I-2) + (1.17), (I-2) + (1.18), (I-2) + (1.19), (I-2) + (1.20), (I-2) + (1.21), (I-2) + (1.22), (I-2) + (1.23), (I-2) + (1.24), (I-2) + (1.25), (I-2) + (1.26), (I-2) + (1.27), (I-2) + (1.28), (I-2) + (1.29), (I-2) + (1.30), (I-2) + (1.31), (I-2) + (1.32), (I-2) + (1.33), (I-2) + (1.34), (I-2) + (1.35), (I-2) + (1.36), (I-2) + (1.37), (I-2) + (1.38), (I-2) + (1.39), (I-2) + (1.40), (I-2) + (1.41), (I-2) + (1.42), (I-2) + (1.43), (I-2) + (1.44), (I-2) + (1.45), (I-2) + (1.46), (I-2) + (1.47), (I-2) + (1.48), (I-2) + (1.49), (I-2) + (1.50), (I-2) + (1.51), (I-2) + (1.52), (I-2) + (1.53), (I-2) + (1.54), (I-2) + (1.55), (I-2) + (1.56), (I-2) + (1.57), (I-2) + (1.58), (I-2) + (1.59), (I-2) + (1.60), (I-2) + (1.61), (I-2) + (1.62), (I-2) + (1.63), (I-2) + (1.64), (I-2) + (2.1), (I-2) + (2.2), (I-2) + (2.3), (I-2) + (2.4), (I-2) + (2.5), (I-2) + (2.6), (I-2) + (2.7), (I-2) + (2.8), (I-2) + (2.9), (I-2) + (2.10), (I-2) + (2.11), (I-2) + (2.12), (I-2) + (2.13), (I-2) + (2.14), (I-2) + (2.15), (I-2) + (2.16), (I-2) + (2.17), (I-2) + (2.18), (I-2) + (2.19), (I-2) + (2.20), (I-2) + (2.21), (I-2) + (2.22), (I-2) + (2.23), (I-2) + (2.24), (I-2) + (2.25), (I-2) + (2.26), (I-2) + (2.27), (I-2) + (2.28), (I-2) + (2.29), (I-2) + (3.1), (I-2) + (3.2), (I-2) + (3.3), (I-2) + (3.4), (I-2) + (3.5), (I-2) + (3.6), (I-2) + (3.7), (I-2) + (3.8), (I-2) + (3.9), (I-2) + (3.10), (I-2) + (3.11), (I-2) + (3.12), (I-2) + (3.13), (I-2) + (3.14), (I-2) + (3.15), (I-2) + (3.16), (I-2) + (3.17), (I-2) + (3.18), (I-2) + (3.19), (I-2) + (3.20), (I-2) + (3.21), (I-2) + (3.22), (I-2) + (3.23), (I-2) + (3.24), (I-2) + (3.25), (I-2) + (3.26), (I-2) + (3.27), (I-

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2) + (3.28), (I-2) + (3.29), (I-2) + (3.30), (I-2) + (3.31), (I-2) + (3.32), (I-2) + (3.33), (I-2) + (4.1), (I-2) + (4.2), (I-2) + (4.3), (I-2) + (4.4), (I-2) + (4.5), (I-2) + (4.6), (I-2) + (4.7), (I-2) + (4.8), (I-2) + (4.9), (I-2) + (4.10), (I-2) + (4.11), (I-2) + (4.12), (I-2) + (4.13), (I-2) + (4.14), (I-2) + (5.1), (I-2) + (5.2), (I-2) + (5.3), (I-2) + (5.4), (I-2) + (5.5), (I-2) + (5.6), (I-2) + (5.7), (I-2) + (5.8), (I-2) + (5.9), (I-2) + (5.10), (I-2) + (5.11), (I-2) + (5.12), (I-2) + (5.13), (I-2) + (5.14), (I-2) + (5.15), (I-2) + (5.16), (I-2) + (5.17), (I-2) + (5.18), (I-2) + (5.19), (I-2) + (5.20), (I-2) + (5.21), (I-2) + (5.22), (I-2) + (5.23), (I-2) + (5.24), (I-2) + (5.25), (I-2) + (5.26), (I-2) + (5.27), (I-2) + (5.28), (I-2) + (5.29), (I-2) + (5.30), (I-2) + (5.31), (I-2) + (5.32), (I-2) + (5.33), (I-2) + (5.34), (I-2) + (6.1), (I-2) + (6.2), (I-2) + (6.3), (I-2) + (6.4), (I-2) + (7.1), (I-2) + (7.2), (I-2) + (7.3), (I-2) + (7.4), (I-2) + (7.5), (I-2) + (7.6), (I-2) + (7.7), (I-2) + (7.8), (I-2) + (8.1), (I-2) + (8.2), (I-2) + (8.3), (I-2) + (8.4), (I-2) + (9.1), (I-2) + (9.2), (I-2) + (9.3), (I-2) + (9.4), (I-2) + (9.5), (I-2) + (9.6), (I-2) + (9.7), (I-2) + (9.8), (I-2) + (9.9), (I-2) + (10.1), (I-2) + (10.2), (I-2) + (10.3), (I-2) + (10.4), (I-2) + (10.5), (I-2) + (10.6), (I-2) + (10.7), (I-2) + (10.8), (I-2) + (10.9), (I-2) + (10.10), (I-2) + (10.11), (I-2) + (10.12), (I-2) + (10.13), (I-2) + (10.14), (I-2) + (10.15), (I-2) + (11.1), (I-2) + (11.2), (I-2) + (11.3), (I-2) + (11.4), (I-2) + (11.5), (I-2) + (11.6), (I-2) + (11.7), (I-2) + (12.1), (I-2) + (12.2), (I-2) + (12.3), (I-2) + (12.4), (I-2) + (12.5), (I-2) + (12.6), (I-2) + (12.7), (I-2) + (12.8), (I-2) + (12.9), (I-2) + (12.10), (I-2) + (12.11), (I-2) + (12.12), (I-2) + (12.13), (I-2) + (13.1), (I-2) + (13.2), (I-2) + (13.3), (I-2) + (13.4), (I-2) + (13.5), (I-2) + (13.6), (I-2) + (13.7), (I-2) + (14.1), (I-2) + (14.2), (I-2) + (14.3), (I-2) + (14.4), (I-2) + (14.5), (I-2) + (15.1), (I-2) + (15.2), (I-2) + (15.3), (I-2) + (15.4), (I-2) + (15.5), (I-2) + (15.6), (I-2) + (15.7), (I-2) + (15.8), (I-2) + (15.9), (I-2) + (15.10), (I-2) + (15.11), (I-2) + (15.12), (I-2) + (15.13), (I-2) + (15.14), (I-2) + (15.15), (I-2) + (15.16), (I-2) + (15.17), (I-2) + (15.18), (I-2) + (15.19), (I-2) + (15.20), (I-2) + (15.21), (I-2) + (15.22), (I-2) + (15.23), (I-2) + (15.24), (I-2) + (15.25), (I-2) + (15.26), (I-2) + (15.27), (I-2) + (15.28), (I-2) + (15.29), (I-2) + (15.30), (I-2) + (15.31), (I-2) + (15.32), (I-2) + (15.33), (I-2) + (15.34), (I-2) + (15.35), (I-2) + (15.36), (I-2) + (15.37), (I-2) + (15.38), (I-2) + (15.39), (I-2) + (15.41), (I-2) + (15.42), (I-2) + (15.43), (I-2) + (15.44), (I-2) + (15.45), (I-2) + (15.46), (I-2) + (15.47), (I-2) + (15.48), (I-2) + (15.49), (I-2) + (15.50), (I-2) + (15.51), (I-2) + (15.52), (I-2) + (15.53), (I-2) + (15.54), (I-2) + (15.55), (I-2) + (15.56), (I-2) + (15.57), (I-2) + (15.58), (I-2) + (15.59), (I-2) + (15.60), (I-2) + (15.61), (I-2) + (15.62), (I-2) + (15.63), (I-2) + (15.64), (I-2) + (15.65), (I-2) + (15.66), (I-2) + (15.67), (I-2) + (15.68), (I-2) + (15.69), (I-2) + (15.70), (I-2) + (15.71), (I-2) + (15.72), (I-2) + (15.73), (I-2) + (15.74), (I-2) + (15.75), (I-2) + (15.76), (I-2) + (15.77), (I-2) + (15.78), (I-2) + (15.79), (I-2) + (15.80), (I-2) + (15.81), (I-2) + (15.82), (I-2) + (15.83), (I-2) + (15.84), (I-2) + (15.85), (I-2) + (15.86), (I-2) + (15.87), (I-2) + (15.88), (I-2) + (15.89), (I-2) + (15.90), (I-2) + (15.91), (I-2) + (15.92), (I-2) + (15.93), (I-2) + (15.94).

In a further particularly preferred embodiment this invention is directed to mixtures comprising the compound (I-2) as compound of formula (I) and one component (B), in particular the mixtures (I-2) + (2.1), (I-2) + (2.2),

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(I-2) + (2.6), (I-2) + (2.8), (I-2) + (2.11), (I-2) + (2.12), (I-2) + (2.13), (I-2) + (2.14), (I-2) + (2.15), (I-2) + (2.16), (I-2) + (2.17), (I-2) + (2.29), (I-2) + (3.1), (I-2) + (3.2), (I-2) + (3.3), (I-2) + (3.4), (I-2) + (3.9), (I-2) + (3.10), (I-2) + (3.12), (I-2) + (3.16), (I-2) + (3.17), (I-2) + (3.22), (I-2) + (4.6), (I-2) + (5.1), (I-2) + (5.4), (I-2) + (5.5), (I-2) + (5.7), (I-2) + (5.8), (I-2) + (5.9), (I-2) + (5.16), (I-2) + (5.23), (I-2) + (5.25), (I-2) + (5.26), (I-2) + (5.29), (I-2) + (5.30), (I-2) + (7.7), (I-2) + (9.2), (I-2) + (9.4), (I-2) + (9.5), (I-2) + (10.9), (I-2) + (10.10), (I-2) + (12.9), (I-2) + (12.10), (I-2) + (14.4), (I-2) + (15.9), (I-2) + (15.24), (I-2) + (15.25), (I-2) + (15.26), (I-2) + (15.41), (I-2) + (15.42), (I-2) + (15.54), (I-2) + (15.55), (I-2) + (15.56), (I-2) + (15.60), (I-2) + (15.90).

In a preferred embodiment this invention is directed to mixtures comprising the compound (I-3) as compound of formula (I) and one component (B), in particular the mixtures (I-3) + (1.1), (I-3) + (1.2), (I-3) + (1.3), (I-3) + (1.4), (I-3) + (1.5), (I-3) + (1.6), (I-3) + (1.7), (I-3) + (1.8), (I-3) + (1.9), (I-3) + (1.10), (I-3) + (1.11), (I-3) + (1.12), (I-3) + (1.13), (I-3) + (1.14), (I-3) + (1.15), (I-3) + (1.16), (I-3) + (1.17), (I-3) + (1.18), (I-3) + (1.19), (I-3) + (1.20), (I-3) + (1.21), (I-3) + (1.22), (I-3) + (1.23), (I-3) + (1.24), (I-3) + (1.25), (I-3) + (1.26), (I-3) + (1.27), (I-3) + (1.28), (I-3) + (1.29), (I-3) + (1.30), (I-3) + (1.31), (I-3) + (1.32), (I-3) + (1.33), (I-3) + (1.34), (I-3) + (1.35), (I-3) + (1.36), (I-3) + (1.37), (I-3) + (1.38), (I-3) + (1.39), (I-3) + (1.40), (I-3) + (1.41), (I-3) + (1.42), (I-3) + (1.43), (I-3) + (1.44), (I-3) + (1.45), (I-3) + (1.46), (I-3) + (1.47), (I-3) + (1.48), (I-3) + (1.49), (I-3) + (1.50), (I-3) + (1.51), (I-3) + (1.52), (I-3) + (1.53), (I-3) + (1.54), (I-3) + (1.55), (I-3) + (1.56), (I-3) + (1.57), (I-3) + (1.58), (I-3) + (1.59), (I-3) + (1.60), (I-3) + (1.61), (I-3) + (1.62), (I-3) + (1.63), (I-3) + (1.64), (I-3) + (2.1), (I-3) + (2.2), (I-3) + (2.3), (I-3) + (2.4), (I-3) + (2.5), (I-3) + (2.6), (I-3) + (2.7), (I-3) + (2.8), (I-3) + (2.9), (I-3) + (2.10), (I-3) + (2.11), (I-3) + (2.12), (I-3) + (2.13), (I-3) + (2.14), (I-3) + (2.15), (I-3) + (2.16), (I-3) + (2.17), (I-3) + (2.18), (I-3) + (2.19), (I-3) + (2.20), (I-3) + (2.21), (I-3) + (2.22), (I-3) + (2.23), (I-3) + (2.24), (I-3) + (2.25), (I-3) + (2.26), (I-3) + (2.27), (I-3) + (2.28), (I-3) + (2.29), (I-3) + (3.1), (I-3) + (3.2), (I-3) + (3.3), (I-3) + (3.4), (I-3) + (3.5), (I-3) + (3.6), (I-3) + (3.7), (I-3) + (3.8), (I-3) + (3.9), (I-3) + (3.10), (I-3) + (3.11), (I-3) + (3.12), (I-3) + (3.13), (I-3) + (3.14), (I-3) + (3.15), (I-3) + (3.16), (I-3) + (3.17), (I-3) + (3.18), (I-3) + (3.19), (I-3) + (3.20), (I-3) + (3.21), (I-3) + (3.22), (I-3) + (3.23), (I-3) + (3.24), (I-3) + (3.25), (I-3) + (3.26), (I-3) + (3.27), (I-3) + (3.28), (I-3) + (3.29), (I-3) + (3.30), (I-3) + (3.31), (I-3) + (3.32), (I-3) + (3.33), (I-3) + (4.1), (I-3) + (4.2), (I-3) + (4.3), (I-3) + (4.4), (I-3) + (4.5), (I-3) + (4.6), (I-3) + (4.7), (I-3) + (4.8), (I-3) + (4.9), (I-3) + (4.10), (I-3) + (4.11), (I-3) + (4.12), (I-3) + (4.13), (I-3) + (4.14), (I-3) + (5.1), (I-3) + (5.2), (I-3) + (5.3), (I-3) + (5.4), (I-3) + (5.5), (I-3) + (5.6), (I-3) + (5.7), (I-3) + (5.8), (I-3) + (5.9), (I-3) + (5.10), (I-3) + (5.11), (I-3) + (5.12), (I-3) + (5.13), (I-3) + (5.14), (I-3) + (5.15), (I-3) + (5.16), (I-3) + (5.17), (I-3) + (5.18), (I-3) + (5.19), (I-3) + (5.20), (I-3) + (5.21), (I-3) + (5.22), (I-3) + (5.23), (I-3) + (5.24), (I-3) + (5.25), (I-3) + (5.26), (I-3) + (5.27), (I-3) + (5.28), (I-3) + (5.29), (I-3) + (5.30), (I-3) + (5.31), (I-3) + (5.32), (I-3) + (5.33), (I-3) + (5.34), (I-3) + (6.1), (I-3) + (6.2), (I-3) + (6.3), (I-3) + (6.4), (I-3) + (7.1), (I-3) + (7.2), (I-3) + (7.3), (I-

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3) + (7.4), (I-3) + (7.5), (I-3) + (7.6), (I-3) + (7.7), (I-3) + (7.8), (I-3) + (8.1), (I-3) + (8.2), (I-3) + (8.3), (I-3) + (8.4), (I-3) + (9.1), (I-3) + (9.2), (I-3) + (9.3), (I-3) + (9.4), (I-3) + (9.5), (I-3) + (9.6), (I-3) + (9.7), (I-3) + (9.8), (I-3) + (9.9), (I-3) + (10.1), (I-3) + (10.2), (I-3) + (10.3), (I-3) + (10.4), (I-3) + (10.5), (I-3) + (10.6), (I-3) + (10.7), (I-3) + (10.8), (I-3) + (10.9), (I-3) + (10.10), (I-3) + (10.11), (I-3) + (10.12), (I-3) + (10.13), (I-3) + (10.14), (I-3) + (10.15), (I-3) + (11.1), (I-3) + (11.2), (I-3) + (11.3), (I-3) + (11.4), (I-3) + (11.5), (I-3) + (11.6), (I-3) + (11.7), (I-3) + (12.1), (I-3) + (12.2), (I-3) + (12.3), (I-3) + (12.4), (I-3) + (12.5), (I-3) + (12.6), (I-3) + (12.7), (I-3) + (12.8), (I-3) + (12.9), (I-3) + (12.10), (I-3) + (12.11), (I-3) + (12.12), (I-3) + (12.13), (I-3) + (13.1), (I-3) + (13.2), (I-3) + (13.3), (I-3) + (13.4), (I-3) + (13.5), (I-3) + (13.6), (I-3) + (13.7), (I-3) + (14.1), (I-3) + (14.2), (I-3) + (14.3), (I-3) + (14.4), (I-3) + (14.5), (I-3) + (15.1), (I-3) + (15.2), (I-3) + (15.3), (I-3) + (15.4), (I-3) + (15.5), (I-3) + (15.6), (I-3) + (15.7), (I-3) + (15.8), (I-3) + (15.9), (I-3) + (15.10), (I-3) + (15.11), (I-3) + (15.12), (I-3) + (15.13), (I-3) + (15.14), (I-3) + (15.15), (I-3) + (15.16), (I-3) + (15.17), (I-3) + (15.18), (I-3) + (15.19), (I-3) + (15.20), (I-3) + (15.21), (I-3) + (15.22), (I-3) + (15.23), (I-3) + (15.24), (I-3) + (15.25), (I-3) + (15.26), (I-3) + (15.27), (I-3) + (15.28), (I-3) + (15.29), (I-3) + (15.30), (I-3) + (15.31), (I-3) + (15.32), (I-3) + (15.33), (I-3) + (15.34), (I-3) + (15.35), (I-3) + (15.36), (I-3) + (15.37), (I-3) + (15.38), (I-3) + (15.39), (I-3) + (15.41), (I-3) + (15.42), (I-3) + (15.43), (I-3) + (15.44), (I-3) + (15.45), (I-3) + (15.46), (I-3) + (15.47), (I-3) + (15.48), (I-3) + (15.49), (I-3) + (15.50), (I-3) + (15.51), (I-3) + (15.52), (I-3) + (15.53), (I-3) + (15.54), (I-3) + (15.55), (I-3) + (15.56), (I-3) + (15.57), (I-3) + (15.58), (I-3) + (15.59), (I-3) + (15.60), (I-3) + (15.61), (I-3) + (15.62), (I-3) + (15.63), (I-3) + (15.64), (I-3) + (15.65), (I-3) + (15.66), (I-3) + (15.67), (I-3) + (15.68), (I-3) + (15.69), (I-3) + (15.70), (I-3) + (15.71), (I-3) + (15.72), (I-3) + (15.73), (I-3) + (15.74), (I-3) + (15.75), (I-3) + (15.76), (I-3) + (15.77), (I-3) + (15.78), (I-3) + (15.79), (I-3) + (15.80), (I-3) + (15.81), (I-3) + (15.82), (I-3) + (15.83), (I-3) + (15.84), (I-3) + (15.85), (I-3) + (15.86), (I-3) + (15.87), (I-3) + (15.88), (I-3) + (15.89), (I-3) + (15.90), (I-3) + (15.91), (I-3) + (15.92), (I-3) + (15.93), (I-3) + (15.94).

In a further particularly preferred embodiment this invention is directed to mixtures comprising the compound (I-3) as compound of formula (I) and one component (B), in particular the mixtures (I-3) + (2.1), (I-3) + (2.2), (I-3) + (2.6), (I-3) + (2.8), (I-3) + (2.11), (I-3) + (2.12), (I-3) + (2.13), (I-3) + (2.14), (I-3) + (2.15), (I-3) + (2.16), (I-3) + (2.17), (I-3) + (2.29), (I-3) + (3.1), (I-3) + (3.2), (I-3) + (3.3), (I-3) + (3.4), (I-3) + (3.9), (I-3) + (3.10), (I-3) + (3.12), (I-3) + (3.16), (I-3) + (3.17), (I-3) + (3.22), (I-3) + (4.6), (I-3) + (5.1), (I-3) + (5.4), (I-3) + (5.5), (I-3) + (5.7), (I-3) + (5.8), (I-3) + (5.9), (I-3) + (5.16), (I-3) + (5.23), (I-3) + (5.25), (I-3) + (5.26), (I-3) + (5.29), (I-3) + (5.30), (I-3) + (7.7), (I-3) + (9.2), (I-3) + (9.4), (I-3) + (9.5), (I-3) + (10.9), (I-3) + (10.10), (I-3) + (12.9), (I-3) + (12.10), (I-3) + (14.4), (I-3) + (15.9), (I-3) + (15.24), (I-3) + (15.25), (I-3) + (15.26), (I-3) + (15.41), (I-3) + (15.42), (I-3) + (15.54), (I-3) + (15.55), (I-3) + (15.56), (I-3) + (15.60), (I-3) + (15.90).

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In a preferred embodiment this invention is directed to mixtures comprising the compound (I-4) as compound of formula (I) and one component (B), in particular the mixtures (I-4) + (1.1), (I-4) + (1.2), (I-4) + (1.3), (I-4) + (1.4), (I-4) + (1.5), (I-4) + (1.6), (I-4) + (1.7), (I-4) + (1.8), (I-4) + (1.9), (I-4) + (1.10), (I-4) + (1.11), (I-4) + (1.12), (I-4) + (1.13), (I-4) + (1.14), (I-4) + (1.15), (I-4) + (1.16), (I-4) + (1.17), (I-4) + (1.18), (I-4) + (1.19), (I-4) + (1.20), (I-4) + (1.21), (I-4) + (1.22), (I-4) + (1.23), (I-4) + (1.24), (I-4) + (1.25), (I-4) + (1.26), (I-4) + (1.27), (I-4) + (1.28), (I-4) + (1.29), (I-4) + (1.30), (I-4) + (1.31), (I-4) + (1.32), (I-4) + (1.33), (I-4) + (1.34), (I-4) + (1.35), (I-4) + (1.36), (I-4) + (1.37), (I-4) + (1.38), (I-4) + (1.39), (I-4) + (1.40), (I-4) + (1.41), (I-4) + (1.42), (I-4) + (1.43), (I-4) + (1.44), (I-4) + (1.45), (I-4) + (1.46), (I-4) + (1.47), (I-4) + (1.48), (I-4) + (1.49), (I-4) + (1.50), (I-4) + (1.51), (I-4) + (1.52), (I-4) + (1.53), (I-4) + (1.54), (I-4) + (1.55), (I-4) + (1.56), (I-4) + (1.57), (I-4) + (1.58), (I-4) + (1.59), (I-4) + (1.60), (I-4) + (1.61), (I-4) + (1.62), (I-4) + (1.63), (I-4) + (1.64), (I-4) + (2.1), (I-4) + (2.2), (I-4) + (2.3), (I-4) + (2.4), (I-4) + (2.5), (I-4) + (2.6), (I-4) + (2.7), (I-4) + (2.8), (I-4) + (2.9), (I-4) + (2.10), (I-4) + (2.11), (I-4) + (2.12), (I-4) + (2.13), (I-4) + (2.14), (I-4) + (2.15), (I-4) + (2.16), (I-4) + (2.17), (I-4) + (2.18), (I-4) + (2.19), (I-4) + (2.20), (I-4) + (2.21), (I-4) + (2.22), (I-4) + (2.23), (I-4) + (2.24), (I-4) + (2.25), (I-4) + (2.26), (I-4) + (2.27), (I-4) + (2.28), (I-4) + (2.29), (I-4) + (3.1), (I-4) + (3.2), (I-4) + (3.3), (I-4) + (3.4), (I-4) + (3.5), (I-4) + (3.6), (I-4) + (3.7), (I-4) + (3.8), (I-4) + (3.9), (I-4) + (3.10), (I-4) + (3.11), (I-4) + (3.12), (I-4) + (3.13), (I-4) + (3.14), (I-4) + (3.15), (I-4) + (3.16), (I-4) + (3.17), (I-4) + (3.18), (I-4) + (3.19), (I-4) + (3.20), (I-4) + (3.21), (I-4) + (3.22), (I-4) + (3.23), (I-4) + (3.24), (I-4) + (3.25), (I-4) + (3.26), (I-4) + (3.27), (I-4) + (3.28), (I-4) + (3.29), (I-4) + (3.30), (I-4) + (3.31), (I-4) + (3.32), (I-4) + (3.33), (I-4) + (4.1), (I-4) + (4.2), (I-4) + (4.3), (I-4) + (4.4), (I-4) + (4.5), (I-4) + (4.6), (I-4) + (4.7), (I-4) + (4.8), (I-4) + (4.9), (I-4) + (4.10), (I-4) + (4.11), (I-4) + (4.12), (I-4) + (4.13), (I-4) + (4.14), (I-4) + (5.1), (I-4) + (5.2), (I-4) + (5.3), (I-4) + (5.4), (I-4) + (5.5), (I-4) + (5.6), (I-4) + (5.7), (I-4) + (5.8), (I-4) + (5.9), (I-4) + (5.10), (I-4) + (5.11), (I-4) + (5.12), (I-4) + (5.13), (I-4) + (5.14), (I-4) + (5.15), (I-4) + (5.16), (I-4) + (5.17), (I-4) + (5.18), (I-4) + (5.19), (I-4) + (5.20), (I-4) + (5.21), (I-4) + (5.22), (I-4) + (5.23), (I-4) + (5.24), (I-4) + (5.25), (I-4) + (5.26), (I-4) + (5.27), (I-4) + (5.28), (I-4) + (5.29), (I-4) + (5.30), (I-4) + (5.31), (I-4) + (5.32), (I-4) + (5.33), (I-4) + (5.34), (I-4) + (6.1), (I-4) + (6.2), (I-4) + (6.3), (I-4) + (6.4), (I-4) + (7.1), (I-4) + (7.2), (I-4) + (7.3), (I-4) + (7.4), (I-4) + (7.5), (I-4) + (7.6), (I-4) + (7.7), (I-4) + (7.8), (I-4) + (8.1), (I-4) + (8.2), (I-4) + (8.3), (I-4) + (8.4), (I-4) + (9.1), (I-4) + (9.2), (I-4) + (9.3), (I-4) + (9.4), (I-4) + (9.5), (I-4) + (9.6), (I-4) + (9.7), (I-4) + (9.8), (I-4) + (9.9), (I-4) + (10.1), (I-4) + (10.2), (I-4) + (10.3), (I-4) + (10.4), (I-4) + (10.5), (I-4) + (10.6), (I-4) + (10.7), (I-4) + (10.8), (I-4) + (10.9), (I-4) + (10.10), (I-4) + (10.11), (I-4) + (10.12), (I-4) + (10.13), (I-4) + (10.14), (I-4) + (10.15), (I-4) + (11.1), (I-4) + (11.2), (I-4) + (11.3), (I-4) + (11.4), (I-4) + (11.5), (I-4) + (11.6), (I-4) + (11.7), (I-4) + (12.1), (I-4) + (12.2), (I-4) + (12.3), (I-4) + (12.4), (I-4) + (12.5), (I-4) + (12.6), (I-4) + (12.7), (I-4) + (12.8), (I-4) + (12.9), (I-4) + (12.10), (I-4) + (12.11), (I-4) + (12.12), (I-

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4) + (12.13), (I-4) + (13.1), (I-4) + (13.2), (I-4) + (13.3), (I-4) + (13.4), (I-4) + (13.5), (I-4) + (13.6), (I-4) + (13.7), (I-4) + (14.1), (I-4) + (14.2), (I-4) + (14.3), (I-4) + (14.4), (I-4) + (14.5), (I-4) + (15.1), (I-4) + (15.2), (I-4) + (15.3), (I-4) + (15.4), (I-4) + (15.5), (I-4) + (15.6), (I-4) + (15.7), (I-4) + (15.8), (I-4) + (15.9), (I-4) + (15.10), (I-4) + (15.11), (I-4) + (15.12), (I-4) + (15.13), (I-4) + (15.14), (I-4) + (15.15), (I-4) + (15.16), (I-4) + (15.17), (I-4) + (15.18), (I-4) + (15.19), (I-4) + (15.20), (I-4) + (15.21), (I-4) + (15.22), (I-4) + (15.23), (I-4) + (15.24), (I-4) + (15.25), (I-4) + (15.26), (I-4) + (15.27), (I-4) + (15.28), (I-4) + (15.29), (I-4) + (15.30), (I-4) + (15.31), (I-4) + (15.32), (I-4) + (15.33), (I-4) + (15.34), (I-4) + (15.35), (I-4) + (15.36), (I-4) + (15.37), (I-4) + (15.38), (I-4) + (15.39), (I-4) + (15.41), (I-4) + (15.42), (I-4) + (15.43), (I-4) + (15.44), (I-4) + (15.45), (I-4) + (15.46), (I-4) + (15.47), (I-4) + (15.48), (I-4) + (15.49), (I-4) + (15.50), (I-4) + (15.51), (I-4) + (15.52), (I-4) + (15.53), (I-4) + (15.54), (I-4) + (15.55), (I-4) + (15.56), (I-4) + (15.57), (I-4) + (15.58), (I-4) + (15.59), (I-4) + (15.60), (I-4) + (15.61), (I-4) + (15.62), (I-4) + (15.63), (I-4) + (15.64), (I-4) + (15.65), (I-4) + (15.66), (I-4) + (15.67), (I-4) + (15.68), (I-4) + (15.69), (I-4) + (15.70), (I-4) + (15.71), (I-4) + (15.72), (I-4) + (15.73), (I-4) + (15.74), (I-4) + (15.75), (I-4) + (15.76), (I-4) + (15.77), (I-4) + (15.78), (I-4) + (15.79), (I-4) + (15.80), (I-4) + (15.81), (I-4) + (15.82), (I-4) + (15.83), (I-4) + (15.84), (I-4) + (15.85), (I-4) + (15.86), (I-4) + (15.87), (I-4) + (15.88), (I-4) + (15.89), (I-4) + (15.90), (I-4) + (15.91), (I-4) + (15.92), (I-4) + (15.93), (I-4) + (15.94).

In a further particularly preferred embodiment this invention is directed to mixtures comprising the compound (I-4) as compound of formula (I) and one component (B), in particular the mixtures (I-4) + (2.1), (I-4) + (2.2), (I-4) + (2.6), (I-4) + (2.8), (I-4) + (2.11), (I-4) + (2.12), (I-4) + (2.13), (I-4) + (2.14), (I-4) + (2.15), (I-4) + (2.16), (I-4) + (2.17), (I-4) + (2.29), (I-4) + (3.1), (I-4) + (3.2), (I-4) + (3.3), (I-4) + (3.4), (I-4) + (3.9), (I-4) + (3.10), (I-4) + (3.12), (I-4) + (3.16), (I-4) + (3.17), (I-4) + (3.22), (I-4) + (4.6), (I-4) + (5.1), (I-4) + (5.4), (I-4) + (5.5), (I-4) + (5.7), (I-4) + (5.8), (I-4) + (5.9), (I-4) + (5.16), (I-4) + (5.23), (I-4) + (5.25), (I-4) + (5.26), (I-4) + (5.29), (I-4) + (5.30), (I-4) + (7.7), (I-4) + (9.2), (I-4) + (9.4), (I-4) + (9.5), (I-4) + (10.9), (I-4) + (10.10), (I-4) + (12.9), (I-4) + (12.10), (I-4) + (14.4), (I-4) + (15.9), (I-4) + (15.24), (I-4) + (15.25), (I-4) + (15.26), (I-4) + (15.41), (I-4) + (15.42), (I-4) + (15.54), (I-4) + (15.55), (I-4) + (15.56), (I-4) + (15.60), (I-4) + (15.90).

In a preferred embodiment this invention is directed to mixtures comprising the compound (I-5) as compound of formula (I) and one component (B), in particular the mixtures (I-5) + (1.1), (I-5) + (1.2), (I-5) + (1.3), (I-5) + (1.4), (I-5) + (1.5), (I-5) + (1.6), (I-5) + (1.7), (I-5) + (1.8), (I-5) + (1.9), (I-5) + (1.10), (I-5) + (1.11), (I-5) + (1.12), (I-5) + (1.13), (I-5) + (1.14), (I-5) + (1.15), (I-5) + (1.16), (I-5) + (1.17), (I-5) + (1.18), (I-5) + (1.19), (I-5) + (1.20), (I-5) + (1.21), (I-5) + (1.22), (I-5) + (1.23), (I-5) + (1.24), (I-5) + (1.25), (I-5) + (1.26), (I-5) + (1.27), (I-5) + (1.28), (I-5) + (1.29), (I-5) + (1.30), (I-5) + (1.31), (I-5) + (1.32), (I-5) + (1.33), (I-5) + (1.34), (I-5) + (1.35), (I-5) + (1.36), (I-5) + (1.37), (I-5) + (1.38), (I-5) + (1.39), (I-

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5) + (1.40), (I-5) + (1.41), (I-5) + (1.42), (I-5) + (1.43), (I-5) + (1.44), (I-5) + (1.45), (I-5) + (1.46), (I-5) + (1.47), (I-5) + (1.48), (I-5) + (1.49), (I-5) + (1.50), (I-5) + (1.51), (I-5) + (1.52), (I-5) + (1.53), (I-5) + (1.54), (I-5) + (1.55), (I-5) + (1.56), (I-5) + (1.57), (I-5) + (1.58), (I-5) + (1.59), (I-5) + (1.60), (I-5) + (1.61), (I-5) + (1.62), (I-5) + (1.63), (I-5) + (1.64), (I-5) + (2.1), (I-5) + (2.2), (I-5) + (2.3), (I-5) + (2.4), (I-5) + (2.5), (I-5) + (2.6), (I-5) + (2.7), (I-5) + (2.8), (I-5) + (2.9), (I-5) + (2.10), (I-5) + (2.11), (I-5) + (2.12), (I-5) + (2.13), (I-5) + (2.14), (I-5) + (2.15), (I-5) + (2.16), (I-5) + (2.17), (I-5) + (2.18), (I-5) + (2.19), (I-5) + (2.20), (I-5) + (2.21), (I-5) + (2.22), (I-5) + (2.23), (I-5) + (2.24), (I-5) + (2.25), (I-5) + (2.26), (I-5) + (2.27), (I-5) + (2.28), (I-5) + (2.29), (I-5) + (3.1), (I-5) + (3.2), (I-5) + (3.3), (I-5) + (3.4), (I-5) + (3.5), (I-5) + (3.6), (I-5) + (3.7), (I-5) + (3.8), (I-5) + (3.9), (I-5) + (3.10), (I-5) + (3.11), (I-5) + (3.12), (I-5) + (3.13), (I-5) + (3.14), (I-5) + (3.15), (I-5) + (3.16), (I-5) + (3.17), (I-5) + (3.18), (I-5) + (3.19), (I-5) + (3.20), (I-5) + (3.21), (I-5) + (3.22), (I-5) + (3.23), (I-5) + (3.24), (I-5) + (3.25), (I-5) + (3.26), (I-5) + (3.27), (I-5) + (3.28), (I-5) + (3.29), (I-5) + (3.30), (I-5) + (3.31), (I-5) + (3.32), (I-5) + (3.33), (I-5) + (4.1), (I-5) + (4.2), (I-5) + (4.3), (I-5) + (4.4), (I-5) + (4.5), (I-5) + (4.6), (I-5) + (4.7), (I-5) + (4.8), (I-5) + (4.9), (I-5) + (4.10), (I-5) + (4.11), (I-5) + (4.12), (I-5) + (4.13), (I-5) + (4.14), (I-5) + (5.1), (I-5) + (5.2), (I-5) + (5.3), (I-5) + (5.4), (I-5) + (5.5), (I-5) + (5.6), (I-5) + (5.7), (I-5) + (5.8), (I-5) + (5.9), (I-5) + (5.10), (I-5) + (5.11), (I-5) + (5.12), (I-5) + (5.13), (I-5) + (5.14), (I-5) + (5.15), (I-5) + (5.16), (I-5) + (5.17), (I-5) + (5.18), (I-5) + (5.19), (I-5) + (5.20), (I-5) + (5.21), (I-5) + (5.22), (I-5) + (5.23), (I-5) + (5.24), (I-5) + (5.25), (I-5) + (5.26), (I-5) + (5.27), (I-5) + (5.28), (I-5) + (5.29), (I-5) + (5.30), (I-5) + (5.31), (I-5) + (5.32), (I-5) + (5.33), (I-5) + (5.34), (I-5) + (6.1), (I-5) + (6.2), (I-5) + (6.3), (I-5) + (6.4), (I-5) + (7.1), (I-5) + (7.2), (I-5) + (7.3), (I-5) + (7.4), (I-5) + (7.5), (I-5) + (7.6), (I-5) + (7.7), (I-5) + (7.8), (I-5) + (8.1), (I-5) + (8.2), (I-5) + (8.3), (I-5) + (8.4), (I-5) + (9.1), (I-5) + (9.2), (I-5) + (9.3), (I-5) + (9.4), (I-5) + (9.5), (I-5) + (9.6), (I-5) + (9.7), (I-5) + (9.8), (I-5) + (9.9), (I-5) + (10.1), (I-5) + (10.2), (I-5) + (10.3), (I-5) + (10.4), (I-5) + (10.5), (I-5) + (10.6), (I-5) + (10.7), (I-5) + (10.8), (I-5) + (10.9), (I-5) + (10.10), (I-5) + (10.11), (I-5) + (10.12), (I-5) + (10.13), (I-5) + (10.14), (I-5) + (10.15), (I-5) + (11.1), (I-5) + (11.2), (I-5) + (11.3), (I-5) + (11.4), (I-5) + (11.5), (I-5) + (11.6), (I-5) + (11.7), (I-5) + (12.1), (I-5) + (12.2), (I-5) + (12.3), (I-5) + (12.4), (I-5) + (12.5), (I-5) + (12.6), (I-5) + (12.7), (I-5) + (12.8), (I-5) + (12.9), (I-5) + (12.10), (I-5) + (12.11), (I-5) + (12.12), (I-5) + (12.13), (I-5) + (13.1), (I-5) + (13.2), (I-5) + (13.3), (I-5) + (13.4), (I-5) + (13.5), (I-5) + (13.6), (I-5) + (13.7), (I-5) + (14.1), (I-5) + (14.2), (I-5) + (14.3), (I-5) + (14.4), (I-5) + (14.5), (I-5) + (15.1), (I-5) + (15.2), (I-5) + (15.3), (I-5) + (15.4), (I-5) + (15.5), (I-5) + (15.6), (I-5) + (15.7), (I-5) + (15.8), (I-5) + (15.9), (I-5) + (15.10), (I-5) + (15.11), (I-5) + (15.12), (I-5) + (15.13), (I-5) + (15.14), (I-5) + (15.15), (I-5) + (15.16), (I-5) + (15.17), (I-5) + (15.18), (I-5) + (15.19), (I-5) + (15.20), (I-5) + (15.21), (I-5) + (15.22), (I-5) + (15.23), (I-5) + (15.24), (I-5) + (15.25), (I-5) + (15.26), (I-5) + (15.27), (I-5) + (15.28), (I-5) + (15.29), (I-5) + (15.30), (I-5) + (15.31), (I-5) + (15.32), (I-5) + (15.33), (I-5) + (15.34), (I-5) + (15.35), (I-5) + (15.36), (I-

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5) + (15.37), (I-5) + (15.38), (I-5) + (15.39), (I-5) + (15.41), (I-5) + (15.42), (I-5) + (15.43), (I-5) + (15.44), (I-5) + (15.45), (I-5) + (15.46), (I-5) + (15.47), (I-5) + (15.48), (I-5) + (15.49), (I-5) + (15.50), (I-5) + (15.51), (I-5) + (15.52), (I-5) + (15.53), (I-5) + (15.54), (I-5) + (15.55), (I-5) + (15.56), (I-5) + (15.57), (I-5) + (15.58), (I-5) + (15.59), (I-5) + (15.60), (I-5) + (15.61), (I-5) + (15.62), (I-5) + (15.63), (I-5) + (15.64), (I-5) + (15.65), (I-5) + (15.66), (I-5) + (15.67), (I-5) + (15.68), (I-5) + (15.69), (I-5) + (15.70), (I-5) + (15.71), (I-5) + (15.72), (I-5) + (15.73), (I-5) + (15.74), (I-5) + (15.75), (I-5) + (15.76), (I-5) + (15.77), (I-5) + (15.78), (I-5) + (15.79), (I-5) + (15.80), (I-5) + (15.81), (I-5) + (15.82), (I-5) + (15.83), (I-5) + (15.84), (I-5) + (15.85), (I-5) + (15.86), (I-5) + (15.87), (I-5) + (15.88), (I-5) + (15.89), (I-5) + (15.90), (I-5) + (15.91), (I-5) + (15.92), (I-5) + (15.93), (I-5) + (15.94).

In a further particularly preferred embodiment this invention is directed to mixtures comprising the compound (I-5) as compound of formula (I) and one component (B), in particular the mixtures (I-5) + (2.1), (I-5) + (2.2), (I-5) + (2.6), (I-5) + (2.8), (I-5) + (2.11), (I-5) + (2.12), (I-5) + (2.13), (I-5) + (2.14), (I-5) + (2.15), (I-5) + (2.16), (I-5) + (2.17), (I-5) + (2.29), (I-5) + (3.1), (I-5) + (3.2), (I-5) + (3.3), (I-5) + (3.4), (I-5) + (3.9), (I-5) + (3.10), (I-5) + (3.12), (I-5) + (3.16), (I-5) + (3.17), (I-5) + (3.22), (I-5) + (4.6), (I-5) + (5.1), (I-5) + (5.4), (I-5) + (5.5), (I-5) + (5.7), (I-5) + (5.8), (I-5) + (5.9), (I-5) + (5.16), (I-5) + (5.23), (I-5) + (5.25), (I-5) + (5.26), (I-5) + (5.29), (I-5) + (5.30), (I-5) + (7.7), (I-5) + (9.2), (I-5) + (9.4), (I-5) + (9.5), (I-5) + (10.9), (I-5) + (10.10), (I-5) + (12.9), (I-5) + (12.10), (I-5) + (14.4), (I-5) + (15.9), (I-5) + (15.24), (I-5) + (15.25), (I-5) + (15.26), (I-5) + (15.41), (I-5) + (15.42), (I-5) + (15.54), (I-5) + (15.55), (I-5) + (15.56), (I-5) + (15.60), (I-5) + (15.90).

In a preferred embodiment this invention is directed to mixtures comprising the compound (I-6) as compound of formula (I) and one component (B), in particular the mixtures (I-6) + (1.1), (I-6) + (1.2), (I-6) + (1.3), (I-6) + (1.4), (I-6) + (1.5), (I-6) + (1.6), (I-6) + (1.7), (I-6) + (1.8), (I-6) + (1.9), (I-6) + (1.10), (I-6) + (1.11), (I-6) + (1.12), (I-6) + (1.13), (I-6) + (1.14), (I-6) + (1.15), (I-6) + (1.16), (I-6) + (1.17), (I-6) + (1.18), (I-6) + (1.19), (I-6) + (1.20), (I-6) + (1.21), (I-6) + (1.22), (I-6) + (1.23), (I-6) + (1.24), (I-6) + (1.25), (I-6) + (1.26), (I-6) + (1.27), (I-6) + (1.28), (I-6) + (1.29), (I-6) + (1.30), (I-6) + (1.31), (I-6) + (1.32), (I-6) + (1.33), (I-6) + (1.34), (I-6) + (1.35), (I-6) + (1.36), (I-6) + (1.37), (I-6) + (1.38), (I-6) + (1.39), (I-6) + (1.40), (I-6) + (1.41), (I-6) + (1.42), (I-6) + (1.43), (I-6) + (1.44), (I-6) + (1.45), (I-6) + (1.46), (I-6) + (1.47), (I-6) + (1.48), (I-6) + (1.49), (I-6) + (1.50), (I-6) + (1.51), (I-6) + (1.52), (I-6) + (1.53), (I-6) + (1.54), (I-6) + (1.55), (I-6) + (1.56), (I-6) + (1.57), (I-6) + (1.58), (I-6) + (1.59), (I-6) + (1.60), (I-6) + (1.61), (I-6) + (1.62), (I-6) + (1.63), (I-6) + (1.64), (I-6) + (2.1), (I-6) + (2.2), (I-6) + (2.3), (I-6) + (2.4), (I-6) + (2.5), (I-6) + (2.6), (I-6) + (2.7), (I-6) + (2.8), (I-6) + (2.9), (I-6) + (2.10), (I-6) + (2.11), (I-6) + (2.12), (I-6) + (2.13), (I-6) + (2.14), (I-6) + (2.15), (I-6) + (2.16), (I-6) + (2.17), (I-6) + (2.18), (I-6) + (2.19), (I-6) + (2.20), (I-6) + (2.21), (I-6) + (2.22), (I-6) + (2.23), (I-6) + (2.24), (I-6) + (2.25), (I-6) + (2.26), (I-

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6) + (2.27), (I-6) + (2.28), (I-6) + (2.29), (I-6) + (3.1), (I-6) + (3.2), (I-6) + (3.3), (I-6) + (3.4), (I-6) + (3.5), (I-6) + (3.6), (I-6) + (3.7), (I-6) + (3.8), (I-6) + (3.9), (I-6) + (3.10), (I-6) + (3.11), (I-6) + (3.12), (I-6) + (3.13), (I-6) + (3.14), (I-6) + (3.15), (I-6) + (3.16), (I-6) + (3.17), (I-6) + (3.18), (I-6) + (3.19), (I-6) + (3.20), (I-6) + (3.21), (I-6) + (3.22), (I-6) + (3.23), (I-6) + (3.24), (I-6) + (3.25), (I-6) + (3.26), (I-6) + (3.27), (I-6) + (3.28), (I-6) + (3.29), (I-6) + (3.30), (I-6) + (3.31), (I-6) + (3.32), (I-6) + (3.33), (I-6) + (4.1), (I-6) + (4.2), (I-6) + (4.3), (I-6) + (4.4), (I-6) + (4.5), (I-6) + (4.6), (I-6) + (4.7), (I-6) + (4.8), (I-6) + (4.9), (I-6) + (4.10), (I-6) + (4.11), (I-6) + (4.12), (I-6) + (4.13), (I-6) + (4.14), (I-6) + (5.1), (I-6) + (5.2), (I-6) + (5.3), (I-6) + (5.4), (I-6) + (5.5), (I-6) + (5.6), (I-6) + (5.7), (I-6) + (5.8), (I-6) + (5.9), (I-6) + (5.10), (I-6) + (5.11), (I-6) + (5.12), (I-6) + (5.13), (I-6) + (5.14), (I-6) + (5.15), (I-6) + (5.16), (I-6) + (5.17), (I-6) + (5.18), (I-6) + (5.19), (I-6) + (5.20), (I-6) + (5.21), (I-6) + (5.22), (I-6) + (5.23), (I-6) + (5.24), (I-6) + (5.25), (I-6) + (5.26), (I-6) + (5.27), (I-6) + (5.28), (I-6) + (5.29), (I-6) + (5.30), (I-6) + (5.31), (I-6) + (5.32), (I-6) + (5.33), (I-6) + (5.34), (I-6) + (6.1), (I-6) + (6.2), (I-6) + (6.3), (I-6) + (6.4), (I-6) + (7.1), (I-6) + (7.2), (I-6) + (7.3), (I-6) + (7.4), (I-6) + (7.5), (I-6) + (7.6), (I-6) + (7.7), (I-6) + (7.8), (I-6) + (8.1), (I-6) + (8.2), (I-6) + (8.3), (I-6) + (8.4), (I-6) + (9.1), (I-6) + (9.2), (I-6) + (9.3), (I-6) + (9.4), (I-6) + (9.5), (I-6) + (9.6), (I-6) + (9.7), (I-6) + (9.8), (I-6) + (9.9), (I-6) + (10.1), (I-6) + (10.2), (I-6) + (10.3), (I-6) + (10.4), (I-6) + (10.5), (I-6) + (10.6), (I-6) + (10.7), (I-6) + (10.8), (I-6) + (10.9), (I-6) + (10.10), (I-6) + (10.11), (I-6) + (10.12), (I-6) + (10.13), (I-6) + (10.14), (I-6) + (10.15), (I-6) + (11.1), (I-6) + (11.2), (I-6) + (11.3), (I-6) + (11.4), (I-6) + (11.5), (I-6) + (11.6), (I-6) + (11.7), (I-6) + (12.1), (I-6) + (12.2), (I-6) + (12.3), (I-6) + (12.4), (I-6) + (12.5), (I-6) + (12.6), (I-6) + (12.7), (I-6) + (12.8), (I-6) + (12.9), (I-6) + (12.10), (I-6) + (12.11), (I-6) + (12.12), (I-6) + (12.13), (I-6) + (13.1), (I-6) + (13.2), (I-6) + (13.3), (I-6) + (13.4), (I-6) + (13.5), (I-6) + (13.6), (I-6) + (13.7), (I-6) + (14.1), (I-6) + (14.2), (I-6) + (14.3), (I-6) + (14.4), (I-6) + (14.5), (I-6) + (15.1), (I-6) + (15.2), (I-6) + (15.3), (I-6) + (15.4), (I-6) + (15.5), (I-6) + (15.6), (I-6) + (15.7), (I-6) + (15.8), (I-6) + (15.9), (I-6) + (15.10), (I-6) + (15.11), (I-6) + (15.12), (I-6) + (15.13), (I-6) + (15.14), (I-6) + (15.15), (I-6) + (15.16), (I-6) + (15.17), (I-6) + (15.18), (I-6) + (15.19), (I-6) + (15.20), (I-6) + (15.21), (I-6) + (15.22), (I-6) + (15.23), (I-6) + (15.24), (I-6) + (15.25), (I-6) + (15.26), (I-6) + (15.27), (I-6) + (15.28), (I-6) + (15.29), (I-6) + (15.30), (I-6) + (15.31), (I-6) + (15.32), (I-6) + (15.33), (I-6) + (15.34), (I-6) + (15.35), (I-6) + (15.36), (I-6) + (15.37), (I-6) + (15.38), (I-6) + (15.39), (I-6) + (15.41), (I-6) + (15.42), (I-6) + (15.43), (I-6) + (15.44), (I-6) + (15.45), (I-6) + (15.46), (I-6) + (15.47), (I-6) + (15.48), (I-6) + (15.49), (I-6) + (15.50), (I-6) + (15.51), (I-6) + (15.52), (I-6) + (15.53), (I-6) + (15.54), (I-6) + (15.55), (I-6) + (15.56), (I-6) + (15.57), (I-6) + (15.58), (I-6) + (15.59), (I-6) + (15.60), (I-6) + (15.61), (I-6) + (15.62), (I-6) + (15.63), (I-6) + (15.64), (I-6) + (15.65), (I-6) + (15.66), (I-6) + (15.67), (I-6) + (15.68), (I-6) + (15.69), (I-6) + (15.70), (I-6) + (15.71), (I-6) + (15.72), (I-6) + (15.73), (I-6) + (15.74), (I-6) + (15.75), (I-6) + (15.76), (I-6) + (15.77), (I-6) + (15.78), (I-6) + (15.79), (I-6) + (15.80), (I-6) + (15.81), (I-6) + (15.82), (I-6) + (15.83), (I-6) + (15.84), (I-6) + (15.85), (I-6) + (15.86), (I-

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6) + (15.87), (I-6) + (15.88), (I-6) + (15.89), (I-6) + (15.90), (I-6) + (15.91), (I-6) + (15.92), (I-6) + (15.93), (I-6) + (15.94).

In a further particularly preferred embodiment this invention is directed to mixtures comprising the compound (I-6) as compound of formula (I) and one component (B), in particular the mixtures (I-6) + (2.1), (I-6) + (2.2), (I-6) + (2.6), (I-6) + (2.8), (I-6) + (2.11), (I-6) + (2.12), (I-6) + (2.13), (I-6) + (2.14), (I-6) + (2.15), (I-6) + (2.16), (I-6) + (2.17), (I-6) + (2.29), (I-6) + (3.1), (I-6) + (3.2), (I-6) + (3.3), (I-6) + (3.4), (I-6) + (3.9), (I-6) + (3.10), (I-6) + (3.12), (I-6) + (3.16), (I-6) + (3.17), (I-6) + (3.22), (I-6) + (4.6), (I-6) + (5.1), (I-6) + (5.4), (I-6) + (5.5), (I-6) + (5.7), (I-6) + (5.8), (I-6) + (5.9), (I-6) + (5.16), (I-6) + (5.23), (I-6) + (5.25), (I-6) + (5.26), (I-6) + (5.29), (I-6) + (5.30), (I-6) + (7.7), (I-6) + (9.2), (I-6) + (9.4), (I-6) + (9.5), (I-6) + (10.9), (I-6) + (10.10), (I-6) + (12.9), (I-6) + (12.10), (I-6) + (14.4), (I-6) + (15.9), (I-6) + (15.24), (I-6) + (15.25), (I-6) + (15.26), (I-6) + (15.41), (I-6) + (15.42), (I-6) + (15.54), (I-6) + (15.55), (I-6) + (15.56), (I-6) + (15.60), (I-6) + (15.90).

In a preferred embodiment this invention is directed to mixtures comprising the compound (I-7) as compound of formula (I) and one component (B), in particular the mixtures (I-7) + (1.1), (I-7) + (1.2), (I-7) + (1.3), (I-7) + (1.4), (I-7) + (1.5), (I-7) + (1.6), (I-7) + (1.7), (I-7) + (1.8), (I-7) + (1.9), (I-7) + (1.10), (I-7) + (1.11), (I-7) + (1.12), (I-7) + (1.13), (I-7) + (1.14), (I-7) + (1.15), (I-7) + (1.16), (I-7) + (1.17), (I-7) + (1.18), (I-7) + (1.19), (I-7) + (1.20), (I-7) + (1.21), (I-7) + (1.22), (I-7) + (1.23), (I-7) + (1.24), (I-7) + (1.25), (I-7) + (1.26), (I-7) + (1.27), (I-7) + (1.28), (I-7) + (1.29), (I-7) + (1.30), (I-7) + (1.31), (I-7) + (1.32), (I-7) + (1.33), (I-7) + (1.34), (I-7) + (1.35), (I-7) + (1.36), (I-7) + (1.37), (I-7) + (1.38), (I-7) + (1.39), (I-7) + (1.40), (I-7) + (1.41), (I-7) + (1.42), (I-7) + (1.43), (I-7) + (1.44), (I-7) + (1.45), (I-7) + (1.46), (I-7) + (1.47), (I-7) + (1.48), (I-7) + (1.49), (I-7) + (1.50), (I-7) + (1.51), (I-7) + (1.52), (I-7) + (1.53), (I-7) + (1.54), (I-7) + (1.55), (I-7) + (1.56), (I-7) + (1.57), (I-7) + (1.58), (I-7) + (1.59), (I-7) + (1.60), (I-7) + (1.61), (I-7) + (1.62), (I-7) + (1.63), (I-7) + (1.64), (I-7) + (2.1), (I-7) + (2.2), (I-7) + (2.3), (I-7) + (2.4), (I-7) + (2.5), (I-7) + (2.6), (I-7) + (2.7), (I-7) + (2.8), (I-7) + (2.9), (I-7) + (2.10), (I-7) + (2.11), (I-7) + (2.12), (I-7) + (2.13), (I-7) + (2.14), (I-7) + (2.15), (I-7) + (2.16), (I-7) + (2.17), (I-7) + (2.18), (I-7) + (2.19), (I-7) + (2.20), (I-7) + (2.21), (I-7) + (2.22), (I-7) + (2.23), (I-7) + (2.24), (I-7) + (2.25), (I-7) + (2.26), (I-7) + (2.27), (I-7) + (2.28), (I-7) + (2.29), (I-7) + (3.1), (I-7) + (3.2), (I-7) + (3.3), (I-7) + (3.4), (I-7) + (3.5), (I-7) + (3.6), (I-7) + (3.7), (I-7) + (3.8), (I-7) + (3.9), (I-7) + (3.10), (I-7) + (3.11), (I-7) + (3.12), (I-7) + (3.13), (I-7) + (3.14), (I-7) + (3.15), (I-7) + (3.16), (I-7) + (3.17), (I-7) + (3.18), (I-7) + (3.19), (I-7) + (3.20), (I-7) + (3.21), (I-7) + (3.22), (I-7) + (3.23), (I-7) + (3.24), (I-7) + (3.25), (I-7) + (3.26), (I-7) + (3.27), (I-7) + (3.28), (I-7) + (3.29), (I-7) + (3.30), (I-7) + (3.31), (I-7) + (3.32), (I-7) + (3.33), (I-7) + (4.1), (I-7) + (4.2), (I-7) + (4.3), (I-7) + (4.4), (I-7) + (4.5), (I-7) + (4.6), (I-7) + (4.7), (I-7) + (4.8), (I-7) + (4.9), (I-7) + (4.10), (I-7) + (4.11), (I-7) + (4.12), (I-7) + (4.13), (I-7) + (4.14), (I-7) + (5.1), (I-7) + (5.2), (I-7) + (5.3), (I-7) + (5.4), (I-

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7) + (5.5), (I-7) + (5.6), (I-7) + (5.7), (I-7) + (5.8), (I-7) + (5.9), (I-7) + (5.10), (I-7) + (5.11), (I-7) + (5.12), (I-7) + (5.13), (I-7) + (5.14), (I-7) + (5.15), (I-7) + (5.16), (I-7) + (5.17), (I-7) + (5.18), (I-7) + (5.19), (I-7) + (5.20), (I-7) + (5.21), (I-7) + (5.22), (I-7) + (5.23), (I-7) + (5.24), (I-7) + (5.25), (I-7) + (5.26), (I-7) + (5.27), (I-7) + (5.28), (I-7) + (5.29), (I-7) + (5.30), (I-7) + (5.31), (I-7) + (5.32), (I-7) + (5.33), (I-7) + (5.34), (I-7) + (6.1), (I-7) + (6.2), (I-7) + (6.3), (I-7) + (6.4), (I-7) + (7.1), (I-7) + (7.2), (I-7) + (7.3), (I-7) + (7.4), (I-7) + (7.5), (I-7) + (7.6), (I-7) + (7.7), (I-7) + (7.8), (I-7) + (8.1), (I-7) + (8.2), (I-7) + (8.3), (I-7) + (8.4), (I-7) + (9.1), (I-7) + (9.2), (I-7) + (9.3), (I-7) + (9.4), (I-7) + (9.5), (I-7) + (9.6), (I-7) + (9.7), (I-7) + (9.8), (I-7) + (9.9), (I-7) + (10.1), (I-7) + (10.2), (I-7) + (10.3), (I-7) + (10.4), (I-7) + (10.5), (I-7) + (10.6), (I-7) + (10.7), (I-7) + (10.8), (I-7) + (10.9), (I-7) + (10.10), (I-7) + (10.11), (I-7) + (10.12), (I-7) + (10.13), (I-7) + (10.14), (I-7) + (10.15), (I-7) + (11.1), (I-7) + (11.2), (I-7) + (11.3), (I-7) + (11.4), (I-7) + (11.5), (I-7) + (11.6), (I-7) + (11.7), (I-7) + (12.1), (I-7) + (12.2), (I-7) + (12.3), (I-7) + (12.4), (I-7) + (12.5), (I-7) + (12.6), (I-7) + (12.7), (I-7) + (12.8), (I-7) + (12.9), (I-7) + (12.10), (I-7) + (12.11), (I-7) + (12.12), (I-7) + (12.13), (I-7) + (13.1), (I-7) + (13.2), (I-7) + (13.3), (I-7) + (13.4), (I-7) + (13.5), (I-7) + (13.6), (I-7) + (13.7), (I-7) + (14.1), (I-7) + (14.2), (I-7) + (14.3), (I-7) + (14.4), (I-7) + (14.5), (I-7) + (15.1), (I-7) + (15.2), (I-7) + (15.3), (I-7) + (15.4), (I-7) + (15.5), (I-7) + (15.6), (I-7) + (15.7), (I-7) + (15.8), (I-7) + (15.9), (I-7) + (15.10), (I-7) + (15.11), (I-7) + (15.12), (I-7) + (15.13), (I-7) + (15.14), (I-7) + (15.15), (I-7) + (15.16), (I-7) + (15.17), (I-7) + (15.18), (I-7) + (15.19), (I-7) + (15.20), (I-7) + (15.21), (I-7) + (15.22), (I-7) + (15.23), (I-7) + (15.24), (I-7) + (15.25), (I-7) + (15.26), (I-7) + (15.27), (I-7) + (15.28), (I-7) + (15.29), (I-7) + (15.30), (I-7) + (15.31), (I-7) + (15.32), (I-7) + (15.33), (I-7) + (15.34), (I-7) + (15.35), (I-7) + (15.36), (I-7) + (15.37), (I-7) + (15.38), (I-7) + (15.39), (I-7) + (15.41), (I-7) + (15.42), (I-7) + (15.43), (I-7) + (15.44), (I-7) + (15.45), (I-7) + (15.46), (I-7) + (15.47), (I-7) + (15.48), (I-7) + (15.49), (I-7) + (15.50), (I-7) + (15.51), (I-7) + (15.52), (I-7) + (15.53), (I-7) + (15.54), (I-7) + (15.55), (I-7) + (15.56), (I-7) + (15.57), (I-7) + (15.58), (I-7) + (15.59), (I-7) + (15.60), (I-7) + (15.61), (I-7) + (15.62), (I-7) + (15.63), (I-7) + (15.64), (I-7) + (15.65), (I-7) + (15.66), (I-7) + (15.67), (I-7) + (15.68), (I-7) + (15.69), (I-7) + (15.70), (I-7) + (15.71), (I-7) + (15.72), (I-7) + (15.73), (I-7) + (15.74), (I-7) + (15.75), (I-7) + (15.76), (I-7) + (15.77), (I-7) + (15.78), (I-7) + (15.79), (I-7) + (15.80), (I-7) + (15.81), (I-7) + (15.82), (I-7) + (15.83), (I-7) + (15.84), (I-7) + (15.85), (I-7) + (15.86), (I-7) + (15.87), (I-7) + (15.88), (I-7) + (15.89), (I-7) + (15.90), (I-7) + (15.91), (I-7) + (15.92), (I-7) + (15.93), (I-7) + (15.94).

In a further particularly preferred embodiment this invention is directed to mixtures comprising the compound (I-7) as compound of formula (I) and one component (B), in particular the mixtures (I-7) + (2.1), (I-7) + (2.2), (I-7) + (2.6), (I-7) + (2.8), (I-7) + (2.11), (I-7) + (2.12), (I-7) + (2.13), (I-7) + (2.14), (I-7) + (2.15), (I-7) + (2.16), (I-7) + (2.17), (I-7) + (2.29), (I-7) + (3.1), (I-7) + (3.2), (I-7) + (3.3), (I-7) + (3.4), (I-7) + (3.9), (I-7) + (3.10), (I-7) + (3.12), (I-7) + (3.16), (I-7) + (3.17), (I-7) + (3.22), (I-7) + (4.6), (I-7) + (5.1), (I-7) + (5.4), (I-7) + (5.5), (I-

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7) + (5.7), (I-7) + (5.8), (I-7) + (5.9), (I-7) + (5.16), (I-7) + (5.23), (I-7) + (5.25), (I-7) + (5.26), (I-7) + (5.29), (I-7) + (5.30), (I-7) + (7.7), (I-7) + (9.2), (I-7) + (9.4), (I-7) + (9.5), (I-7) + (10.9), (I-7) + (10.10), (I-7) + (12.9), (I-7) + (12.10), (I-7) + (14.4), (I-7) + (15.9), (I-7) + (15.24), (I-7) + (15.25), (I-7) + (15.26), (I-7) + (15.41), (I-7) + (15.42), (I-7) + (15.54), (I-7) + (15.55), (I-7) + (15.56), (I-7) + (15.60), (I-7) + (15.90).

In a preferred embodiment this invention is directed to mixtures comprising the compound (I-8) as compound of formula (I) and one component (B), in particular the mixtures (I-8) + (1.1), (I-8) + (1.2), (I-8) + (1.3), (I-8) + (1.4), (I-8) + (1.5), (I-8) + (1.6), (I-8) + (1.7), (I-8) + (1.8), (I-8) + (1.9), (I-8) + (1.10), (I-8) + (1.11), (I-8) + (1.12), (I-8) + (1.13), (I-8) + (1.14), (I-8) + (1.15), (I-8) + (1.16), (I-8) + (1.17), (I-8) + (1.18), (I-8) + (1.19), (I-8) + (1.20), (I-8) + (1.21), (I-8) + (1.22), (I-8) + (1.23), (I-8) + (1.24), (I-8) + (1.25), (I-8) + (1.26), (I-8) + (1.27), (I-8) + (1.28), (I-8) + (1.29), (I-8) + (1.30), (I-8) + (1.31), (I-8) + (1.32), (I-8) + (1.33), (I-8) + (1.34), (I-8) + (1.35), (I-8) + (1.36), (I-8) + (1.37), (I-8) + (1.38), (I-8) + (1.39), (I-8) + (1.40), (I-8) + (1.41), (I-8) + (1.42), (I-8) + (1.43), (I-8) + (1.44), (I-8) + (1.45), (I-8) + (1.46), (I-8) + (1.47), (I-8) + (1.48), (I-8) + (1.49), (I-8) + (1.50), (I-8) + (1.51), (I-8) + (1.52), (I-8) + (1.53), (I-8) + (1.54), (I-8) + (1.55), (I-8) + (1.56), (I-8) + (1.57), (I-8) + (1.58), (I-8) + (1.59), (I-8) + (1.60), (I-8) + (1.61), (I-8) + (1.62), (I-8) + (1.63), (I-8) + (1.64), (I-8) + (2.1), (I-8) + (2.2), (I-8) + (2.3), (I-8) + (2.4), (I-8) + (2.5), (I-8) + (2.6), (I-8) + (2.7), (I-8) + (2.8), (I-8) + (2.9), (I-8) + (2.10), (I-8) + (2.11), (I-8) + (2.12), (I-8) + (2.13), (I-8) + (2.14), (I-8) + (2.15), (I-8) + (2.16), (I-8) + (2.17), (I-8) + (2.18), (I-8) + (2.19), (I-8) + (2.20), (I-8) + (2.21), (I-8) + (2.22), (I-8) + (2.23), (I-8) + (2.24), (I-8) + (2.25), (I-8) + (2.26), (I-8) + (2.27), (I-8) + (2.28), (I-8) + (2.29), (I-8) + (3.1), (I-8) + (3.2), (I-8) + (3.3), (I-8) + (3.4), (I-8) + (3.5), (I-8) + (3.6), (I-8) + (3.7), (I-8) + (3.8), (I-8) + (3.9), (I-8) + (3.10), (I-8) + (3.11), (I-8) + (3.12), (I-8) + (3.13), (I-8) + (3.14), (I-8) + (3.15), (I-8) + (3.16), (I-8) + (3.17), (I-8) + (3.18), (I-8) + (3.19), (I-8) + (3.20), (I-8) + (3.21), (I-8) + (3.22), (I-8) + (3.23), (I-8) + (3.24), (I-8) + (3.25), (I-8) + (3.26), (I-8) + (3.27), (I-8) + (3.28), (I-8) + (3.29), (I-8) + (3.30), (I-8) + (3.31), (I-8) + (3.32), (I-8) + (3.33), (I-8) + (4.1), (I-8) + (4.2), (I-8) + (4.3), (I-8) + (4.4), (I-8) + (4.5), (I-8) + (4.6), (I-8) + (4.7), (I-8) + (4.8), (I-8) + (4.9), (I-8) + (4.10), (I-8) + (4.11), (I-8) + (4.12), (I-8) + (4.13), (I-8) + (4.14), (I-8) + (5.1), (I-8) + (5.2), (I-8) + (5.3), (I-8) + (5.4), (I-8) + (5.5), (I-8) + (5.6), (I-8) + (5.7), (I-8) + (5.8), (I-8) + (5.9), (I-8) + (5.10), (I-8) + (5.11), (I-8) + (5.12), (I-8) + (5.13), (I-8) + (5.14), (I-8) + (5.15), (I-8) + (5.16), (I-8) + (5.17), (I-8) + (5.18), (I-8) + (5.19), (I-8) + (5.20), (I-8) + (5.21), (I-8) + (5.22), (I-8) + (5.23), (I-8) + (5.24), (I-8) + (5.25), (I-8) + (5.26), (I-8) + (5.27), (I-8) + (5.28), (I-8) + (5.29), (I-8) + (5.30), (I-8) + (5.31), (I-8) + (5.32), (I-8) + (5.33), (I-8) + (5.34), (I-8) + (6.1), (I-8) + (6.2), (I-8) + (6.3), (I-8) + (6.4), (I-8) + (7.1), (I-8) + (7.2), (I-8) + (7.3), (I-8) + (7.4), (I-8) + (7.5), (I-8) + (7.6), (I-8) + (7.7), (I-8) + (7.8), (I-8) + (8.1), (I-8) + (8.2), (I-8) + (8.3), (I-8) + (8.4), (I-8) + (9.1), (I-8) + (9.2), (I-8) + (9.3), (I-8) + (9.4), (I-8) + (9.5), (I-8) + (9.6), (I-8) + (9.7), (I-8) + (9.8), (I-8) + (9.9), (I-8) + (10.1), (I-8) + (10.2), (I-8) + (10.3), (I-8) + (10.4), (I-8) + (10.5), (I-8) + (10.6),

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(I-8) + (10.7), (I-8) + (10.8), (I-8) + (10.9), (I-8) + (10.10), (I-8) + (10.11), (I-8) + (10.12), (I-8) + (10.13), (I-8) + (10.14), (I-8) + (10.15), (I-8) + (11.1), (I-8) + (11.2), (I-8) + (11.3), (I-8) + (11.4), (I-8) + (11.5), (I-8) + (11.6), (I-8) + (11.7), (I-8) + (12.1), (I-8) + (12.2), (I-8) + (12.3), (I-8) + (12.4), (I-8) + (12.5), (I-8) + (12.6), (I-8) + (12.7), (I-8) + (12.8), (I-8) + (12.9), (I-8) + (12.10), (I-8) + (12.11), (I-8) + (12.12), (I-8) + (12.13), (I-8) + (13.1), (I-8) + (13.2), (I-8) + (13.3), (I-8) + (13.4), (I-8) + (13.5), (I-8) + (13.6), (I-8) + (13.7), (I-8) + (14.1), (I-8) + (14.2), (I-8) + (14.3), (I-8) + (14.4), (I-8) + (14.5), (I-8) + (15.1), (I-8) + (15.2), (I-8) + (15.3), (I-8) + (15.4), (I-8) + (15.5), (I-8) + (15.6), (I-8) + (15.7), (I-8) + (15.8), (I-8) + (15.9), (I-8) + (15.10), (I-8) + (15.11), (I-8) + (15.12), (I-8) + (15.13), (I-8) + (15.14), (I-8) + (15.15), (I-8) + (15.16), (I-8) + (15.17), (I-8) + (15.18), (I-8) + (15.19), (I-8) + (15.20), (I-8) + (15.21), (I-8) + (15.22), (I-8) + (15.23), (I-8) + (15.24), (I-8) + (15.25), (I-8) + (15.26), (I-8) + (15.27), (I-8) + (15.28), (I-8) + (15.29), (I-8) + (15.30), (I-8) + (15.31), (I-8) + (15.32), (I-8) + (15.33), (I-8) + (15.34), (I-8) + (15.35), (I-8) + (15.36), (I-8) + (15.37), (I-8) + (15.38), (I-8) + (15.39), (I-8) + (15.41), (I-8) + (15.42), (I-8) + (15.43), (I-8) + (15.44), (I-8) + (15.45), (I-8) + (15.46), (I-8) + (15.47), (I-8) + (15.48), (I-8) + (15.49), (I-8) + (15.50), (I-8) + (15.51), (I-8) + (15.52), (I-8) + (15.53), (I-8) + (15.54), (I-8) + (15.55), (I-8) + (15.56), (I-8) + (15.57), (I-8) + (15.58), (I-8) + (15.59), (I-8) + (15.60), (I-8) + (15.61), (I-8) + (15.62), (I-8) + (15.63), (I-8) + (15.64), (I-8) + (15.65), (I-8) + (15.66), (I-8) + (15.67), (I-8) + (15.68), (I-8) + (15.69), (I-8) + (15.70), (I-8) + (15.71), (I-8) + (15.72), (I-8) + (15.73), (I-8) + (15.74), (I-8) + (15.75), (I-8) + (15.76), (I-8) + (15.77), (I-8) + (15.78), (I-8) + (15.79), (I-8) + (15.80), (I-8) + (15.81), (I-8) + (15.82), (I-8) + (15.83), (I-8) + (15.84), (I-8) + (15.85), (I-8) + (15.86), (I-8) + (15.87), (I-8) + (15.88), (I-8) + (15.89), (I-8) + (15.90), (I-8) + (15.91), (I-8) + (15.92), (I-8) + (15.93), (I-8) + (15.94).

In a further particularly preferred embodiment this invention is directed to mixtures comprising the compound (I-8) as compound of formula (I) and one component (B), in particular the mixtures (I-8) + (2.1), (I-8) + (2.2), (I-8) + (2.6), (I-8) + (2.8), (I-8) + (2.11), (I-8) + (2.12), (I-8) + (2.13), (I-8) + (2.14), (I-8) + (2.15), (I-8) + (2.16), (I-8) + (2.17), (I-8) + (2.29), (I-8) + (3.1), (I-8) + (3.2), (I-8) + (3.3), (I-8) + (3.4), (I-8) + (3.9), (I-8) + (3.10), (I-8) + (3.12), (I-8) + (3.16), (I-8) + (3.17), (I-8) + (3.22), (I-8) + (4.6), (I-8) + (5.1), (I-8) + (5.4), (I-8) + (5.5), (I-8) + (5.7), (I-8) + (5.8), (I-8) + (5.9), (I-8) + (5.16), (I-8) + (5.23), (I-8) + (5.25), (I-8) + (5.26), (I-8) + (5.29), (I-8) + (5.30), (I-8) + (7.7), (I-8) + (9.2), (I-8) + (9.4), (I-8) + (9.5), (I-8) + (10.9), (I-8) + (10.10), (I-8) + (12.9), (I-8) + (12.10), (I-8) + (14.4), (I-8) + (15.9), (I-8) + (15.24), (I-8) + (15.25), (I-8) + (15.26), (I-8) + (15.41), (I-8) + (15.42), (I-8) + (15.54), (I-8) + (15.55), (I-8) + (15.56), (I-8) + (15.60), (I-8) + (15.90).

In a preferred embodiment this invention is directed to mixtures comprising the compound (I-9) as compound of formula (I) and one component (B), in particular the mixtures (I-9) + (1.1), (I-9) + (1.2), (I-9) + (1.3), (I-9) + (1.4), (I-9) + (1.5), (I-9) + (1.6), (I-9) + (1.7), (I-9) + (1.8), (I-9) + (1.9), (I-9) + (1.10), (I-9) + (1.11), (I-

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9) + (1.12), (I-9) + (1.13), (I-9) + (1.14), (I-9) + (1.15), (I-9) + (1.16), (I-9) + (1.17), (I-9) + (1.18), (I-9) + (1.19), (I-9) + (1.20), (I-9) + (1.21), (I-9) + (1.22), (I-9) + (1.23), (I-9) + (1.24), (I-9) + (1.25), (I-9) + (1.26), (I-9) + (1.27), (I-9) + (1.28), (I-9) + (1.29), (I-9) + (1.30), (I-9) + (1.31), (I-9) + (1.32), (I-9) + (1.33), (I-9) + (1.34), (I-9) + (1.35), (I-9) + (1.36), (I-9) + (1.37), (I-9) + (1.38), (I-9) + (1.39), (I-9) + (1.40), (I-9) + (1.41), (I-9) + (1.42), (I-9) + (1.43), (I-9) + (1.44), (I-9) + (1.45), (I-9) + (1.46), (I-9) + (1.47), (I-9) + (1.48), (I-9) + (1.49), (I-9) + (1.50), (I-9) + (1.51), (I-9) + (1.52), (I-9) + (1.53), (I-9) + (1.54), (I-9) + (1.55), (I-9) + (1.56), (I-9) + (1.57), (I-9) + (1.58), (I-9) + (1.59), (I-9) + (1.60), (I-9) + (1.61), (I-9) + (1.62), (I-9) + (1.63), (I-9) + (1.64), (I-9) + (2.1), (I-9) + (2.2), (I-9) + (2.3), (I-9) + (2.4), (I-9) + (2.5), (I-9) + (2.6), (I-9) + (2.7), (I-9) + (2.8), (I-9) + (2.9), (I-9) + (2.10), (I-9) + (2.11), (I-9) + (2.12), (I-9) + (2.13), (I-9) + (2.14), (I-9) + (2.15), (I-9) + (2.16), (I-9) + (2.17), (I-9) + (2.18), (I-9) + (2.19), (I-9) + (2.20), (I-9) + (2.21), (I-9) + (2.22), (I-9) + (2.23), (I-9) + (2.24), (I-9) + (2.25), (I-9) + (2.26), (I-9) + (2.27), (I-9) + (2.28), (I-9) + (2.29), (I-9) + (3.1), (I-9) + (3.2), (I-9) + (3.3), (I-9) + (3.4), (I-9) + (3.5), (I-9) + (3.6), (I-9) + (3.7), (I-9) + (3.8), (I-9) + (3.9), (I-9) + (3.10), (I-9) + (3.11), (I-9) + (3.12), (I-9) + (3.13), (I-9) + (3.14), (I-9) + (3.15), (I-9) + (3.16), (I-9) + (3.17), (I-9) + (3.18), (I-9) + (3.19), (I-9) + (3.20), (I-9) + (3.21), (I-9) + (3.22), (I-9) + (3.23), (I-9) + (3.24), (I-9) + (3.25), (I-9) + (3.26), (I-9) + (3.27), (I-9) + (3.28), (I-9) + (3.29), (I-9) + (3.30), (I-9) + (3.31), (I-9) + (3.32), (I-9) + (3.33), (I-9) + (4.1), (I-9) + (4.2), (I-9) + (4.3), (I-9) + (4.4), (I-9) + (4.5), (I-9) + (4.6), (I-9) + (4.7), (I-9) + (4.8), (I-9) + (4.9), (I-9) + (4.10), (I-9) + (4.11), (I-9) + (4.12), (I-9) + (4.13), (I-9) + (4.14), (I-9) + (5.1), (I-9) + (5.2), (I-9) + (5.3), (I-9) + (5.4), (I-9) + (5.5), (I-9) + (5.6), (I-9) + (5.7), (I-9) + (5.8), (I-9) + (5.9), (I-9) + (5.10), (I-9) + (5.11), (I-9) + (5.12), (I-9) + (5.13), (I-9) + (5.14), (I-9) + (5.15), (I-9) + (5.16), (I-9) + (5.17), (I-9) + (5.18), (I-9) + (5.19), (I-9) + (5.20), (I-9) + (5.21), (I-9) + (5.22), (I-9) + (5.23), (I-9) + (5.24), (I-9) + (5.25), (I-9) + (5.26), (I-9) + (5.27), (I-9) + (5.28), (I-9) + (5.29), (I-9) + (5.30), (I-9) + (5.31), (I-9) + (5.32), (I-9) + (5.33), (I-9) + (5.34), (I-9) + (6.1), (I-9) + (6.2), (I-9) + (6.3), (I-9) + (6.4), (I-9) + (7.1), (I-9) + (7.2), (I-9) + (7.3), (I-9) + (7.4), (I-9) + (7.5), (I-9) + (7.6), (I-9) + (7.7), (I-9) + (7.8), (I-9) + (8.1), (I-9) + (8.2), (I-9) + (8.3), (I-9) + (8.4), (I-9) + (9.1), (I-9) + (9.2), (I-9) + (9.3), (I-9) + (9.4), (I-9) + (9.5), (I-9) + (9.6), (I-9) + (9.7), (I-9) + (9.8), (I-9) + (9.9), (I-9) + (10.1), (I-9) + (10.2), (I-9) + (10.3), (I-9) + (10.4), (I-9) + (10.5), (I-9) + (10.6), (I-9) + (10.7), (I-9) + (10.8), (I-9) + (10.9), (I-9) + (10.10), (I-9) + (10.11), (I-9) + (10.12), (I-9) + (10.13), (I-9) + (10.14), (I-9) + (10.15), (I-9) + (11.1), (I-9) + (11.2), (I-9) + (11.3), (I-9) + (11.4), (I-9) + (11.5), (I-9) + (11.6), (I-9) + (11.7), (I-9) + (12.1), (I-9) + (12.2), (I-9) + (12.3), (I-9) + (12.4), (I-9) + (12.5), (I-9) + (12.6), (I-9) + (12.7), (I-9) + (12.8), (I-9) + (12.9), (I-9) + (12.10), (I-9) + (12.11), (I-9) + (12.12), (I-9) + (12.13), (I-9) + (13.1), (I-9) + (13.2), (I-9) + (13.3), (I-9) + (13.4), (I-9) + (13.5), (I-9) + (13.6), (I-9) + (13.7), (I-9) + (14.1), (I-9) + (14.2), (I-9) + (14.3), (I-9) + (14.4), (I-9) + (14.5), (I-9) + (15.1), (I-9) + (15.2), (I-9) + (15.3), (I-9) + (15.4), (I-9) + (15.5), (I-9) + (15.6), (I-9) + (15.7), (I-9) + (15.8), (I-

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9) + (15.9), (I-9) + (15.10), (I-9) + (15.11), (I-9) + (15.12), (I-9) + (15.13), (I-9) + (15.14), (I-9) + (15.15), (I-9) + (15.16), (I-9) + (15.17), (I-9) + (15.18), (I-9) + (15.19), (I-9) + (15.20), (I-9) + (15.21), (I-9) + (15.22), (I-9) + (15.23), (I-9) + (15.24), (I-9) + (15.25), (I-9) + (15.26), (I-9) + (15.27), (I-9) + (15.28), (I-9) + (15.29), (I-9) + (15.30), (I-9) + (15.31), (I-9) + (15.32), (I-9) + (15.33), (I-9) + (15.34), (I-9) + (15.35), (I-9) + (15.36), (I-9) + (15.37), (I-9) + (15.38), (I-9) + (15.39), (I-9) + (15.41), (I-9) + (15.42), (I-9) + (15.43), (I-9) + (15.44), (I-9) + (15.45), (I-9) + (15.46), (I-9) + (15.47), (I-9) + (15.48), (I-9) + (15.49), (I-9) + (15.50), (I-9) + (15.51), (I-9) + (15.52), (I-9) + (15.53), (I-9) + (15.54), (I-9) + (15.55), (I-9) + (15.56), (I-9) + (15.57), (I-9) + (15.58), (I-9) + (15.59), (I-9) + (15.60), (I-9) + (15.61), (I-9) + (15.62), (I-9) + (15.63), (I-9) + (15.64), (I-9) + (15.65), (I-9) + (15.66), (I-9) + (15.67), (I-9) + (15.68), (I-9) + (15.69), (I-9) + (15.70), (I-9) + (15.71), (I-9) + (15.72), (I-9) + (15.73), (I-9) + (15.74), (I-9) + (15.75), (I-9) + (15.76), (I-9) + (15.77), (I-9) + (15.78), (I-9) + (15.79), (I-9) + (15.80), (I-9) + (15.81), (I-9) + (15.82), (I-9) + (15.83), (I-9) + (15.84), (I-9) + (15.85), (I-9) + (15.86), (I-9) + (15.87), (I-9) + (15.88), (I-9) + (15.89), (I-9) + (15.90), (I-9) + (15.91), (I-9) + (15.92), (I-9) + (15.93), (I-9) + (15.94).

In a further particularly preferred embodiment this invention is directed to mixtures comprising the compound (I-9) as compound of formula (I) and one component (B), in particular the mixtures (I-9) + (2.1), (I-9) + (2.2), (I-9) + (2.6), (I-9) + (2.8), (I-9) + (2.11), (I-9) + (2.12), (I-9) + (2.13), (I-9) + (2.14), (I-9) + (2.15), (I-9) + (2.16), (I-9) + (2.17), (I-9) + (2.29), (I-9) + (3.1), (I-9) + (3.2), (I-9) + (3.3), (I-9) + (3.4), (I-9) + (3.9), (I-9) + (3.10), (I-9) + (3.12), (I-9) + (3.16), (I-9) + (3.17), (I-9) + (3.22), (I-9) + (4.6), (I-9) + (5.1), (I-9) + (5.4), (I-9) + (5.5), (I-9) + (5.7), (I-9) + (5.8), (I-9) + (5.9), (I-9) + (5.16), (I-9) + (5.23), (I-9) + (5.25), (I-9) + (5.26), (I-9) + (5.29), (I-9) + (5.30), (I-9) + (7.7), (I-9) + (9.2), (I-9) + (9.4), (I-9) + (9.5), (I-9) + (10.9), (I-9) + (10.10), (I-9) + (12.9), (I-9) + (12.10), (I-9) + (14.4), (I-9) + (15.9), (I-9) + (15.24), (I-9) + (15.25), (I-9) + (15.26), (I-9) + (15.41), (I-9) + (15.42), (I-9) + (15.54), (I-9) + (15.55), (I-9) + (15.56), (I-9) + (15.60), (I-9) + (15.90).

In a preferred embodiment this invention is directed to mixtures comprising the compound (I-10) as compound of formula (I) and one component (B), in particular the mixtures (I-10) + (1.1), (I-10) + (1.2), (I-10) + (1.3), (I-10) + (1.4), (I-10) + (1.5), (I-10) + (1.6), (I-10) + (1.7), (I-10) + (1.8), (I-10) + (1.9), (I-10) + (1.10), (I-10) + (1.11), (I-10) + (1.12), (I-10) + (1.13), (I-10) + (1.14), (I-10) + (1.15), (I-10) + (1.16), (I-10) + (1.17), (I-10) + (1.18), (I-10) + (1.19), (I-10) + (1.20), (I-10) + (1.21), (I-10) + (1.22), (I-10) + (1.23), (I-10) + (1.24), (I-10) + (1.25), (I-10) + (1.26), (I-10) + (1.27), (I-10) + (1.28), (I-10) + (1.29), (I-10) + (1.30), (I-10) + (1.31), (I-10) + (1.32), (I-10) + (1.33), (I-10) + (1.34), (I-10) + (1.35), (I-10) + (1.36), (I-10) + (1.37), (I-10) + (1.38), (I-10) + (1.39), (I-10) + (1.40), (I-10) + (1.41), (I-10) + (1.42), (I-10) + (1.43), (I-10) + (1.44), (I-10) + (1.45), (I-10) + (1.46), (I-10) + (1.47), (I-10) + (1.48), (I-10) + (1.49), (I-10) + (1.50), (I-10) + (1.51), (I-10) + (1.52), (I-10) + (1.53), (I-10) + (1.54), (I-10) + (1.55), (I-10) + (1.56), (I-10) + (1.57), (I-10) + (1.58), (I-10) + (1.59), (I-

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10) + (1.60), (I-10) + (1.61), (I-10) + (1.62), (I-10) + (1.63), (I-10) + (1.64), (I-10) + (2.1), (I-10) + (2.2), (I-10) + (2.3), (I-10) + (2.4), (I-10) + (2.5), (I-10) + (2.6), (I-10) + (2.7), (I-10) + (2.8), (I-10) + (2.9), (I-10) + (2.10), (I-10) + (2.11), (I-10) + (2.12), (I-10) + (2.13), (I-10) + (2.14), (I-10) + (2.15), (I-10) + (2.16), (I-10) + (2.17), (I-10) + (2.18), (I-10) + (2.19), (I-10) + (2.20), (I-10) + (2.21), (I-10) + (2.22), (I-10) + (2.23), (I-10) + (2.24), (I-10) + (2.25), (I-10) + (2.26), (I-10) + (2.27), (I-10) + (2.28), (I-10) + (2.29), (I-10) + (3.1), (I-10) + (3.2), (I-10) + (3.3), (I-10) + (3.4), (I-10) + (3.5), (I-10) + (3.6), (I-10) + (3.7), (I-10) + (3.8), (I-10) + (3.9), (I-10) + (3.10), (I-10) + (3.11), (I-10) + (3.12), (I-10) + (3.13), (I-10) + (3.14), (I-10) + (3.15), (I-10) + (3.16), (I-10) + (3.17), (I-10) + (3.18), (I-10) + (3.19), (I-10) + (3.20), (I-10) + (3.21), (I-10) + (3.22), (I-10) + (3.23), (I-10) + (3.24), (I-10) + (3.25), (I-10) + (3.26), (I-10) + (3.27), (I-10) + (3.28), (I-10) + (3.29), (I-10) + (3.30), (I-10) + (3.31), (I-10) + (3.32), (I-10) + (3.33), (I-10) + (4.1), (I-10) + (4.2), (I-10) + (4.3), (I-10) + (4.4), (I-10) + (4.5), (I-10) + (4.6), (I-10) + (4.7), (I-10) + (4.8), (I-10) + (4.9), (I-10) + (4.10), (I-10) + (4.11), (I-10) + (4.12), (I-10) + (4.13), (I-10) + (4.14), (I-10) + (5.1), (I-10) + (5.2), (I-10) + (5.3), (I-10) + (5.4), (I-10) + (5.5), (I-10) + (5.6), (I-10) + (5.7), (I-10) + (5.8), (I-10) + (5.9), (I-10) + (5.10), (I-10) + (5.11), (I-10) + (5.12), (I-10) + (5.13), (I-10) + (5.14), (I-10) + (5.15), (I-10) + (5.16), (I-10) + (5.17), (I-10) + (5.18), (I-10) + (5.19), (I-10) + (5.20), (I-10) + (5.21), (I-10) + (5.22), (I-10) + (5.23), (I-10) + (5.24), (I-10) + (5.25), (I-10) + (5.26), (I-10) + (5.27), (I-10) + (5.28), (I-10) + (5.29), (I-10) + (5.30), (I-10) + (5.31), (I-10) + (5.32), (I-10) + (5.33), (I-10) + (5.34), (I-10) + (6.1), (I-10) + (6.2), (I-10) + (6.3), (I-10) + (6.4), (I-10) + (7.1), (I-10) + (7.2), (I-10) + (7.3), (I-10) + (7.4), (I-10) + (7.5), (I-10) + (7.6), (I-10) + (7.7), (I-10) + (7.8), (I-10) + (8.1), (I-10) + (8.2), (I-10) + (8.3), (I-10) + (8.4), (I-10) + (9.1), (I-10) + (9.2), (I-10) + (9.3), (I-10) + (9.4), (I-10) + (9.5), (I-10) + (9.6), (I-10) + (9.7), (I-10) + (9.8), (I-10) + (9.9), (I-10) + (10.1), (I-10) + (10.2), (I-10) + (10.3), (I-10) + (10.4), (I-10) + (10.5), (I-10) + (10.6), (I-10) + (10.7), (I-10) + (10.8), (I-10) + (10.9), (I-10) + (10.10), (I-10) + (10.11), (I-10) + (10.12), (I-10) + (10.13), (I-10) + (10.14), (I-10) + (10.15), (I-10) + (11.1), (I-10) + (11.2), (I-10) + (11.3), (I-10) + (11.4), (I-10) + (11.5), (I-10) + (11.6), (I-10) + (11.7), (I-10) + (12.1), (I-10) + (12.2), (I-10) + (12.3), (I-10) + (12.4), (I-10) + (12.5), (I-10) + (12.6), (I-10) + (12.7), (I-10) + (12.8), (I-10) + (12.9), (I-10) + (12.10), (I-10) + (12.11), (I-10) + (12.12), (I-10) + (12.13), (I-10) + (13.1), (I-10) + (13.2), (I-10) + (13.3), (I-10) + (13.4), (I-10) + (13.5), (I-10) + (13.6), (I-10) + (13.7), (I-10) + (14.1), (I-10) + (14.2), (I-10) + (14.3), (I-10) + (14.4), (I-10) + (14.5), (I-10) + (15.1), (I-10) + (15.2), (I-10) + (15.3), (I-10) + (15.4), (I-10) + (15.5), (I-10) + (15.6), (I-10) + (15.7), (I-10) + (15.8), (I-10) + (15.9), (I-10) + (15.10), (I-10) + (15.11), (I-10) + (15.12), (I-10) + (15.13), (I-10) + (15.14), (I-10) + (15.15), (I-10) + (15.16), (I-10) + (15.17), (I-10) + (15.18), (I-10) + (15.19), (I-10) + (15.20), (I-10) + (15.21), (I-10) + (15.22), (I-10) + (15.23), (I-10) + (15.24), (I-10) + (15.25), (I-10) + (15.26), (I-10) + (15.27), (I-10) + (15.28), (I-10) + (15.29), (I-10) + (15.30), (I-10) + (15.31), (I-10) + (15.32), (I-10) + (15.33), (I-10) + (15.34), (I-10) + (15.35), (I-10) + (15.36), (I-10) + (15.37), (I-10) + (15.38), (I-

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10) + (15.39), (I-10) + (15.41), (I-10) + (15.42), (I-10) + (15.43), (I-10) + (15.44), (I-10) + (15.45), (I-10) + (15.46), (I-10) + (15.47), (I-10) + (15.48), (I-10) + (15.49), (I-10) + (15.50), (I-10) + (15.51), (I-10) + (15.52), (I-10) + (15.53), (I-10) + (15.54), (I-10) + (15.55), (I-10) + (15.56), (I-10) + (15.57), (I-10) + (15.58), (I-10) + (15.59), (I-10) + (15.60), (I-10) + (15.61), (I-10) + (15.62), (I-10) + (15.63), (I-10) + (15.64), (I-10) + (15.65), (I-10) + (15.66), (I-10) + (15.67), (I-10) + (15.68), (I-10) + (15.69), (I-10) + (15.70), (I-10) + (15.71), (I-10) + (15.72), (I-10) + (15.73), (I-10) + (15.74), (I-10) + (15.75), (I-10) + (15.76), (I-10) + (15.77), (I-10) + (15.78), (I-10) + (15.79), (I-10) + (15.80), (I-10) + (15.81), (I-10) + (15.82), (I-10) + (15.83), (I-10) + (15.84), (I-10) + (15.85), (I-10) + (15.86), (I-10) + (15.87), (I-10) + (15.88), (I-10) + (15.89), (I-10) + (15.90), (I-10) + (15.91), (I-10) + (15.92), (I-10) + (15.93), (I-10) + (15.94).

In a further particularly preferred embodiment this invention is directed to mixtures comprising the compound (I-10) as compound of formula (I) and one component (B), in particular the mixtures (I-10) + (2.1), (I-10) + (2.2), (I-10) + (2.6), (I-10) + (2.8), (I-10) + (2.11), (I-10) + (2.12), (I-10) + (2.13), (I-10) + (2.14), (I-10) + (2.15), (I-10) + (2.16), (I-10) + (2.17), (I-10) + (2.29), (I-10) + (3.1), (I-10) + (3.2), (I-10) + (3.3), (I-10) + (3.4), (I-10) + (3.9), (I-10) + (3.10), (I-10) + (3.12), (I-10) + (3.16), (I-10) + (3.17), (I-10) + (3.22), (I-10) + (4.6), (I-10) + (5.1), (I-10) + (5.4), (I-10) + (5.5), (I-10) + (5.7), (I-10) + (5.8), (I-10) + (5.9), (I-10) + (5.16), (I-10) + (5.23), (I-10) + (5.25), (I-10) + (5.26), (I-10) + (5.29), (I-10) + (5.30), (I-10) + (7.7), (I-10) + (9.2), (I-10) + (9.4), (I-10) + (9.5), (I-10) + (10.9), (I-10) + (10.10), (I-10) + (12.9), (I-10) + (12.10), (I-10) + (14.4), (I-10) + (15.9), (I-10) + (15.24), (I-10) + (15.25), (I-10) + (15.26), (I-10) + (15.41), (I-10) + (15.42), (I-10) + (15.54), (I-10) + (15.55), (I-10) + (15.56), (I-10) + (15.60), (I-10) + (15.90).

If the active compounds in the active compound combinations according to the invention are present in certain weight ratios, the synergistic effect is particularly pronounced. However, the weight ratios of the active compounds in the active compound combinations can be varied within a relatively wide range.

In the combinations according to the invention the compounds (A) and (B) are present in a synergistically effective weight ratio of A:B in a range of 100:1 to 1:100, preferably in a weight ratio of 50:1 to 1:50, most preferably in a weight ratio of 20:1 to 1:20. Further ratios of A:B which can be used according to the present invention with increasing preference in the order given are: 95:1 to 1:95, 90:1 to 1:90, 85:1 to 1:85, 80:1 to 1:80, 75:1 to 1:75, 70:1 to 1:70, 65:1 to 1:65, 60:1 to 1:60, 55:1 to 1:55, 45:1 to 1:45, 40:1 to 1:40, 35:1 to 1:35, 30:1 to 1:30, 25:1 to 1:25, 15:1 to 1:15, 10:1 to 1:10, 5:1 to 1:5, 4:1 to 1:4, 3:1 to 1:3, 2:1 to 1:2.

Where a compound (A) or a compound (B) can be present as mixtures of various possible isomeric forms, in particular of stereoisomers, such as, for example, E and Z, threo and erythro, and also optical isomers, and, if

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appropriate, also of tautomers. What is claimed are both the E and the Z isomers and the threo and erythro and also the optical isomers (R and S), any mixtures of these isomers, and also the possible tautomeric forms.

Compounds (A) or compounds (B) having at least one basic centre are capable of forming, for example, acid addition salts, e.g. with strong inorganic acids, such as mineral acids, e.g. perchloric acid, sulfuric acid, nitric acid, nitrous acid, a phosphoric acid or a hydrohalic acid, with strong organic carboxylic acids, such as unsubstituted substituted, e.g. halo-substituted, C_1-C_4 alkanecarboxylic acids, e.g. acetic acid, saturated or unsaturated dicarboxylic acids, e.g. oxalic, malonic, succinic, maleic, fumaric and phthalic acid, hydroxy-carboxylic acids, e.g. ascorbic, lactic, malic, tartaric and citric acid, or benzoic acid, or with organic sulfonic acids, such as unsubstituted or substituted, e.g. halo-substituted, C_1-C_4alkane- or aryl-sulfonic acids, e.g. methane- or p-toluene-sulfonic acid. Compounds (A) or compounds (B) having at least one acid group are capable of forming, for example, salts with bases, e.g. metal salts, such as alkali metal or alkaline earth metal salts, e.g. sodium, potassium or magnesium salts, or salts with ammonia or an organic amine, such as morpholine, piperidine, pyrrolidine, a mono-, di- or tri-lower alkylamine, e.g. ethyl-, diethyl-, triethyl- or dimethyl-propyl-amine, or a mono-, di- or tri-hydroxy-lower alkylamine, e.g. mono-, di- or tri-ethanolamine. In addition, corresponding internal salts may optionally be formed. In the context of the invention, preference is given to agrochemically advantageous salts. In view of the close relationship between the compounds (A) or the compounds (B) in free form and in the form of their salts, hereinabove and herein below any reference to the free compounds (A) or free compounds (B) or to their salts should be understood as including also the corresponding salts or the free compounds (A) or free compounds (B), respectively, where appropriate and expedient. The equivalent also applies to tautomers of compounds (A) or compounds (B) and to their salts.

According to the invention the expression "combination" stands for the various combinations of compounds (A) and (B), for example in a single "ready-mix" form, in a combined spray mixture composed from separate formulations of the single active compounds, such as a "tank-mix", and in a combined use of the single active ingredients when applied in a sequential manner, i.e. one after the other with a reasonably short period, such as a few hours or days. Preferably the order of applying the compounds (A) and (B) is not essential for working the present invention.

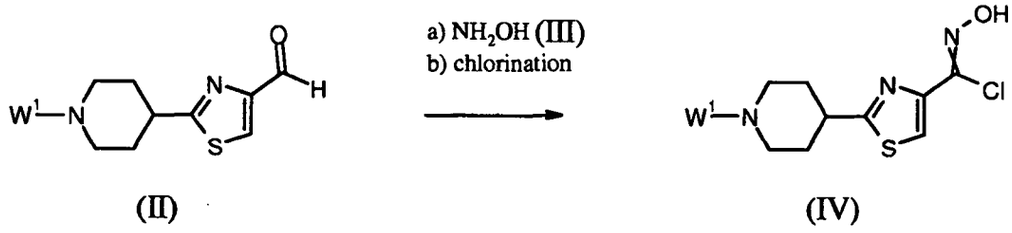
Illustration of the processes and intermediates

The bis(difluoromethyl)pyrazole derivatives of the formula (I) can be prepared in different ways. First of all, the possible processes are shown schematically hereinafter. Unless stated otherwise, the radicals stated are each as defined above.

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Process A

Scheme 1: Process A



(II) (IV)

W^1 is acetyl, C_1-C_4-alkoxycarbonyl, benzyl, benzyloxycarbonyl or [3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]acetyl

One means of preparing the intermediate **(IV)** from compound **(II)** is shown in Scheme 1 (Process A).

A compound of the general formula **(IV)** is obtained by condensation of an aldehyde of the formula **(II)** with hydroxylamine **(III)** and subsequent chlorination (see, for example, WO 05/0040159, WO 08/013622 and *Synthesis* **1987**, 11, 998-1001).

In process A, aldehyde **(II)** and hydroxylamine **(VII)** are first reacted (Scheme 1, step (a)). The corresponding oxime is subsequently chlorinated in the presence of a suitable chlorinating agent. Preferred chlorinating reagents are N-chlorosuccinimide, HClO and chlorine. After step (a) of process A, the reaction mixture can be worked up by customary methods or converted further directly in step (b).

The aldehyds **(II)** are commercially available (for W^1 = t-butoxycarbonyl: Maybridge) or can be prepared from commercially available precursors by methods described in the literature. For example, the aldehyds **(II)** can be prepared starting from the corresponding methyl- or ethylester by reduction with lithium aluminium hydrid in tetrahydrofurane at 0°C followed by an oxidation of the produced alkohols with Dess-Martin periodinane reagent at room temperature in dichloromethane (see e.g. WO 07/147336 und WO 07/039177 for the reduction with lithium aluminium hydrid and *J. Am. Chem. Soc.* **1978**, 100, 300-301; **1979**, 101, 5294-5299; **1991**, 113, 7277-7287 for the oxidation with Dess-Martin periodinane reagent).

Process A is preferably performed using one or more diluents. In step (a) of process A according to the invention, preference is given to using protic solvents, for example ethanol, as the solvent. After the formation of the corresponding oxime from compound **(II)**, the reaction mixture is diluted in step (b) with a further solvent, for example tetrahydrofuran, and then admixed with aqueous sodium hypochlorite. The chlorination can likewise be effected with the aid of N-chlorosuccinimide in DMF.

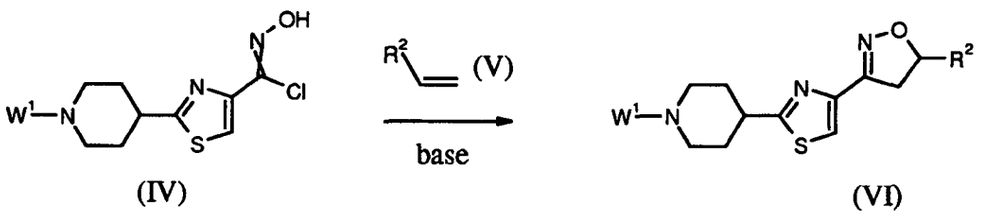
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In the performance of process A, the reaction temperatures can be varied within a relatively wide range. In general, the temperatures employed are from -10°C to +150°C, preferably temperatures from 0°C to +100°C, most preferably reflux temperature of the solvent in step (a), and 0°C to 30°C in step (b).

To perform process A, generally 1 to 2 mol, preferably 1 mol, of hydroxylamine (III) and generally 1 to 5 mol, preferably 1 mol, of a chlorinating reagent are used per mole of compound of the formula (II). The reaction time is 1 to 48 hours. The workup is effected by customary methods. If necessary, the compounds are purified by recrystallization, distillation or chromatography, or can optionally also be used in the next step without prior purification.

Process B

Scheme 2: Process B



(IV) (VI)

W^1 is acetyl, C_1-C_4-alkoxycarbonyl, benzyl, benzyloxycarbonyl or [3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]acetyl

R2 represents phenyl, which is at least substituted with one prop-2-yn-1-yloxy or one hydroxy group and optionally be additionally substituted by one, two or three substituents selected from the group consisting of methyl, methoxy, fluoro or chloro

One means of preparing the intermediate (VI) from compound (IV) is shown in Scheme 2 (Process B).

A compound of the general formula (VI) is obtained from an alkene of the general formula (IV) and compound (V) by a cycloaddition reaction (see, for example, WO08/013622, and *Synthesis*, **1987**, 11, 998-1001).

The alkenes (V) are commercially available or can be prepared from commercially available precursors by methods described in the literature (for example from ketones or aldehydes by a Wittig or Horner-Wadsworth-Emmons olefination: *Chem. Rev.* **1989**, 89, 863-927 and Julia olefination: *Tetrahedron Lett.*, **1973**, 14, 4833-4836; Peterson olefination: *J. Org. Chem.* **1968**, *33*, 780).

Process B is performed in the presence of a suitable base. Preferred bases are tertiary amines (e.g. triethylamine), and alkali metal or alkaline earth metal carbonates, hydrogencarbonates and phosphates.

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Process B is preferably performed using one or more diluents. In the performance of process B, inert organic solvents are a preferred option (for example toluene and hexane). Water is likewise a possible solvent. Alternatively, process B can be performed in an excess of the alkene (**V**).

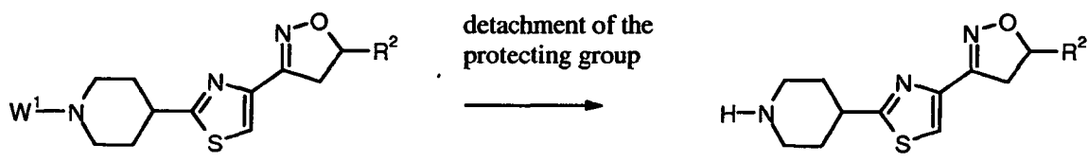
Typically, a suitable base and the olefin (**V**) are initially charged and compound (**IV**) is added. Alternatively, compounds (**IV**) and (**V**) are initially charged and a suitable base is added.

In the performance of process B, the reaction temperatures can be varied within a relatively wide range. In general, the temperatures employed are from -120°C to +150°C, preferably temperatures of -10°C to +100°C, most preferably 0°C to 30°C.

To perform process B, generally 0.5 to 5 mol, preferably 1 mol, of the alkene (**V**) are used per mole of compound of the formula (**IV**). The reaction time is 1 to 48 hours. The workup is effected by customary methods. If necessary, the compounds are purified by recrystallization, distillation or chromatography, or can optionally also be used in the next step without prior purification.

Process C

Scheme 3: Process C



(VI) (VII)

W^1 is acetyl, C_1-C_4-alkoxycarbonyl, benzyl or benzyloxycarbonyl

R2 represents phenyl, which is at least substituted with one prop-2-yn-1-yloxy or one hydroxy group and optionally be additionally substituted by one, two or three substituents selected from the group consisting of methyl, methoxy, fluoro or chloro

One means of preparing compounds of the formula (**VII**) from corresponding compounds (**VI**) is shown in Scheme 3.

A compound of the formula (**VI**) is converted to a compound of the formula (**VII**) by suitable methods for removing protecting groups, which are described in the literature ("*Protective Groups in Organic Synthesis*"; Third Edition; 1999; 494-653, and literature cited therein).

tert-Butoxycarbonyl and benzyloxycarbonyl protecting groups can be removed in an acidic medium (for example with hydrochloric acid or trifluoroacetic acid). Acetyl protecting groups can be removed under basic

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conditions (for example with potassium carbonate or caesium carbonate). Benzylic protecting groups can be removed by hydrogenolysis with hydrogen in the presence of a catalyst (for example palladium on activated carbon).

Useful solvents are all customary solvents which are inert under the reaction conditions, for example alcohols (e.g. methanol, ethanol, propanol), cyclic and acyclic ethers (e.g. diethyl ether, tetrahydrofuran, dioxane), aromatic hydrocarbons (e.g. benzene, toluene, xylene), halogenated hydrocarbons (e.g. dichloromethane, chloroform, carbon tetrachloride), halogenated aromatic hydrocarbons (e.g. chlorobenzene, dichlorobenzene), nitriles (e.g. acetonitrile), carboxylic esters (e.g. ethyl acetate), amides (e.g. N,N-dimethylformamide, N,N-dimethylacetamide), dimethyl sulphoxide, 1,3-dimethyl-2-imidazolinone, water and acetic acid, or the reaction can be performed in mixtures of two or more of these solvents.

Acids which can be used for this reaction of deprotection of t-butoxycarbonyl and benzyloxycarbonyl groups are, for example, trifluoroacetic acid, hydrochloric acid or other acids as described in the literature (for example "*Protective Groups in Organic Synthesis*"; Third Edition; 1999; pp. 494-653).

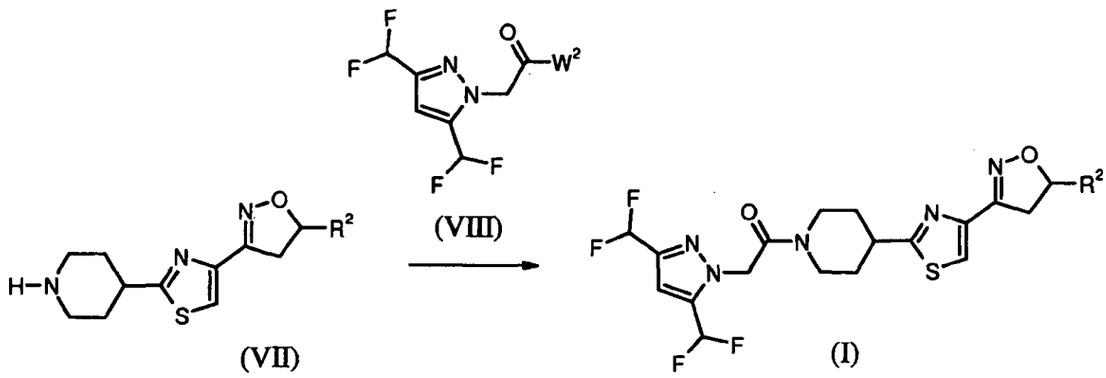
The reaction is normally performed at temperatures of 0°C to +150°C and preferably at room temperature, but it can also be performed at reflux temperature of the reaction mixture. The reaction time varies as a function of the scale of the reaction and the reaction temperature, but is generally between half an hour and 72 hours.

After the reaction has ended, the compounds (VII) are separated from the reaction mixture by one of the customary separation techniques. If necessary, the compounds are purified by recrystallization, distillation or chromatography, or can, if desired, also be used in the next step without prior purification. It is also possible to isolate the compound of the general formula (VII) as a salt, for example as a salt of hydrochloric acid or of trifluoroacetic acid.

Process D

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Scheme 4: Process D



W^2 is chlorine or OH

R2 represents phenyl, which is at least substituted with one prop-2-yn-1-yloxy or one hydroxy group and optionally be additionally substituted by one, two or three substituents selected from the group consisting of methyl, methoxy, fluoro or chloro

One means of preparing compounds of the formula (I) from corresponding compounds (VII) is shown in Scheme 4.

A compound with the general formula (I) can be synthesized analogously to methods described in the literature (see, for example WO 07/147336), by a coupling reaction of a compound with the corresponding general formula (VII) with a substrate of the general formula (VIIIa) where W^{2a} = chlorine, optionally in the presence of an acid scavenger/base.

Compounds (VIIIa) (W^{2a} = chlorine) or (VIIIb) (W^{2b} = OH) are either commercially available or can be prepared by processes described in the literature (see, for example, WO 08/013622 and WO 08/013925). In addition, a substrate with the general formula (VIIIa) where W^{2a} = chlorine can be prepared from the corresponding acid (W^{2b} = OH) by chlorination using processes known from the literature (e.g. *Tetrahedron* **2005**, 61, 10827-10852, and literature cited therein).

The solvents used may be all customary solvents which are inert under the reaction conditions, for example cyclic and acyclic ethers (e.g. diethyl ether, tetrahydrofuran, dioxane), aromatic hydrocarbons (e.g. benzene, toluene, xylene), halogenated hydrocarbons (e.g. dichloromethane, chloroform, carbon tetrachloride), halogenated aromatic hydrocarbons (e.g. chlorobenzene, dichlorobenzene) and nitriles (e.g. acetonitrile), or the reaction can be performed in mixtures of two or more of these solvents. The preferred solvents are tetrahydrofuran and dichloromethane.

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At least one equivalent of an acid scavenger/a base (for example Hünig's base, triethylamine or commercially available polymeric acid scavengers) is used, in relation to the starting material of the general formula (VII). If the starting material is a salt, at least two equivalents of the acid scavenger are required.

The reaction is normally performed at temperatures of 0°C to 100°C and preferably at 20°C to 30°C, but it can also be performed at reflux temperature of the reaction mixture. The reaction time varies as a function of the scale of the reaction and the reaction temperature, but is generally between a few minutes and 48 hours.

After the reaction has ended, the compounds (I) are separated from the reaction mixture by one of the customary separation techniques. If necessary, the compounds are purified by recrystallization, distillation or chromatography, or can optionally also be used in the next step without prior purification.

Alternatively, a compound of the formula (I) can also be synthesized from the corresponding compound of the formula (VII) with a substrate of the formula (VIIIb) where W^{2b} = OH in the presence of a coupling reagent, analogously to methods described in the literature (e.g. *Tetrahedron* **2005**, 61, 10827-10852, and references cited therein).

Suitable coupling reagents are, for example, peptide coupling reagents (for example N-(3-dimethylaminopropyl)-N'-ethylcarbodiimide mixed with 4-dimethylaminopyridine, N-(3-dimethylaminopropyl)-N'-ethylcarbodiimide mixed with 1-hydroxybenzotriazole, bromotripyrrolidinophosphonium hexafluorophosphate, O-(7-azabenzotriazol-1-yl)-N,N,N',N'-tetramethyluronium hexafluorophosphate, etc.).

If appropriate, a base, for example triethylamine or Hünig's base, can be used in the reaction.

The hydroxy substituents in R^2 can be modified by reaction methods which are common knowledge to those skilled in the art at all stages of the synthesis in which they occur. For example, OH functionalities can be alkylated by known methods with suitable halides or sulphates (see, for example, J. March: Advanced Organic Chemistry – Reactions, Mechanisms, and Structures, 4th Ed. (1992), Wiley, New York, pages 388-390, 406-407, 411-415). Examples of such reactions can be found in the synthesis part of this application.

The solvents used may be all customary solvents which are inert under the reaction conditions, for example alcohols (e.g. methanol, ethanol, propanol), cyclic and acyclic ethers (e.g. diethyl ether, tetrahydrofuran, dioxane), aromatic hydrocarbons (e.g. benzene, toluene, xylene), halogenated hydrocarbons (e.g. di-

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chloromethane, chloroform, carbon tetrachloride), halogenated aromatic hydrocarbons (e.g. chlorobenzene, dichlorobenzene), nitriles (e.g. acetonitrile) and amides (e.g. N,N-dimethylformamide, N,N-dimethylacetamide), or the reaction can be performed in mixtures of two or more of these solvents. The preferred solvent is dichloromethane.

The reaction is normally performed at temperatures of 0°C – 100°C and preferably at 0°C – 30°C, but it can also be carried out at reflux temperature of the reaction mixture. The reaction time varies as a function of the scale of the reaction and the reaction temperature, but is generally between a few minutes and 48 hours.

After the reaction has ended, the compounds (**I**) are separated from the reaction mixture by one of the customary separation techniques. If necessary, the compounds are purified by recrystallization, distillation or chromatography, or can optionally also be used in the next step without prior purification.

The present invention furthermore relates to compositions for combating/controlling undesirable microorganisms comprising the active compound combinations according to the invention. Preferably, the compositions are fungicidal compositions comprising agriculturally suitable auxiliaries, solvents, carriers, surfactants or extenders.

Furthermore the invention relates to a method of combating undesirable microorganisms, characterized in that the active compound combinations according to the invention are applied to the phytopathogenic fungi and/or their habitat.

According to the invention, carrier is to be understood as meaning a natural or synthetic, organic or inorganic substance which is mixed or combined with the active compounds for better applicability, in particular for application to plants or plant parts or seeds. The carrier, which may be solid or liquid, is generally inert and should be suitable for use in agriculture.

Suitable solid or liquid carriers are: for example ammonium salts and natural ground minerals, such as kaolins, clays, talc, chalk, quartz, attapulgite, montmorillonite or diatomaceous earth, and ground synthetic minerals, such as finely divided silica, alumina and natural or synthetic silicates, resins, waxes, solid fertilizers, water, alcohols, especially butanol, organic solvents, mineral oils and vegetable oils, and also derivatives thereof. It is also possible to use mixtures of such carriers. Solid carriers suitable for granules are: for example crushed and fractionated natural minerals, such as calcite, marble, pumice, sepiolite, dolomite, and also

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synthetic granules of inorganic and organic meals and also granules of organic material, such as sawdust, coconut shells, maize cobs and tobacco stalks.

Suitable liquefied gaseous extenders or carriers are liquids which are gaseous at ambient temperature and under atmospheric pressure, for example aerosol propellants, such as butane, propane, nitrogen and carbon dioxide.

Tackifiers, such as carboxymethylcellulose and natural and synthetic polymers in the form of powders, granules and latices, such as gum arabic, polyvinyl alcohol, polyvinyl acetate, or else natural phospholipids, such as cephalins and lecithins and synthetic phospholipids can be used in the formulations. Other possible additives are mineral and vegetable oils and waxes, optionally modified.

If the extender used is water, it is also possible for example, to use organic solvents as auxiliary solvents. Suitable liquid solvents are essentially: aromatic compounds, such as xylene, toluene or alkylnaphthalenes, chlorinated aromatic compounds or chlorinated aliphatic hydrocarbons, such as chlorobenzenes, chloroethylenes or methylene chloride, aliphatic hydrocarbons, such as cyclohexane or paraffins, for example mineral oil fractions, mineral and vegetable oils, alcohols, such as butanol or glycol, and also ethers and esters thereof, ketones, such as acetone, methyl ethyl ketone, methyl isobutyl ketone or cyclohexanone, strongly polar solvents, such as dimethylformamide and dimethyl sulphoxide, and also water.

The compositions according to the invention may comprise additional further components, such as, for example, surfactants. Suitable surfactants are emulsifiers, dispersants or wetting agents having ionic or nonionic properties, or mixtures of these surfactants. Examples of these are salts of polyacrylic acid, salts of lignosulphonic acid, salts of phenolsulphonic acid or naphthalenesulphonic acid, polycondensates of ethylene oxide with fatty alcohols or with fatty acids or with fatty amines, substituted phenols (preferably alkylphenols or arylphenols), salts of sulphosuccinic esters, taurine derivatives (preferably alkyl taurates), phosphoric esters of polyethoxylated alcohols or phenols, fatty esters of polyols, and derivatives of the compounds containing sulphates, sulphonates and phosphates. The presence of a surfactant is required if one of the active compounds and/or one of the inert carriers is insoluble in water and when the application takes place in water. The proportion of surfactants is between 5 and 40 per cent by weight of the composition according to the invention.

It is possible to use colorants such as inorganic pigments, for example iron oxide, titanium oxide, Prussian blue, and organic dyes, such as alizarin dyes, azo dyes and metal phthalocyanine dyes, and trace nutrients, such as salts of iron, manganese, boron, copper, cobalt, molybdenum and zinc.

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If appropriate, other additional components may also be present, for example protective colloids, binders, adhesives, thickeners, thixotropic substances, penetrants, stabilizers, sequestering agents, complex formers. In general, the active compounds can be combined with any solid or liquid additive customarily used for formulation purposes.

In general, the compositions according to the invention comprise between 0.05 and 99 per cent by weight, 0.01 and 98 per cent by weight, preferable between 0.1 and 95 per cent by weight, particularly preferred between 0.5 and 90 per cent by weight of the active compound combination according to the invention, very particularly preferable between 10 and 70 per cent by weight.

The active compound combinations or compositions according to the invention can be used as such or, depending on their respective physical and/or chemical properties, in the form of their formulations or the use forms prepared therefrom, such as aerosols, capsule suspensions, cold-fogging concentrates, warm-fogging concentrates, encapsulated granules, fine granules, flowable concentrates for the treatment of seed, ready-to-use solutions, dustable powders, emulsifiable concentrates, oil-in-water emulsions, water-in-oil emulsions, macrogranules, microgranules, oil-dispersible powders, oil-miscible flowable concentrates, oil-miscible liquids, foams, pastes, pesticide-coated seed, suspension concentrates, suspoemulsion concentrates, soluble concentrates, suspensions, wettable powders, soluble powders, dusts and granules, water-soluble granules or tablets, water-soluble powders for the treatment of seed, wettable powders, natural products and synthetic substances impregnated with active compound, and also microencapsulations in polymeric substances and in coating materials for seed, and also ULV cold-fogging and warm-fogging formulations.

The formulations mentioned can be prepared in a manner known per se, for example by mixing the active compounds or the active compound combinations with at least one additive. Suitable additives are all customary formulation auxiliaries, such as, for example, organic solvents, extenders, solvents or diluents, solid carriers and fillers, surfactants (such as adjuvants, emulsifiers, dispersants, protective colloids, wetting agents and tackifiers), dispersants and/or binders or fixatives, preservatives, dyes and pigments, defoamers, inorganic and organic thickeners, water repellents, if appropriate siccatives and UV stabilizers, gibberellins and also water and further processing auxiliaries. Depending on the formulation type to be prepared in each case, further processing steps such as, for example, wet grinding, dry grinding or granulation may be required.

The compositions according to the invention do not only comprise ready-to-use compositions which can be applied with suitable apparatus to the plant or the seed, but also commercial concentrates which have to be diluted with water prior to use.

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The active compound combinations according to the invention can be present in (commercial) formulations and in the use forms prepared from these formulations as a mixture with other (known) active compounds, such as insecticides, attractants, sterilants, bactericides, acaricides, nematicides, fungicides, growth regulators, herbicides, fertilizers, safeners and Semiochemicals.

The treatment according to the invention of the plants and plant parts with the active compounds or compositions is carried out directly or by action on their surroundings, habitat or storage space using customary treatment methods, for example by dipping, spraying, atomizing, irrigating, evaporating, dusting, fogging, broadcasting, foaming, painting, spreading-on, watering (drenching), drip irrigating and, in the case of propagation material, in particular in the case of seeds, furthermore as a powder for dry seed treatment, a solution for seed treatment, a water-soluble powder for slurry treatment, by incrusting, by coating with one or more layers, etc. It is furthermore possible to apply the active compounds by the ultra-low volume method, or to inject the active compound preparation or the active compound itself into the soil.

The invention furthermore comprises a method for treating seed. The invention furthermore relates to seed treated according to one of the methods described in the preceding paragraph.

The active compounds or compositions according to the invention are especially suitable for treating seed. A large part of the damage to crop plants caused by harmful organisms is triggered by an infection of the seed during storage or after sowing as well as during and after germination of the plant. This phase is particularly critical since the roots and shoots of the growing plant are particularly sensitive, and even small damage may result in the death of the plant. Accordingly, there is great interest in protecting the seed and the germinating plant by using appropriate compositions.

The control of phytopathogenic fungi by treating the seed of plants has been known for a long time and is the subject of continuous improvements. However, the treatment of seed entails a series of problems which cannot always be solved in a satisfactory manner. Thus, it is desirable to develop methods for protecting the seed and the germinating plant which dispense with the additional application of crop protection agents after sowing or after the emergence of the plants or which at least considerably reduce additional application. It is furthermore desirable to optimize the amount of active compound employed in such a way as to provide maximum protection for the seed and the germinating plant from attack by phytopathogenic fungi, but without damaging the plant itself by the active compound employed. In particular, methods for the treatment of seed should also take into consideration the intrinsic fungicidal properties of transgenic plants in order to achieve optimum protection of the seed and the germinating plant with a minimum of crop protection agents being employed.

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Accordingly, the present invention also relates in particular to a method for protecting seed and germinating plants against attack by phytopathogenic fungi by treating the seed with a composition according to the invention. The invention also relates to the use of the compositions according to the invention for treating seed for protecting the seed and the germinating plant against phytopathogenic fungi. Furthermore, the invention relates to seed treated with a composition according to the invention for protection against phytopathogenic fungi.

The control of phytopathogenic fungi which damage plants post-emergence is carried out primarily by treating the soil and the above-ground parts of plants with crop protection compositions. Owing to the concerns regarding a possible impact of the crop protection composition on the environment and the health of humans and animals, there are efforts to reduce the amount of active compounds applied.

One of the advantages of the present invention is that, because of the particular systemic properties of the compositions according to the invention, treatment of the seed with these compositions not only protects the seed itself, but also the resulting plants after emergence, from phytopathogenic fungi. In this manner, the immediate treatment of the crop at the time of sowing or shortly thereafter can be dispensed with.

It is also considered to be advantageous that the mixtures according to the invention can be used in particular also for transgenic seed where the plant growing from this seed is capable of expressing a protein which acts against pests. By treating such seed with the active compound combinations or compositions according to the invention, even by the expression of the, for example, insecticidal protein, certain pests may be controlled. Surprisingly, a further synergistic effect may be observed here, which additionally increases the effectiveness of the protection against attack by pests.

The compositions according to the invention are suitable for protecting seed of any plant variety employed in agriculture, in the greenhouse, in forests or in horticulture or viticulture. In particular, this takes the form of seed of cereals (such as wheat, barley, rye, triticale, millet, oats), maize (corn), cotton, soya bean, rice, potatoes, sunflowers, beans, coffee, beets (e.g. sugar beets and fodder beets), peanuts, oilseed rape, poppies, olives, coconuts, cacao, sugar cane, tobacco, vegetables (such as tomatoes, cucumbers, onions and lettuce), lawn and ornamental plants (also see below). The treatment of seeds of cereals (such as wheat, barley, rye, triticale, and oats), maize (corn) and rice is of particular importance.

As also described further below, the treatment of transgenic seed with the active compound combinations or compositions according to the invention is of particular importance. This refers to the seed of plants containing at least one heterologous gene which allows the expression of a polypeptide or protein having insecti-

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cidal properties. The heterologous gene in transgenic seed can originate, for example, from microorganisms of the species Bacillus, Rhizobium, Pseudomonas, Serratia, Trichoderma, Clavibacter, Glomus or Gliocladium. Preferably, this heterologous gene is from Bacillus sp., the gene product having activity against the European corn borer and/or the Western corn rootworm. Particularly preferably, the heterologous gene originates from Bacillus thuringiensis.

In the context of the present invention, the active compound combinations or compositions according to the invention are applied on their own or in a suitable formulation to the seed. Preferably, the seed is treated in a state in which it is sufficiently stable so that the treatment does not cause any damage. In general, treatment of the seed may take place at any point in time between harvesting and sowing. Usually, the seed used is separated from the plant and freed from cobs, shells, stalks, coats, hairs or the flesh of the fruits. Thus, it is possible to use, for example, seed which has been harvested, cleaned and dried to a moisture content of less than 15 % by weight. Alternatively, it is also possible to use seed which, after drying, has been treated, for example, with water and then dried again.

When treating the seed, care must generally be taken that the amount of the composition according to the invention applied to the seed and/or the amount of further additives is chosen in such a way that the germination of the seed is not adversely affected, or that the resulting plant is not damaged. This must be borne in mind in particular in the case of active compounds which may have phytotoxic effects at certain application rates.

The compositions according to the invention can be applied directly, that is to say without comprising further components and without having been diluted. In general, it is preferable to apply the compositions to the seed in the form of a suitable formulation. Suitable formulations and methods for the treatment of seed are known to the person skilled in the art and are described, for example, in the following documents: US 4,272,417 A, US 4,245,432 A, US 4,808,430 A, US 5,876,739 A, US 2003/0176428 A1, WO 2002/080675 A1, WO 2002/028186 A2.

The active compound combinations which can be used according to the invention can be converted into customary seed dressing formulations, such as solutions, emulsions, suspensions, powders, foams, slurries or other coating materials for seed, and also ULV formulations.

These formulations are prepared in a known manner by mixing the active compounds or active compound combinations with customary additives, such as, for example, customary extenders and also solvents or diluents, colorants, wetting agents, dispersants, emulsifiers, defoamers, preservatives, secondary thickeners, adhesives, gibberellins and water as well.

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Suitable colorants that may be present in the seed dressing formulations which can be used according to the invention include all colorants customary for such purposes. Use may be made both of pigments, of sparing solubility in water, and of dyes, which are soluble in water. Examples that may be mentioned include the colorants known under the designations Rhodamine B, C.I. Pigment Red 112, and C.I. Solvent Red 1.

Suitable wetting agents that may be present in the seed dressing formulations which can be used according to the invention include all substances which promote wetting and are customary in the formulation of active agrochemical substances. With preference it is possible to use alkylnaphthalene-sulphonates, such as diisopropyl- or diisobutylnaphthalene-sulphonates.

Suitable dispersants and/or emulsifiers that may be present in the seed dressing formulations which can be used according to the invention include all nonionic, anionic, and cationic dispersants which are customary in the formulation of active agrochemical substances. With preference, it is possible to use nonionic or anionic dispersants or mixtures of nonionic or anionic dispersants. Particularly suitable nonionic dispersants are ethylene oxide-propylene oxide block polymers, alkylphenol polyglycol ethers, and tristyrylphenol polyglycol ethers, and their phosphated or sulphated derivatives. Particularly suitable anionic dispersants are lignosulphonates, polyacrylic salts, and arylsulphonate-formaldehyde condensates.

Defoamers that may be present in the seed dressing formulations to be used according to the invention include all foam-inhibiting compounds which are customary in the formulation of agrochemically active compounds. Preference is given to using silicone defoamers, magnesium stearate, silicone emulsions, long-chain alcohols, fatty acids and their salts and also organofluorine compounds and mixtures thereof.

Preservatives that may be present in the seed dressing formulations to be used according to the invention include all compounds which can be used for such purposes in agrochemical compositions. By way of example, mention may be made of dichlorophen and benzyl alcohol hemiformal.

Secondary thickeners that may be present in the seed dressing formulations to be used according to the invention include all compounds which can be used for such purposes in agrochemical compositions. Preference is given to cellulose derivatives, acrylic acid derivatives, polysaccharides, such as xanthan gum or Veegum, modified clays, phyllosilicates, such as attapulgite and bentonite, and also finely divided silicic acids.

Suitable adhesives that may be present in the seed dressing formulations to be used according to the invention include all customary binders which can be used in seed dressings. Polyvinylpyrrolidone, polyvinyl acetate, polyvinyl alcohol and tylose may be mentioned as being preferred.

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Suitable gibberellins that may be present in the seed dressing formulations to be used according to the invention are preferably the gibberellins A1, A3 (= gibberellic acid), A4 and A7; particular preference is given to using gibberellic acid. The gibberellins are known (cf. R. Wegler "Chemie der Pflanzenschutz- and Schädlingsbekämpfungsmittel" [Chemistry of Crop Protection Agents and Pesticides], Vol. 2, Springer Verlag, 1970, pp. 401-412).

The seed dressing formulations which can be used according to the invention may be used directly or after dilution with water beforehand to treat seed of any of a very wide variety of types. The seed dressing formulations which can be used according to the invention or their dilute preparations may also be used to dress seed of transgenic plants. In this context, synergistic effects may also arise in interaction with the substances formed by expression.

Suitable mixing equipment for treating seed with the seed dressing formulations which can be used according to the invention or the preparations prepared from them by adding water includes all mixing equipment which can commonly be used for dressing. The specific procedure adopted when dressing comprises introducing the seed into a mixer, adding the particular desired amount of seed dressing formulation, either as it is or following dilution with water beforehand, and carrying out mixing until the formulation is uniformly distributed on the seed. Optionally, a drying operation follows.

The active compounds or compositions according to the invention have strong microbicidal activity and can be used for controlling unwanted microorganisms, such as fungi and bacteria, in crop protection and material protection.

In crop protection, fungicides can be used for controlling Plasmodiophoromycetes, Oomycetes, Chytridiomycetes, Zygomycetes, Ascomycetes, Basidiomycetes and Deuteromycetes.
In crop protection, bactericides can be used for controlling Pseudomonadaceae, Rhizobiaceae, Enterobacteriaceae, Corynebacteriaceae and Streptomycetaceae.

The fungicidal compositions according to the invention can be used for the curative or protective control of phytopathogenic fungi. Accordingly, the invention also relates to curative and protective methods for controlling phytopathogenic fungi using the active compound combinations or compositions according to the invention, which are applied to the seed, the plant or plant parts, the fruit or the soil in which the plants grow. Preference is given to application onto the plant or the plant parts, the fruits or the soil in which the plants grow.

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The compositions according to the invention for combating phytopathogenic fungi in crop protection comprise an active, but non-phytotoxic amount of the compounds according to the invention. "Active, but non-phytotoxic amount" shall mean an amount of the composition according to the invention which is sufficient to control or to completely kill the plant disease caused by fungi, which amount at the same time does not exhibit noteworthy symptoms of phytotoxicity. These application rates generally may be varied in a broader range, which rate depends on several factors, e.g. the phytopathogenic fungi, the plant or crop, the climatic conditions and the ingredients of the composition according to the invention.

The fact that the active compounds, at the concentrations required for the controlling of plant diseases, are well tolerated by plants permits the treatment of aerial plant parts, of vegetative propagation material and seed, and of the soil.

According to the invention, it is possible to treat all plants and parts of plants. Plants are to be understood here as meaning all plants and plant populations, such as wanted and unwanted wild plants or crop plants (including naturally occurring crop plants). Crop plants can be plants which can be obtained by conventional breeding and optimization methods or by biotechnological and genetic engineering methods or combinations of these methods, including the transgenic plants and including plant cultivars which can or cannot be protected by plant variety protection rights. Parts of plants are to be understood as meaning all above-ground and below-ground parts and organs of the plants, such as shoot, leaf, flower and root, examples which may be mentioned being leaves, needles, stems, trunks, flowers, fruit bodies, fruits and seeds and also roots, tubers and rhizomes. Plant parts also include harvested material and vegetative and generative propagation material, for example seedlings, tubers, rhizomes, cuttings and seeds. Preference is given to the treatment of the plants and the above-ground and below-ground parts and organs of the plants, such as shoot, leaf, flower and root, examples which may be mentioned being leaves, needles, stems, trunks, flowers, and fruits.

The active compounds of the invention, in combination with good plant tolerance and favourable toxicity to warm-blooded animals and being tolerated well by the environment, are suitable for protecting plants and plant organs, for increasing the harvest yields, for improving the quality of the harvested material. They may be preferably employed as crop protection agents. They are active against normally sensitive and resistant species and against all or some stages of development.

The following plants may be mentioned as plants which can be treated according to the invention: cotton, flax, grapevines, fruit, vegetable, such as *Rosaceae sp.* (for example pomaceous fruit, such as apples and pears, but also stone fruit, such as apricots, cherries, almonds and peaches and soft fruit such as strawberries), *Ribesioidae sp.*, *Juglandaceae sp.*, *Betulaceae sp.*, *Anacardiaceae sp.*, *Fagaceae sp.*, *Moraceae sp.*,

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Oleaceae sp., *Actinidaceae sp.*, *Lauraceae sp.*, *Musaceae sp.* (for example banana trees and plantations), *Rubiaceae sp.* (for example coffee), *Theaceae sp.*, *Sterculiceae sp.*, *Rutaceae sp.* (for example lemons, oranges and grapefruit), *Solanaceae sp.* (for example tomatoes), *Liliaceae sp.*, *Asteraceae sp.* (for example lettuce), *Umbelliferae sp.*, *Cruciferae sp.*, *Chenopodiaceae sp.*, *Cucurbitaceae sp.* (for example cucumbers), *Alliaceae sp.* (for example leek, onions), *Papilionaceae sp.* (for example peas); major crop plants, such *Gramineae sp.* (for example maize, lawn, cereals such as wheat, rye, rice, barley, oats, millet and triticale), *Asteraceae sp.* (for example sunflowers), *Brassicaceae sp.* (for example white cabbage, red cabbage, broccoli, cauliflowers, Brussels sprouts, pak choi, kohlrabi, garden radish, and also oilseed rape, mustard, horseradish and cress), *Fabacae sp.* (for example beans, peas, peanuts), *Papilionaceae sp.* (for example soya beans), *Solanaceae sp.* (for example potatoes), *Chenopodiaceae sp.* (for example sugar beet, fodder beet, Swiss chard, beetroot); crop plants and ornamental plants in garden and forest; and also in each case genetically modified varieties of these plants.

As already mentioned above, it is possible to treat all plants and their parts according to the invention. In a preferred embodiment, wild plant species and plant cultivars, or those obtained by conventional biological breeding methods, such as crossing or protoplast fusion, and parts thereof, are treated. In a further preferred embodiment, transgenic plants and plant cultivars obtained by genetic engineering methods, if appropriate in combination with conventional methods (genetically modified organisms), and parts thereof are treated. The terms "parts", "parts of plants" and "plant parts" have been explained above. Particularly preferably, plants of the plant cultivars which are in each case commercially available or in use are treated according to the invention. Plant cultivars are to be understood as meaning plants having novel properties ("traits") which have been obtained by conventional breeding, by mutagenesis or by recombinant DNA techniques. These can be cultivars, bio- or genotypes.

The method of treatment according to the invention is used in the treatment of genetically modified organisms (GMOs), e.g. plants or seeds. Genetically modified plants (or transgenic plants) are plants of which a heterologous gene has been stably integrated into the genome. The expression "heterologous gene" essentially means a gene which is provided or assembled outside the plant and when introduced in the nuclear, chloroplastic or mitochondrial genome gives the transformed plant new or improved agronomic or other properties by expressing a protein or polypeptide of interest or by down regulating or silencing other gene(s) which are present in the plant (using for example, antisense technology, co-suppression technology or RNA interference – RNAi - technology). A heterologous gene that is located in the genome is also called a transgene. A transgene that is defined by its particular location in the plant genome is called a transformation or transgenic event.

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Depending on the plant species or plant cultivars, their location and growth conditions (soils, climate, vegetation period, diet), the treatment according to the invention may also result in super-additive ("synergistic") effects. Thus, for example, reduced application rates and/or a widening of the activity spectrum and/or an increase in the activity of the active compounds and compositions which can be used according to the invention, better plant growth, increased tolerance to high or low temperatures, increased tolerance to drought or to water or soil salt content, increased flowering performance, easier harvesting, accelerated maturation, higher harvest yields, bigger fruits, larger plant height, greener leaf color, earlier flowering, higher quality and/or a higher nutritional value of the harvested products, higher sugar concentration within the fruits, better storage stability and/or processability of the harvested products are possible, which exceed the effects which were actually to be expected.

At certain application rates, the active compound combinations according to the invention may also have a strengthening effect in plants. Accordingly, they are also suitable for mobilizing the defense system of the plant against attack by unwanted phytopathogenic fungi and/ or microorganisms and/or viruses. This may, if appropriate, be one of the reasons of the enhanced activity of the combinations according to the invention, for example against fungi. Plant-strengthening (resistance-inducing) substances are to be understood as meaning, in the present context, those substances or combinations of substances which are capable of stimulating the defense system of plants in such a way that, when subsequently inoculated with unwanted phytopathogenic fungi and/or microorganisms and/or viruses, the treated plants display a substantial degree of resistance to these phytopathogenic fungi and/or microorganisms and/or viruses, Thus, the substances according to the invention can be employed for protecting plants against attack by the abovementioned pathogens within a certain period of time after the treatment. The period of time within which protection is effected generally extends from 1 to 10 days, preferably 1 to 7 days, after the treatment of the plants with the active compounds.

Plants and plant cultivars which are preferably to be treated according to the invention include all plants which have genetic material which impart particularly advantageous, useful traits to these plants (whether obtained by breeding and/or biotechnological means).

Plants and plant cultivars which are also preferably to be treated according to the invention are resistant against one or more biotic stresses, i.e. said plants show a better defense against animal and microbial pests, such as against nematodes, insects, mites, phytopathogenic fungi, bacteria, viruses and/or viroids.

Plants and plant cultivars which may also be treated according to the invention are those plants which are resistant to one or more abiotic stresses. Abiotic stress conditions may include, for example, drought, cold

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temperature exposure, heat exposure, osmotic stress, flooding, increased soil salinity, increased mineral exposure, ozon exposure, high light exposure, limited availability of nitrogen nutrients, limited availability of phosphorus nutrients, shade avoidance.

Plants and plant cultivars which may also be treated according to the invention, are those plants characterized by enhanced yield characteristics. Increased yield in said plants can be the result of, for example, improved plant physiology, growth and development, such as water use efficiency, water retention efficiency, improved nitrogen use, enhanced carbon assimilation, improved photosynthesis, increased germination efficiency and accelerated maturation. Yield can furthermore be affected by improved plant architecture (under stress and non-stress conditions), including but not limited to, early flowering, flowering control for hybrid seed production, seedling vigor, plant size, internode number and distance, root growth, seed size, fruit size, pod size, pod or ear number, seed number per pod or ear, seed mass, enhanced seed filling, reduced seed dispersal, reduced pod dehiscence and lodging resistance. Further yield traits include seed composition, such as carbohydrate content, protein content, oil content and composition, nutritional value, reduction in anti-nutritional compounds, improved processability and better storage stability.

Plants that may be treated according to the invention are hybrid plants that already express the characteristic of heterosis or hybrid vigor which results in generally higher yield, vigor, health and resistance towards biotic and abiotic stress factors. Such plants are typically made by crossing an inbred male-sterile parent line (the female parent) with another inbred male-fertile parent line (the male parent). Hybrid seed is typically harvested from the male sterile plants and sold to growers. Male sterile plants can sometimes (e.g. in corn) be produced by detasseling, i.e. the mechanical removal of the male reproductive organs (or males flowers) but, more typically, male sterility is the result of genetic determinants in the plant genome. In that case, and especially when seed is the desired product to be harvested from the hybrid plants it is typically useful to ensure that male fertility in the hybrid plants is fully restored. This can be accomplished by ensuring that the male parents have appropriate fertility restorer genes which are capable of restoring the male fertility in hybrid plants that contain the genetic determinants responsible for male-sterility. Genetic determinants for male sterility may be located in the cytoplasm. Examples of cytoplasmic male sterility (CMS) were for instance described in Brassica species. However, genetic determinants for male sterility can also be located in the nuclear genome. Male sterile plants can also be obtained by plant biotechnology methods such as genetic engineering. A particularly useful means of obtaining male-sterile plants is described in WO 89/10396 in which, for example, a ribonuclease such as barnase is selectively expressed in the tapetum cells in the stamens. Fertility can then be restored by expression in the tapetum cells of a ribonuclease inhibitor such as barstar.

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Plants or plant cultivars (obtained by plant biotechnology methods such as genetic engineering) which may be treated according to the invention are herbicide-tolerant plants, i.e. plants made tolerant to one or more given herbicides. Such plants can be obtained either by genetic transformation, or by selection of plants containing a mutation imparting such herbicide tolerance.

Herbicide-tolerant plants are for example glyphosate-tolerant plants, i.e. plants made tolerant to the herbicide glyphosate or salts thereof. Plants can be made tolerant to glyphosate through different means. For example, glyphosate-tolerant plants can be obtained by transforming the plant with a gene encoding the enzyme 5-enolpyruvylshikimate-3-phosphate synthase (EPSPS). Examples of such EPSPS genes are the AroA gene (mutant CT7) of the bacterium *Salmonella typhimurium*, the CP4 gene of the bacterium *Agrobacterium sp*, the genes encoding a Petunia EPSPS, a Tomato EPSPS, or an Eleusine EPSPS. It can also be a mutated EPSPS. Glyphosate-tolerant plants can also be obtained by expressing a gene that encodes a glyphosate oxido-reductase enzyme. Glyphosate-tolerant plants can also be obtained by expressing a gene that encodes a glyphosate acetyl transferase enzyme. Glyphosate-tolerant plants can also be obtained by selecting plants containing naturally-occurring mutations of the above-mentioned genes.

Other herbicide resistant plants are for example plants that are made tolerant to herbicides inhibiting the enzyme glutamine synthase, such as bialaphos, phosphinothricin or glufosinate. Such plants can be obtained by expressing an enzyme detoxifying the herbicide or a mutant glutamine synthase enzyme that is resistant to inhibition. One such efficient detoxifying enzyme is an enzyme encoding a phosphinothricin acetyltransferase (such as the bar or pat protein from Streptomyces species). Plants expressing an exogenous phosphinothricin acetyltransferase are also described.

Further herbicide-tolerant plants are also plants that are made tolerant to the herbicides inhibiting the enzyme hydroxyphenylpyruvatedioxygenase (HPPD). Hydroxyphenylpyruvatedioxygenases are enzymes that catalyze the reaction in which para-hydroxyphenylpyruvate (HPP) is transformed into homogentisate. Plants tolerant to HPPD-inhibitors can be transformed with a gene encoding a naturally-occurring resistant HPPD enzyme, or a gene encoding a mutated HPPD enzyme. Tolerance to HPPD-inhibitors can also be obtained by transforming plants with genes encoding certain enzymes enabling the formation of homogentisate despite the inhibition of the native HPPD enzyme by the HPPD-inhibitor. Tolerance of plants to HPPD inhibitors can also be improved by transforming plants with a gene encoding an enzyme prephenate dehydrogenase in addition to a gene encoding an HPPD-tolerant enzyme.

Still further herbicide resistant plants are plants that are made tolerant to acetolactate synthase (ALS) inhibitors. Known ALS-inhibitors include, for example, sulfonylurea, imidazolinone, triazolopyrimidines, pyrimidiny-

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oxy(thio)benzoates, and/or sulfonylaminocarbonyltriazolinone herbicides. Different mutations in the ALS enzyme (also known as acetohydroxyacid synthase, AHAS) are known to confer tolerance to different herbicides and groups of herbicides. The production of sulfonylurea-tolerant plants and imidazolinone-tolerant plants is described in WO 1996/033270. Other imidazolinone-tolerant plants are also described. Further sulfonylurea- and imidazolinone-tolerant plants are also described in for example WO 2007/024782.

Other plants tolerant to imidazolinone and/or sulfonylurea can be obtained by induced mutagenesis, selection in cell cultures in the presence of the herbicide or mutation breeding as described for example for soybeans, for rice, for sugar beet, for lettuce, or for sunflower.

Plants or plant cultivars (obtained by plant biotechnology methods such as genetic engineering) which may also be treated according to the invention are insect-resistant transgenic plants, i.e. plants made resistant to attack by certain target insects. Such plants can be obtained by genetic transformation, or by selection of plants containing a mutation imparting such insect resistance.

An "insect-resistant transgenic plant", as used herein, includes any plant containing at least one transgene comprising a coding sequence encoding:

1) an insecticidal crystal protein from *Bacillus thuringiensis* or an insecticidal portion thereof, such as the insecticidal crystal proteins listed online at: http://www.lifesci.sussex.ac.uk/Home/Neil_Crickmore/Bt/, or insecticidal portions thereof, e.g., proteins of the Cry protein classes Cry1Ab, Cry1Ac, Cry1F, Cry2Ab, Cry3Aa, or Cry3Bb or insecticidal portions thereof; or

2) a crystal protein from *Bacillus thuringiensis* or a portion thereof which is insecticidal in the presence of a second other crystal protein from *Bacillus thuringiensis* or a portion thereof, such as the binary toxin made up of the Cry34 and Cry35 crystal proteins; or

3) a hybrid insecticidal protein comprising parts of different insecticidal crystal proteins from *Bacillus thuringiensis,* such as a hybrid of the proteins of 1) above or a hybrid of the proteins of 2) above, e.g., the Cry1A.105 protein produced by corn event MON98034 (WO 2007/027777); or

4) a protein of any one of 1) to 3) above wherein some, particularly 1 to 10, amino acids have been replaced by another amino acid to obtain a higher insecticidal activity to a target insect species, and/or to expand the range of target insect species affected, and/or because of changes introduced into the encoding DNA during cloning or transformation, such as the Cry3Bb1 protein in corn events MON863 or MON88017, or the Cry3A protein in corn event MIR604;

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5) an insecticidal secreted protein from *Bacillus thuringiensis* or *Bacillus cereus*, or an insecticidal portion thereof, such as the vegetative insecticidal (VIP) proteins listed at: http://www.lifesci.sussex.ac.uk/home/Neil_Crickmore/Bt/vip.html, e.g. proteins from the VIP3Aa protein class; or

6) secreted protein from *Bacillus thuringiensis* or *Bacillus cereus* which is insecticidal in the presence of a second secreted protein from *Bacillus thuringiensis* or *B. cereus*, such as the binary toxin made up of the VIP1A and VIP2A proteins; or

7) hybrid insecticidal protein comprising parts from different secreted proteins from *Bacillus thuringiensis* or *Bacillus cereus*, such as a hybrid of the proteins in 1) above or a hybrid of the proteins in 2) above; or

8) protein of any one of 1) to 3) above wherein some, particularly 1 to 10, amino acids have been replaced by another amino acid to obtain a higher insecticidal activity to a target insect species, and/or to expand the range of target insect species affected, and/or because of changes introduced into the encoding DNA during cloning or transformation (while still encoding an insecticidal protein), such as the VIP3Aa protein in cotton event COT102.

Of course, an insect-resistant transgenic plant, as used herein, also includes any plant comprising a combination of genes encoding the proteins of any one of the above classes 1 to 8. In one embodiment, an insect-resistant plant contains more than one transgene encoding a protein of any one of the above classes 1 to 8, to expand the range of target insect species affected when using different proteins directed at different target insect species, or to delay insect resistance development to the plants by using different proteins insecticidal to the same target insect species but having a different mode of action, such as binding to different receptor binding sites in the insect.

Plants or plant cultivars (obtained by plant biotechnology methods such as genetic engineering) which may also be treated according to the invention are tolerant to abiotic stresses. Such plants can be obtained by genetic transformation, or by selection of plants containing a mutation imparting such stress resistance. Particularly useful stress tolerance plants include:

a. plants which contain a transgene capable of reducing the expression and/or the activity of poly(ADP-ribose)polymerase (PARP) gene in the plant cells or plants

b. plants which contain a stress tolerance enhancing transgene capable of reducing the expression and/or the activity of the PARG encoding genes of the plants or plants cells.

c. plants which contain a stress tolerance enhancing transgene coding for a plant-functional enzyme of the nicotinamide adenine dinucleotide salvage synthesis pathway including nicotinamidase, nicoti-

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nate phosphoribosyltransferase, nicotinic acid mononucleotide adenyl transferase, nicotinamide adenine dinucleotide synthetase or nicotine amide phosphorybosyltransferase.

Plants or plant cultivars (obtained by plant biotechnology methods such as genetic engineering) which may also be treated according to the invention show altered quantity, quality and/or storage-stability of the harvested product and/or altered properties of specific ingredients of the harvested product such as :

1) transgenic plants which synthesize a modified starch, which in its physical-chemical characteristics, in particular the amylose content or the amylose/amylopectin ratio, the degree of branching, the average chain length, the side chain distribution, the viscosity behaviour, the gelling strength, the starch grain size and/or the starch grain morphology, is changed in comparison with the synthesised starch in wild type plant cells or plants, so that this is better suited for special applications.

2) transgenic plants which synthesize non starch carbohydrate polymers or which synthesize non starch carbohydrate polymers with altered properties in comparison to wild type plants without genetic modification. Examples are plants producing polyfructose, especially of the inulin and levan-type, plants producing alpha 1,4 glucans, plants producing alpha-1,6 branched alpha-1,4-glucans, plants producing alternan,

3) transgenic plants which produce hyaluronan.

Plants or plant cultivars (that can be obtained by plant biotechnology methods such as genetic engineering) which may also be treated according to the invention are plants, such as cotton plants, with altered fiber characteristics. Such plants can be obtained by genetic transformation or by selection of plants contain a mutation imparting such altered fiber characteristics and include:

a) Plants, such as cotton plants, containing an altered form of cellulose synthase genes,

b) Plants, such as cotton plants, containing an altered form of rsw2 or rsw3 homologous nucleic acids,

c) Plants, such as cotton plants, with increased expression of sucrose phosphate synthase,

d) Plants, such as cotton plants, with increased expression of sucrose synthase,

e) Plants, such as cotton plants, wherein the timing of the plasmodesmatal gating at the basis of the fiber cell is altered, e.g. through downregulation of fiberselective β 1,3-glucanase,

f) Plants, such as cotton plants, having fibers with altered reactivity, e.g. through the expression of N-acteylglucosaminetransferase gene including nodC and chitinsynthase genes.

Plants or plant cultivars (that can be obtained by plant biotechnology methods such as genetic engineering) which may also be treated according to the invention are plants, such as oilseed rape or related Brassica

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plants, with altered oil profile characteristics. Such plants can be obtained by genetic transformation or by selection of plants contain a mutation imparting such altered oil characteristics and include:

a) Plants, such as oilseed rape plants, producing oil having a high oleic acid content,

b) Plants such as oilseed rape plants, producing oil having a low linolenic acid content,

c) Plant such as oilseed rape plants, producing oil having a low level of saturated fatty acids.

Particularly useful transgenic plants which may be treated according to the invention are plants which comprise one or more genes which encode one or more toxins, such as the following which are sold under the trade names YIELD GARD® (for example maize, cotton, soya beans), KnockOut® (for example maize), BiteGard® (for example maize), Bt-Xtra® (for example maize), StarLink® (for example maize), Bollgard® (cotton), Nucotn® (cotton), Nucotn 33B®(cotton), NatureGard® (for example maize), Protecta® and NewLeaf® (potato). Examples of herbicide-tolerant plants which may be mentioned are maize varieties, cotton varieties and soya bean varieties which are sold under the trade names Roundup Ready® (tolerance to glyphosate, for example maize, cotton, soya bean), Liberty Link® (tolerance to phosphinotricin, for example oilseed rape), IMI® (tolerance to imidazolinones) and STS® (tolerance to sulphonylureas, for example maize). Herbicide-resistant plants (plants bred in a conventional manner for herbicide tolerance) which may be mentioned include the varieties sold under the name Clearfield® (for example maize).

Particularly useful transgenic plants which may be treated according to the invention are plants containing transformation events, or combination of transformation events, that are listed for example in the databases from various national or regional regulatory agencies (see for example http://gmoinfo.jrc.it/gmp_browse.aspx and http://www.agbios.com/dbase.php).

In material protection the substances of the invention may be used for the protection of technical materials against infestation and destruction by undesirable fungi and/or microorganisms.

Technical materials are understood to be in the present context non-living materials that have been prepared for use in engineering. For example, technical materials that are to be protected against micro-biological change or destruction by the active materials of the invention can be adhesives, glues, paper and cardboard, textiles, carpets, leather, wood, paint and plastic articles, cooling lubricants and other materials that can be infested or destroyed by micro-organisms. Within the context of materials to be protected are also parts of production plants and buildings, for example cooling circuits, cooling and heating systems, air conditioning and ventilation systems, which can be adversely affected by the propagation of fungi and/or microorganisms. Within the context of the present invention, preferably mentioned as technical materials are adhesives, glues, paper and cardboard, leather, wood, paints, cooling lubricants and heat exchanger liquids, par-

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ticularly preferred is wood. The combinations according to the invention can prevent disadvantageous effects like decaying, dis- and decoloring, or molding. The active compound combinations and compositions according to the invention can likewise be employed for protecting against colonization of objects, in particular ship hulls, sieves, nets, buildings, quays and signalling installations, which are in contact with sea water or brackish water.

The method of treatment according to the invention can also be used in the field of protecting storage goods against attack of fungi and microorganisms. According to the present invention, the term "storage goods" is understood to denote natural substances of vegetable or animal origin and their processed forms, which have been taken from the natural life cycle and for which long-term protection is desired. Storage goods of vegetable origin, such as plants or parts thereof, for example stalks, leafs, tubers, seeds, fruits or grains, can be protected in the freshly harvested state or in processed form, such as pre-dried, moistened, comminuted, ground, pressed or roasted. Also falling under the definition of storage goods is timber, whether in the form of crude timber, such as construction timber, electricity pylons and barriers, or in the form of finished articles, such as furniture or objects made from wood. Storage goods of animal origin are hides, leather, furs, hairs and the like. The combinations according the present invention can prevent disadvantageous effects such as decay, discoloration or mold. Preferably "storage goods" is understood to denote natural substances of vegetable origin and their processed forms, more preferably fruits and their processed forms, such as pomes, stone fruits, soft fruits and citrus fruits and their processed forms.

Some pathogens of fungal diseases which can be treated according to the invention may be mentioned by way of example, but not by way of limitation:

Diseases caused by powdery mildew pathogens, such as, for example, Blumeria species, such as, for example, Blumeria graminis; Podosphaera species, such as, for example, Podosphaera leucotricha; Sphaerotheca species, such as, for example, Sphaerotheca fuliginea; Uncinula species, such as, for example, Uncinula necator;

Diseases caused by rust disease pathogens, such as, for example, Gymnosporangium species, such as, for example, Gymnosporangium sabinae; Hemileia species, such as, for example, Hemileia vastatrix; Phakopsora species, such as, for example, Phakopsora pachyrhizi and Phakopsora meibomiae; Puccinia species, such as, for example, Puccinia recondita or Puccinia triticina; Uromyces species, such as, for example, Uromyces appendiculatus;

Diseases caused by pathogens from the group of the Oomycetes, such as, for example, Bremia species, such as, for example, Bremia lactucae; Peronospora species, such as, for example, Peronospora pisi or P. brassi-

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cae; Phytophthora species, such as, for example Phytophthora infestans; Plasmopara species, such as, for example, Plasmopara viticola; Pseudoperonospora species, such as, for example, Pseudoperonospora humuli or Pseudoperonospora cubensis; Pythium species, such as, for example, Pythium ultimum;

Leaf blotch diseases and leaf wilt diseases caused, for example, by Alternaria species, such as, for example, Alternaria solani; Cercospora species, such as, for example, Cercospora beticola; Cladiosporium species, such as, for example, Cladiosporium cucumerinum; Cochliobolus species, such as, for example, Cochliobolus sativus (conidia form: Drechslera, Syn: Helminthosporium); Colletotrichum species, such as, for example, Colletotrichum lindemuthanium; Cycloconium species, such as, for example, Cycloconium oleaginum; Diaporthe species, such as, for example, Diaporthe citri; Elsinoe species, such as, for example, Elsinoe fawcettii; Gloeosporium species, such as, for example, Gloeosporium laeticolor; Glomerella species, such as, for example, Glomerella cingulata; Guignardia species, such as, for example, Guignardia bidwelli; Leptosphaeria species, such as, for example, Leptosphaeria maculans; Magnaporthe species, such as, for example, Magnaporthe grisea; Microdochium species, such as, for example, Microdochium nivale; Mycosphaerella species, such as, for example, Mycosphaerella graminicola and M. fijiensis; Phaeosphaeria species, such as, for example, Phaeosphaeria nodorum; Pyrenophora species, such as, for example, Pyrenophora teres; Ramularia species, such as, for example, Ramularia collo-cygni; Rhynchosporium species, such as, for example, Rhynchosporium secalis; Septoria species, such as, for example, Septoria apii; Typhula species, such as, for example, Typhula incarnata; Venturia species, such as, for example, Venturia inaequalis;

Root and stem diseases caused, for example, by Corticium species, such as, for example, Corticium graminearum; Fusarium species, such as, for example, Fusarium oxysporum; Gaeumannomyces species, such as, for example, Gaeumannomyces graminis; Rhizoctonia species, such as, for example Rhizoctonia solani; Tapesia species, such as, for example, Tapesia acuformis; Thielaviopsis species, such as, for example, Thielaviopsis basicola;

Ear and panicle diseases (including maize cobs) caused, for example, by Alternaria species, such as, for example, Alternaria spp.; Aspergillus species, such as, for example, Aspergillus flavus; Cladosporium species, such as, for example, Cladosporium cladosporioides; Claviceps species, such as, for example, Claviceps purpurea; Fusarium species, such as, for example, Fusarium culmorum; Gibberella species, such as, for example, Gibberella zeae; Monographella species, such as, for example, Monographella nivalis; Septoria species, such as for example, Septoria nodorum;

Diseases caused by smut fungi, such as, for example, Sphacelotheca species, such as, for example, Sphacelotheca reiliana; Tilletia species, such as, for example, Tilletia caries; T. controversa; Urocystis species, such as, for example, Urocystis occulta; Ustilago species, such as, for example, Ustilago nuda; U. nuda tritici;

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Fruit rot caused, for example, by Aspergillus species, such as, for example, Aspergillus flavus; Botrytis species, such as, for example, Botrytis cinerea; Penicillium species, such as, for example, Penicillium expansum and P. purpurogenum; Sclerotinia species, such as, for example, Sclerotinia sclerotiorum; Verticilium species, such as, for example, Verticilium alboatrum;

Seed- and soil-borne rot and wilt diseases, and also diseases of seedlings, caused, for example, by Fusarium species, such as, for example, Fusarium culmorum; Phytophthora species, such as, for example, Phytophthora cactorum; Pythium species, such as, for example, Pythium ultimum; Rhizoctonia species, such as, for example, Rhizoctonia solani; Sclerotium species, such as, for example, Sclerotium rolfsii;

Cancerous diseases, galls and witches' broom caused, for example, by Nectria species, such as, for example, Nectria galligena;

Wilt diseases caused, for example, by Monilinia species, such as, for example, Monilinia laxa;

Deformations of leaves, flowers and fruits caused, for example, by Taphrina species, such as, for example, Taphrina deformans;

Degenerative diseases of woody plants caused, for example, by Esca species, such as, for example, Phaemoniella clamydospora and Phaeoacremonium aleophilum and Fomitiporia mediterranea;

Diseases of flowers and seeds caused, for example, by Botrytis species, such as, for example, Botrytis cinerea;

Diseases of plant tubers caused, for example, by Rhizoctonia species, such as, for example, Rhizoctonia solani; Helminthosporium species, such as, for example, Helminthosporium solani;

Diseases caused by bacteriopathogens, such as, for example, Xanthomonas species, such as, for example, Xanthomonas campestris pv. oryzae; Pseudomonas species, such as, for example, Pseudomonas syringae pv. lachrymans; Erwinia species, such as, for example, Erwinia amylovora.

Preference is given to controlling the following diseases of soya beans:

Fungal diseases on leaves, stems, pods and seeds caused, for example, by alternaria leaf spot (Alternaria spec. atrans tenuissima), anthracnose (Colletotrichum gloeosporoides dematium var. truncatum), brown spot (Septoria glycines), cercospora leaf spot and blight (Cercospora kikuchii), choanephora leaf blight (Choanephora infundibulifera trispora (Syn.)), dactuliophora leaf spot (Dactuliophora glycines), downy mildew (Peronospora manshurica), drechslera blight (Drechslera glycini), frogeye leaf spot (Cercospora sojina), leptosphaerulina leaf spot (Leptosphaerulina trifolii), phyllostica leaf spot (Phyllosticta sojaecola), pod and stem blight (Phomopsis sojae), powdery mildew (Microsphaera diffusa), pyrenochaeta leaf spot (Pyrenochaeta glycines), rhizoctonia aerial, foliage, and web blight (Rhizoctonia solani), rust (Phakopsora pachyrhizi Phakopsora meibomiae), scab (Sphaceloma glycines), stemphylium leaf blight (Stemphylium botryosum), target spot (Corynespora cassiicola).

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Fungal diseases on roots and the stem base caused, for example, by black root rot (Calonectria crotalariae), charcoal rot (Macrophomina phaseolina), fusarium blight or wilt, root rot, and pod and collar rot (Fusarium oxysporum, Fusarium orthoceras, Fusarium semitectum, Fusarium equiseti), mycoleptodiscus root rot (Mycoleptodiscus terrestris), neocosmospora (Neocosmopspora vasinfecta), pod and stem blight (Diaporthe phaseolorum), stem canker (Diaporthe phaseolorum var. caulivora), phytophthora rot (Phytophthora megasperma), brown stem rot (Phialophora gregata), pythium rot (Pythium aphanidermatum, Pythium irregulare, Pythium debaryanum, Pythium myriotylum, Pythium ultimum), rhizoctonia root rot, stem decay, and damping-off (Rhizoctonia solani), sclerotinia stem decay (Sclerotinia sclerotiorum), sclerotinia Southern blight (Sclerotinia rolfsii), thielaviopsis root rot (Thielaviopsis basicola).

It is also possible to control resistant strains of the organisms mentioned above.

Microorganisms capable of degrading or changing the industrial materials which may be mentioned are, for example, bacteria, fungi, yeasts, algae and slime organisms. The active compounds according to the invention preferably act against fungi, in particular moulds, wood-discolouring and wood-destroying fungi (Basidiomycetes) and against slime organisms and algae. Microorganisms of the following genera may be mentioned as examples: Alternaria, such as Alternaria tenuis, Aspergillus, such as Aspergillus niger, Chaetomium, such as Chaetomium globosum, Coniophora, such as Coniophora puetana, Lentinus, such as Lentinus tigrinus, Penicillium, such as Penicillium glaucum, Polyporus, such as Polyporus versicolor, Aureobasidium, such as Aureobasidium pullulans, Sclerophoma, such as Sclerophoma pityophila, Trichoderma, such as Trichoderma viride, Escherichia, such as Escherichia coli, Pseudomonas, such as Pseudomonas aeruginosa, and Staphylococcus, such as Staphylococcus aureus.

In addition, the compounds of the formula (I) according to the invention also have very good antimycotic activity. They have a very broad antimycotic activity spectrum in particular against dermatophytes and yeasts, moulds and diphasic fungi (for example against Candida species such as Candida albicans, Candida glabrata) and Epidermophyton floccosum, Aspergillus species such as Aspergillus niger and Aspergillus fumigatus, Trichophyton species such as Trichophyton mentagrophytes, Microsporon species such as Microsporon canis and audouinii. The list of these fungi by no means limits the mycotic spectrum which can be covered, but is only for illustration.

When applying the compounds according to the invention the application rates can be varied within a broad range. The dose of active compound/application rate usually applied in the method of treatment according to the invention is generally and advantageously

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- for treatment of part of plants, e.g. leafs (foliar treatment): from 0.1 to 10,000 g/ha, preferably from 10 to 1,000 g/ha, more preferably from 50 to 300g/ha; in case of drench or drip application, the dose can even be reduced, especially while using inert substrates like rockwool or perlite;
- for seed treatment: from 2 to 200 g per 100 kg of seed, preferably from 3 to 150 g per 100 kg of seed, more preferably from 2.5 to 25 g per 100 kg of seed, even more preferably from 2.5 to 12.5 g per 100 kg of seed;
- for soil treatment: from 0.1 to 10,000 g/ha, preferably from 1 to 5,000 g/ha.

The doses herein indicated are given as illustrative examples of the method according to the invention. A person skilled in the art will know how to adapt the application doses, notably according to the nature of the plant or crop to be treated.

The combination according to the invention can be used in order to protect plants within a certain time range after the treatment against pests and/or phytopathogenic fungi and/or microorganisms. The time range, in which protection is effected, spans in general 1 to 28 days, preferably 1 to 14 days, more preferably 1 to 10 days, even more preferably 1 to 7 days after the treatment of the plants with the combinations or up to 200 days after the treatment of plant propagation material.

Furthermore combinations and compositions according to the invention may also be used to reduce the contents of mycotoxins in plants and the harvested plant material and therefore in foods and animal feed stuff made therefrom. Especially but not exclusively the following mycotoxins can be specified: Deoxynivalenole (DON), Nivalenole, 15-Ac-DON, 3-Ac-DON, T2- und HT2- Toxins, Fumonisines, Zearalenone Moniliformine, Fusarine, Diaceotoxyscirpenole (DAS), Beauvericine, Enniatine, Fusaroproliferine, Fusarenole, Ochratoxines, Patuline, Ergotalkaloides und Aflatoxines, which are caused for example by the following fungal diseases: *Fusarium spec.*, like *Fusarium acuminatum, F. avenaceum, F. crookwellense, F. culmorum, F. graminearum (Gibberella zeae), F. equiseti, F. fujikoroi, F. musarum, F. oxysporum, F. proliferatum, F. poae, F. pseudograminearum, F. sambucinum, F. scirpi, F. semitectum, F. solani, F. sporotrichoides, F. langsethiae, F. subglutinans, F. tricinctum, F. verticillioides* and others but also by *Aspergillus spec.*, *Penicillium spec.*, *Claviceps purpurea, Stachybotrys spec.* and others.

The good fungicidal activity of the active compound combinations according to the invention is evident from the example below. While the individual active compounds exhibit weaknesses with regard to the fungicidal activity, the combinations have an activity which exceeds a simple addition of activities.
A synergistic effect of fungicides is always present when the fungicidal activity of the active compound combinations exceeds the total of the activities of the active compounds when applied individually.

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The expected activity for a given combination of two active compounds can be calculated as follows (cf. Colby, S.R., "Calculating Synergistic and Antagonistic Responses of Herbicide Combinations", *Weeds* **1967**, *15*, 20-22):

If

X is the efficacy when active compound A is applied at an application rate of m ppm (or g/ha),

Y is the efficacy when active compound B is applied at an application rate of n ppm (or g/ha),

E is the efficacy when the active compounds A and B are applied at application rates of m and n ppm (or g/ha), respectively, and

then $E = X + Y - \frac{X \cdot Y}{100}$

The degree of efficacy, expressed in % is denoted. 0 % means an efficacy which corresponds to that of the control while an efficacy of 100 % means that no disease is observed.

If the actual fungicidal activity exceeds the calculated value, then the activity of the combination is superadditive, i.e. a synergistic effect exists. In this case, the efficacy which was actually observed must be greater than the value for the expected efficacy (E) calculated from the abovementioned formula.

A further way of demonstrating a synergistic effect is the method of Tammes (cf. "Isoboles, a graphic representation of synergism in pesticides" in *Neth. J. Plant Path.*, **1964**, *70*, 73-80).

The invention is illustrated by the examples below. However, the invention is not limited to the examples.

Examples

2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2,6-difluoro-4-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone (I-4)

***tert*-butyl 4-{4-[5-(2,6-difluoro-4-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidine-1-carboxylate**

To a solution of *tert*-butyl 4-{4-[(Z/E)-(hydroxyimino)methyl]-1,3-thiazol-2-yl}piperidine-1-carboxylate (1.75 g) and 3,5-difluoro-4-vinylphenol (1.05 g) in ethyl acetate (45 ml) were added, at room temperature, potassium bicarbonate (2.81 g) and N-chlorosuccinimide (0.90 g), and then one drop of water. The reaction mixture was stirred at 60°C for 4 hours, then admixed with ethyl acetate and water and extracted with ethyl acetate. The organic extracts were dried over sodium sulphate and concentrated under reduced pressure. The

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residue was purified by chromatography. This gave *tert*-butyl 4-{4-[5-(2,6-difluoro-4-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidine-1-carboxylate (0.62 g).

^{1}H NMR (DMSO-d_6, 400 MHz): δ_{ppm} : 1.41 (s, 9H), 1.48-1.62 (m, 2H), 1.98-2.08 (m, 2H), 2.81-2.96 (m, 2H), 3.45 (dd, 1H), 3.80 (dd, 1H), 3.96-4.06 (m, 2H), 5.87 (dd, 1H), 6.50 (m, 2H), 7.98 (s, 1H), 10.50 (s, 1H)

logP (HCOOH): 3,24

MS (ESI): 366 ([M-C(CH3)$_3$OCO+H]$^+$)

4-{4-[5-(2,6-difluoro-4-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidinium chloride

To a solution of *tert*-butyl 4-{4-[5-(2,6-difluoro-4-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidine-1-carboxylate (620 mg) in dichloromethane (4 ml) was added dropwise, at 0°C, a 4 molar solution of hydrogen chloride in 1,4-dioxane (8.5 ml). The reaction mixture was stirred at 0°C and then gradually warmed to room temperature. After stirring for 3 h at room temperature, the solvent and excess hydrogen chloride were removed. This gave 4-{4-[5-(2,6-difluoro-4-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidinium chloride (492 mg).

^{1}H NMR (DMSO-d_6, 400 MHz): δ_{ppm} : 1.41 (s, 9H), 1.48-1.62 (m, 2H), 1.98-2.08 (m, 2H), 2.81-2.96 (m, 2H), 3.45 (dd, 1H), 3.80 (dd, 1H), 3.96-4.06 (m, 2H), 5.87 (dd, 1H), 6.50 (m, 2H), 7.98 (s, 1H), 10.50 (s, 1H)

logP (HCOOH): 0.98

MS (ESI): 366 ([M-Cl+H]$^+$)

2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-(4-{4-[5-(2,6-difluoro-4-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)ethanone

Solution A: To a solution of [3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]acetic acid (305 mg) in dichloromethane (10 ml) were added dropwise, at room temperature, one drop of N,N-dimethylformamide and oxa-

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lyl chloride (0.320 ml). After stirring at room temperature for two hours, the solvent was removed and the residue was dissolved again in dichloromethane (5 ml) (solution A).

To a solution of 4-{4-[5-(2,6-difluoro-4-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidinium chloride (492 mg) in dichloromethane (14 ml) was added, at room temperature, triethylamine (1.7 ml). After 15 minutes, solution A was added dropwise. After stirring at room temperature overnight, the reaction mixture was admixed with water and extracted with ethyl acetate. The organic extracts were dried over sodium sulphate and concentrated under reduced pressure. The residue was purified by chromatography. This gave 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-(4-{4-[5-(2,6-difluoro-4-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)ethanone (360 mg).

^{1}H NMR (DMSO-d_6, 400 MHz): δ_{ppm} : 1.51-1.61 (m, 1H), 1.77-1.85 (m, 1H), 2.06-2.17 (m, 2H), 2.79-2.87 (m, 1H), 3.23-3.31 (m, 1H), 3.46 (dd, 1H), 3.81 (dd, 1H), 3.93-4.00 (m, 1H), 4.31-4.39 (m, 1H), 5.32-5.48 (m, 2H), 5.88 (dd, 1H), 6.49 (m, 2H), 6.91 (s, 1H), 7.04 (t, 1H), 7.18 (t, 1H), 8.01 (s, 1H), 10.72 (s, 1H)

logP (HCOOH): 2.58

MS (ESI): 574 ([M+H]$^+$)

2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2,6-difluoro-4-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone

To a solution of 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-(4-{4-[5-(2,6-difluoro-4-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)ethanone (384 mg) and potassium carbonate (138 mg) in N,N-dimethylformamide (18 ml) are added, at room temperature, potassium iodide (61 mg) and 3-bromoprop-1-yne (127 mg) . The reaction mixture is stirred at 80°C for 9 h. Then the mixture is admixed with dilute hydrochloric acid and extracted with ethyl acetate. The combined organic phases are dried over sodium sulphate and concentrated. Purification by column chromatography gives 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2,6-difluoro-4-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone (60 mg).

^{1}H NMR (DMSO-d_6, 400 MHz): δ_{ppm} : 1.51-1.65 (m, 1H), 1.74-1.88 (m, 1H), 2.05-2.19 (m, 2H), 2.80-2.91 (m, 1H), 3.50 (dd, 1H), 3.65 (t, 1H), 3.85 (dd, 1H), 3.93-4.03 (m, 1H), 4.31-4.41 (m, 1H), 4.88 (d, 2H), 5.31-5.48 (m, 2H), 5.92 (dd, 1H), 6.85 (m, 2H), 6.90 (s, 1H), 7.02 (t, 1H), 7.18 (t, 1H), 8.02 (s, 1H)

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logP (HCOOH): 3.30

MS (ESI): 612 ($[M+H]^+$)

2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2,6-difluoro-3-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone (I-7)

tert-butyl 4-{4-[5-(2,6-difluoro-3-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidine-1-carboxylate

To a solution of *tert*-butyl 4-{4-[(hydroxyimino)methyl]-1,3-thiazol-2-yl}piperidine-1-carboxylate (1.278 g) in ethyl acetate (80 ml) was added, at room temperature, N-chlorosuccinimide (658 mg). After stirring at 60°C for 30 min, 2,4-difluoro-3-vinylphenol (705 mg), potassium hydrogencarbonate (822 mg) and then one drop of water were added, at room temperature, to the reaction mixture. After stirring overnight at room temperature, the reaction mixture was admixed with ethyl acetate and water and extracted with ethyl acetate. The organic extracts were dried over sodium sulphate and concentrated under reduced pressure. The residue was purified by chromatography. This gave tert-butyl 4-{4-[5-(2,6-difluoro-3-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidine-1-carboxylate (658 mg).

^{1}H NMR (DMSO-d_6, 400 MHz): δ_{ppm} : 9.92 (s, 1H), 8.01 (s, 1H), 7.04-6.90 (m, 2H), 5.96 (dd, 1H), 4.01 (bd, 2H), 3.94-3.84 (m, 1H), 3.50 (dd, 1H), 2.10-2.00 (m, 2H), 1.63-1.50 (m, 2H), 1.42 (s, 9H)

2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-(4-{4-[5-(2,6-difluoro-3-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)ethanone

To a solution of tert-butyl 4-{4-[5-(2,6-difluoro-3-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidine-1-carboxylate (3.92 g) in dichloromethane (15 ml) was added dropwise, at 0°C, a 4 molar solution of hydrogen chloride (10 eq.) in 1,4-dioxane. The reaction mixture was stirred at 0°C and then gradually warmed to room temperature. After stirring for 5 hours, the solvent and excess hydrogen chloride were removed. This gave 4-{4-[5-(2,6-difluoro-3-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidinium chloride. (compound A)

To a solution of [3,5-bis-(difluoromethyl)-1H-pyrazol-1-yl]acetic acid (2 g) in dichloromethane (40 ml) are added, at 0°C, oxalyl chloride (3.273 g) and one drop of N,N-dimethylformamide. The reaction mixture is stirred at room temperature for 2 hours. The solvent and the excess reagent are removed under reduced pressure. The solid residue is again dissolved in dichloromethane (15 ml) and, at 0°C, added dropwise to a solu-

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tion of 4-{4-[5-(2,6-difluoro-3-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidinium chloride (compound A) and triethylamine (5.0 eq.) in dichloromethane (100 ml). The reaction mixture is stirred at room temperature overnight. Then it is admixed with concentrated sodium hydrogencarbonate solution, and the aqueous phase is removed and extracted with ethyl acetate. The combined organic phases are dried over sodium sulphate and concentrated. Purification by column chromatography gives 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-(4-{4-[5-(2,6-difluoro-3-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)ethanone (1.818 g).

^{1}H NMR (DMSO-d_6, 400 MHz): δ_{ppm} : 9.91 (s, 1H), 8.03 (s, 1H), 7.18 (t, 1H), 7.03 (t, 1H), 7.02-6.88 (m, 3H), 5.96 (dd, 1H), 5.40 (q, 2H), 4.36 (bd, 1H), 4.02-3.84 (m, 2H), 3.55 (dd, 1H), 3.45-3.22 (m, 2H), 2.84 (t, 1H), 2.11 (t, 2H), 1.88-1.75 (m, 1H), 1.65-1.50 (m, 1H)

logP (HCOOH): 2.61

2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2,6-difluoro-3-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

To a solution of 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-(4-{4-[5-(2,6-difluoro-3-hydroxyphenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)ethanone (1.82 g) and potassium carbonate (657 mg) in N,N-dimethylformamide (15 ml)are added, at room temperature, potassium iodide (289 mg) and 3-bromoprop-1-yne (755 mg)) (80 wt %in toluene). The reaction mixture is stirred at 80°C for 4 h. Then the mixture is admixed with saturated aqueous solution of ammonium chloride and extracted with ethyl acetate. The combined organic phases are dried over sodium sulphate and concentrated. Purification by column chromatography gives 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2,6-difluoro-3-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone, (1.68 g).

^{1}H NMR (DMSO-d_6, 400 MHz): δ_{ppm} : 8.03 (s, 1H), 7.46-7.26 (m, 1H), 7.18 (t, 1H), 7.20-7.08 (m, 1H), 7.03 (t, 1H), 6.91 (s, 1H), 5.99 (dd, 1H), 5.40 (q, 2H), 4.89 (d, 2H), 4.35 (bs, 1H), 4.06-3.85 (m, 2H), 3.64 (t, 1H), 3.54 (dd, 1H), 3.46-3.21 (m, 2H), 2.84 (t, 1H), 2.12 (t, 2H), 1.89-1.75 (m, 1H), 1.65-1.50 (m, 1H).

logP (HCOOH): 3.17

The following examples can be synthesized accordingly:

(I-1) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone log p: 3,24[b]; 3,34[c]

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(I-2) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[4-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone log p: 3,08[b]; 3,14[c]

(I-3) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[3-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone log p: 3,16[b]; 3,24[c]

(I-5) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-fluoro-6-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone log p: 3,15[b]; 3,18[c]

(I-6) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-chloro-6-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone log p: 3,51[a]; 3,4[b]

(I-8) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[5-fluoro-2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone log p: 3,37[b]; 3,44[c]

(I-9) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[4-methoxy-2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone log p: 3,25[b]; 3,2[c]

(I-10) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[3-fluoro-2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone log p: 3,37[b]; 3,48[c]

Measurement of logP values was performed according EEC directive 79/831 Annex V.A8 by HPLC (High Performance Liquid

Chromatography) on reversed phase columns with the following methods:

[a] Measurement was done at pH 2.3 with 0,1% phosphoric acid and acetonitrile as eluent.

[b]measurement of LC-MS was done at pH 2,7 with 0,1 % formic acid in water and with acetonitrile (contains 0,1% formic acid) as eluent with a linear gradient from 10 % acetonitrle to 95 % acetonitrile.

[c] Measurement with LC-MS was done at pH 7.8 with 0,001 molar ammonium hydrogen carbonate solution in water as eluent with a linear gradient from 10 % acetonitrile to 95 % acetonitrile.

Calibration was done with not branched alkan2-ones (with 3 to 16 carbon atoms) with known logP-values (measurement of logP values using retention times with linear interpolation between successive alkanones).. lambda-maX-values were determined using UV-spectra from 200 nm to 400 nm and the peak values of the chromatographic signals.

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NMR Peak lists

1H-NMR data of selected examples are written in form of 1H-NMR-peak lists. To each signal peak are listed the δ-value in ppm and the signal intensity with space as delimiter. Between the δ-value – signal intensity pairs are semicolons as delimiters.

The peak list of an example has therefore the form:

δ_1 intensity$_1$;δ_2 intensity$_2$;.....;δ_i intensity$_i$;.....; δ_n intensity$_n$

The solvent in which the NMR spectrum was measured is written in squared brackets behind the example number and prior to the NMR-Peak list

Example No. I-1 [DMSO-D_6] 8.0055 16.00;7.3472 1.39;7.3429 1.89;7.3238 8.76;7.3048 10.15;7.1707 5.98;7.1567 3.82;7.1514 4.37;7.1317 3.60;7.0375 2.99;7.0210 8.97;7.0035 4.27;6.9848 2.03;6.8977 5.49;6.8852 3.32;5.8869 2.12;5.8691 2.50;5.8594 2.52;5.8413 2.24;5.4480 1.14;5.4048 4.22;5.3631 4.23;5.3208 1.12;4.8765 12.42;4.8706 12.41;4.3586 1.31;4.3257 1.38;3.9762 1.35;3.9425 1.47;3.8964 2.48;3.8686 2.86;3.8534 3.19;3.8257 2.87;3.7713 0.39;3.7658 0.37;3.7408 0.35;3.7236 0.39;3.6946 0.41;3.6901 0.44;3.6139 0.50;3.6009 0.57;3.5655 3.69;3.5596 7.65;3.5537 3.68;3.5269 0.74;3.5095 0.83;3.4837 1.00;3.4673 1.14;3.4479 1.33;3.4029 3.19;3.3743 6.16;3.3121 5148.85;3.2885 58.37;3.2715 8.09;3.2534 5.49;3.2284 4.06;3.2105 3.16;3.1748 0.37;2.8624 0.95;2.8325 1.66;2.8060 1.01;2.6952 0.56;2.6787 1.83;2.6741 3.46;2.6695 4.52;2.6649 3.37;2.6603 1.74;2.6277 0.54;2.5395 5.91;2.5227 18.48;2.5094 256.55;2.5050 482.43;2.5005 633.82;2.4960 435.65;2.4916 205.46;2.3364 1.51;2.3317 3.16;2.3272 4.18;2.3225 3.02;2.3179 1.43;2.1278 1.15;2.0948 2.38;2.0688 10.42;1.9078 0.32;1.8353 0.55;1.8047 1.09;1.7818 0.95;1.7727 0.92;1.7518 0.40;1.7445 0.38;1.5999 0.49;1.5800 1.01;1.5699 1.05;1.5486 1.04;1.5398 1.01;1.5191 0.45;1.2356 0.80;0.8904 0.61;0.0080 2.38;-0.0002 56.69;-0.0084 2.00
Example No. I-2 [DMSO-D_6] 9.9022 0.44;8.7772 0.50;8.6463 0.42;8.0130 16.00;7.7728 0.64;7.7581 0.33;7.7407 0.50;7.5929 0.52;7.3484 9.21;7.3313 4.39;7.3267 10.28;7.3088 3.30;7.2042 0.38;7.1754 7.08;7.1595 3.59;7.0421 3.74;7.0234 8.65;7.0126 11.26;7.0076 4.29;6.9955 3.95;6.9907 9.69;6.9573 0.62;6.9001 7.60;6.8876 4.10;5.7464 13.29;5.6954 2.45;5.6739 3.26;5.6688 2.96;5.6472 2.43;5.4524 1.52;5.4104 5.36;5.3688 5.44;5.3262 1.43;4.8008 14.95;4.7949 14.86;4.7407 0.94;4.3647 1.74;4.3317 1.80;4.0571 0.80;4.0392 2.27;4.0214 2.32;4.0037 1.21;3.9850 1.69;3.9517 1.80;3.8530 2.59;3.8260 2.95;3.8100 3.38;3.7831 2.88;3.5499 3.63;3.5440 7.26;3.5382 3.57;3.4766 0.33;3.4424 0.49;3.4165 1.72;3.4070 1.58;3.3895 5.58;3.3785 2.68;3.3685 4.75;3.3595 2.82;3.3469 4.70;3.3252 7.94;3.3047 416.16;3.2810 7.73;3.2426 1.41;3.0372 0.33;2.8752 1.34;2.8491 2.27;2.8170 1.23;2.6737 0.74;2.6693 1.21;2.6648 0.70;2.5390 1.68;2.5087 48.88;2.5045 86.78;2.5000 110.03;2.4957 76.72;2.3313 0.55;2.3268 0.72;2.3222 0.49;2.1375 1.59;2.1049 3.18;2.0691 2.49;1.9868 9.24;1.9080 0.66;1.8444 0.72;1.8229 1.38;1.8154 1.43;1.7920 1.34;1.7626 0.56;1.6213 0.60;1.6144 0.71;1.5938 1.36;1.5841 1.46;1.5630 1.36;1.5542 1.28;1.5340 0.60;1.2366 0.62;1.1927 2.59;1.1749 5.02;1.1571 2.49;-0.0002 5.18
Example No. I-3 [DMSO-D_6] 8.0183 1.38;7.3327 0.53;7.1725 0.58;7.0218 0.70;7.0082 0.35;6.9906 0.80;6.8999 0.59;6.8859 0.33;5.7441 7.03;5.4070 0.43;5.3656 0.46;4.8067 1.20;4.8008 1.20;4.3506 0.38;4.3380 0.69;4.3252 0.44;4.0903 0.34;4.0772 0.36;4.0572 1.22;4.0394 3.66;4.0216 3.70;4.0038 1.27;3.5397 0.39;3.5338 0.72;3.5281 0.38;3.4750 0.33;3.4622 0.37;3.4575 0.64;3.4448 0.70;3.4401

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0.74;3.4273 0.79;3.4226 0.61;3.4098 0.68;3.3964 1.04;3.3757 1.59;3.3299 662.84;3.3068 6.66;3.1773 1.22;3.1642 1.18;2.6708 0.41;2.5408 0.57;2.5240 1.51;2.5106 21.47;2.5063 40.33;2.5018 52.87;2.4974 36.58;2.4930 17.42;2.4636 0.33;2.4454 0.49;2.4280 0.46;2.3285 0.36;2.0685 0.90;1.9869 16.00;1.1930 4.40;1.1752 8.70;1.1574 4.29;1.0748 0.93;1.0572 1.77;1.0398 0.88;0.9521 1.12;0.9343 2.20;0.9165 1.07;-0.0002 0.67
Example No. I-5 [DMSO-D_6] 7.9681 16.00;7.4330 1.50;7.4160 1.98;7.4119 3.10;7.3952 3.13;7.3910 1.89;7.3739 1.51;7.3085 2.56;7.1750 5.80;7.1585 2.74;7.0418 2.83;7.0226 6.92;7.0121 4.36;6.9908 3.84;6.9093 3.01;6.9008 5.87;6.8865 5.33;6.8644 1.87;6.0740 1.94;6.0516 2.36;6.0436 2.19;6.0213 1.96;5.4545 1.14;5.4110 4.19;5.3690 4.16;5.3271 1.09;4.8870 0.53;4.8816 0.59;4.8472 6.66;4.8417 10.99;4.8361 6.08;4.8020 0.48;4.7962 0.58;4.3673 1.31;4.3338 1.42;3.9904 1.39;3.9536 1.47;3.8311 0.43;3.8095 1.58;3.7769 1.77;3.7681 2.13;3.7375 1.93;3.5278 3.35;3.5207 4.59;3.5148 8.43;3.5088 5.00;3.4848 3.01;3.4631 3.39;3.3942 7.50;3.3307 5101.71;3.3077 39.28;3.2505 2.33;3.2140 0.93;3.1513 0.33;2.8803 0.83;2.8505 1.57;2.8219 0.84;2.6753 1.19;2.6708 1.61;2.6661 1.17;2.6613 0.59;2.5407 2.04;2.5107 94.07;2.5063 176.46;2.5017 231.85;2.4973 160.85;2.4929 77.91;2.3331 1.24;2.3283 1.57;2.1548 1.15;2.1171 2.28;2.0796 1.44;2.0684 11.58;1.8497 0.53;1.8211 1.07;1.7995 1.06;1.6243 0.49;1.5944 1.06;1.5722 1.05;1.5414 0.42;1.2375 0.37;-0.0002 12.57
Example No. I-6 [DMSO-D_6] 7.9699 10.61;7.4071 2.41;7.3934 4.66;7.3796 3.07;7.2752 1.62;7.1866 3.78;7.1592 4.04;7.1538 4.69;7.1452 3.55;7.1404 4.18;7.1317 1.81;7.0981 1.82;7.0412 4.24;6.9510 1.99;6.9167 4.54;6.2241 1.96;6.2077 2.40;6.2036 2.22;6.1871 1.98;5.7656 16.00;5.4603 1.61;5.4319 3.45;5.3819 3.39;5.3536 1.59;4.8286 0.82;4.8247 0.79;4.8020 3.81;4.7981 3.85;4.7899 3.79;4.7861 3.61;4.7633 0.81;4.7594 0.80;4.3670 1.08;4.3451 1.11;4.0452 0.51;4.0334 1.53;4.0215 1.55;4.0097 0.53;3.9852 1.04;3.9628 1.11;3.7541 1.50;3.7334 1.91;3.7262 2.29;3.7056 1.88;3.5693 2.07;3.5530 2.10;3.5414 1.63;3.5251 1.59;3.4631 2.42;3.4592 4.73;3.4554 2.22;3.4198 0.46;3.4137 0.81;3.4074 0.57;3.4008 0.99;3.3946 1.65;3.3883 1.06;3.3754 1.57;3.3523 274.08;3.3299 1.08;3.2952 0.77;3.2912 0.87;3.2716 1.51;3.2523 0.85;3.2486 0.70;2.8618 0.76;2.8431 1.38;2.8236 0.77;2.6180 0.64;2.6151 0.84;2.6121 0.61;2.5428 0.39;2.5241 2.50;2.5211 3.45;2.5062 103.50;2.5033 133.72;2.5004 96.81;2.3904 0.69;2.3875 0.88;2.3846 0.64;2.1497 0.99;2.1296 1.16;2.1078 1.06;2.0877 1.09;2.0787 0.92;1.9906 6.59;1.8398 0.37;1.8207 0.88;1.8017 0.83;1.6093 0.33;1.6029 0.39;1.5892 0.87;1.5828 0.90;1.5688 0.88;1.5627 0.83;1.5490 0.35;1.1858 1.79;1.1740 3.53;1.1622 1.75;0.0051 0.44;-0.0002 8.35
Example No. I-8 [DMSO-D_6] 8.2694 0.37;8.0297 16.00;7.9423 0.34;7.3091 2.84;7.1813 6.20;7.1772 11.27;7.1662 10.80;7.1624 8.45;7.0958 2.91;7.0732 3.19;7.0426 3.23;7.0294 7.49;6.9051 6.34;6.8935 3.90;5.8645 2.29;5.8471 2.58;5.8369 2.65;5.8193 2.37;5.4555 1.50;5.4132 5.05;5.3703 4.97;5.3273 1.58;4.8808 13.15;4.8749 13.81;4.3601 1.47;4.3275 1.57;3.9771 1.37;3.9407 1.52;3.9294 2.96;3.9015 2.87;3.8861 3.23;3.8584 2.64;3.6039 2.94;3.5981 6.75;3.5921 3.20;3.4144 0.70;3.4048 1.16;3.3952 0.96;3.3853 1.40;3.3759 2.57;3.3666 1.96;3.3337 316.84;3.3303 523.70;3.3286 460.30;3.3252 593.19;3.2919 6.64;3.2742 4.45;3.2582 2.69;3.2487 4.11;3.2310 4.04;3.1993 0.56;3.1490 0.35;3.1246 0.33;2.8581 1.12;2.8268 1.93;2.7999 1.08;2.6796 0.53;2.6753 1.26;2.6707 1.76;2.6660 1.35;2.5409 1.12;2.5240 3.16;2.5106 90.30;2.5061 191.47;2.5015 264.57;2.4969 200.78;2.4925 103.79;2.3329 1.42;2.3283 1.93;2.3238 1.50;2.1244 1.34;2.0912 2.76;2.0736 13.65;2.0591 1.66;1.8417 0.52;1.8317 0.61;1.8123 1.21;1.8025 1.29;1.7812 1.18;1.7728 1.17;1.7501 0.51;1.6054 0.50;1.5955 0.62;1.5739 1.21;1.5645 1.36;1.5442 1.21;1.5343 1.19;1.5136 0.52;1.5038 0.44;1.2353 0.90;0.1460 0.45;0.0081 3.18;-0.0002 106.36;-0.0084 5.20;-0.1499 0.45
Example No. I-9 [DMSO-D_6] 9.7648 0.40;7.9977 5.78;7.9717 0.36;7.3105 1.24;7.2239 2.35;7.2028 2.50;7.1771 2.83;7.1657 1.46;7.0442 1.45;7.0299 3.16;6.9057 3.58;6.8943 1.72;6.7107 2.56;6.7047 2.70;6.5880 1.61;6.5824 1.35;6.5667 1.43;6.5612 1.25;5.8121 0.94;5.7933 1.12;5.7844 1.16;5.7656 1.11;5.4587 0.72;5.4144 2.49;5.3719 2.50;5.3292 0.88;4.8596 4.64;4.8539 4.69;4.3610 0.80;4.3280

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0.83;4.0557 0.50;4.0382 1.43;4.0203 1.50;4.0018 0.54;3.9815 0.81;3.9460 0.83;3.8409 0.48;3.8294 0.40;3.8150 0.97;3.7878 1.26;3.7721 1.29;3.7534 16.00;3.6856 1.58;3.5763 1.35;3.5708 2.96;3.4146 0.49;3.4061 0.72;3.3766 1.59;3.3657 1.55;3.3367 262.16;3.3302 692.11;3.2913 1.36;3.2802 1.61;3.2608 2.29;3.2369 1.33;3.2187 1.11;2.8610 0.54;2.8343 1.02;2.8008 0.58;2.7985 0.47;2.6712 1.05;2.5415 0.45;2.5018 180.11;2.3285 1.07;2.1308 0.74;2.0978 1.42;2.0732 1.60;2.0602 0.78;1.9885 5.87;1.8153 0.67;1.8089 0.69;1.7838 0.61;1.7769 0.59;1.5781 0.62;1.5699 0.66;1.5476 0.66;1.5404 0.57;1.3973 0.52;1.2589 0.38;1.2367 0.91;1.1923 1.51;1.1746 2.97;1.1568 1.53;0.8684 0.36;0.8490 0.45;0.8303 0.33;-0.0002 10.43
Example No. I-10 [DMSO-D_6] 8.8000 0.35;8.0314 16.00;8.0258 0.56;7.3002 1.37;7.2954 1.51;7.2887 1.57;7.2839 2.00;7.2810 1.63;7.2724 3.50;7.2647 1.91;7.2587 0.45;7.1955 0.88;7.1824 8.23;7.1755 8.85;7.1706 6.38;7.1683 4.98;7.1624 1.02;7.1294 2.47;7.0939 2.49;7.0390 6.09;6.9487 2.81;6.9145 5.99;5.9825 2.63;5.9702 2.96;5.9639 2.84;5.9516 2.64;5.4543 2.00;5.4259 4.37;5.3764 4.54;5.3480 2.07;4.8469 12.91;4.8429 12.80;4.3581 1.42;4.3361 1.43;4.0454 0.68;4.0335 1.99;4.0217 2.00;4.0099 0.69;3.9754 1.36;3.9469 3.25;3.9281 2.81;3.9181 2.98;3.8995 2.46;3.6563 3.62;3.6524 7.40;3.6484 3.44;3.4078 1.31;3.4019 1.98;3.3887 2.94;3.3825 4.59;3.3761 5.15;3.3509 1174.43;3.3311 6.48;3.3273 18.77;3.3192 3.56;3.3068 0.53;3.2844 1.13;3.2807 1.28;3.2611 2.01;3.2418 1.16;3.1708 0.76;3.1622 0.74;2.8500 1.05;2.8299 1.79;2.8120 1.06;2.6180 1.96;2.6150 2.59;2.6120 1.91;2.6091 0.99;2.5427 2.69;2.5242 8.11;2.5211 10.12;2.5179 11.89;2.5091 139.51;2.5062 280.13;2.5032 371.18;2.5002 269.11;2.4973 124.42;2.3933 0.95;2.3904 1.85;2.3874 2.43;2.3844 1.74;2.1262 1.29;2.1054 1.53;2.0868 1.43;2.0782 5.17;2.0671 1.39;1.9905 8.79;1.8320 0.51;1.8253 0.60;1.8114 1.17;1.8053 1.27;1.7905 1.21;1.7847 1.11;1.7707 0.52;1.7643 0.41;1.5910 0.47;1.5847 0.57;1.5708 1.17;1.5644 1.23;1.5504 1.20;1.5442 1.11;1.5301 0.49;1.5239 0.41;1.3969 3.62;1.2337 1.97;1.1860 2.41;1.1741 4.71;1.1623 2.36;0.8535 0.32;0.0966 0.33;0.0052 3.55;-0.0002 79.84;-0.0057 2.64

NMR Peak list method, further details

Further details of NMR-data description with peak lists you find in the publication „ Citation of NMR Peak-list Data within Patent Applications ":

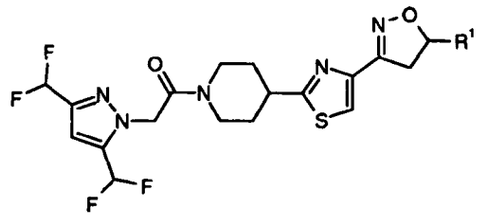
http://www.rdelectronic.co.uk/rd/free/RD564025.pdf

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Patent Claims

1. Combinations comprising:

(A) at least one thiazolylisoxazoline of formula (I)



(I)

in which

R^1 represents phenyl, which is at least substituted with one prop-2-yn-1-yloxy and optionally be additionally substituted by one, two or three substituents selected from the group consisting of methyl, methoxy, fluoro or chloro or an agrochemically acceptable salt thereof,

and

(B) at least one further active compound selected from the following groups

inhibitors of the ergosterol synthesis,
inhibitors of the respiratory chain at complex I or II,
inhibitors of the respiratory chain at complex III,
inhibitors of the mitosis and cell division,
compounds capable of having a multisite action,
compounds capable of inducing a host defense,
inhibitors of the amino acid and/or protein biosynthesis,
inhibitors of the ATP production,
inhibitors of the cell wall synthesis,
inhibitors of the lipid and membrane synthesis,
inhibitors of the melanine biosynthesis,
inhibitors of the nucleic acid synthesis,
inhibitors of the signal transduction,
compounds capable of acting as uncoupler,
other fungicides.

2. Combinations according to claim 1 comprising at least one compound of the formula (I) selected from the group consisting of

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(I-1) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-2) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[4-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-3) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[3-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-4) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2,6-difluoro-4-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-5) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-fluoro-6-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-6) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-chloro-6-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-7) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2,6-difluoro-3-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-8) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[5-fluoro-2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-9) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[4-methoxy-2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,

(I-10) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[3-fluoro-2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone,.

3. Combinations according to claim 1 comprising at least one further active compound (B) selected from the following groups:

(2.1) bixafen, (2.2) boscalid, (2.6) fluopyram, (2.8) fluxapyroxad, (2.11) isopyrazam (mixture of syn-epimeric racemate 1RS,4SR,9RS and anti-epimeric racemate 1RS,4SR,9SR), (2.12) isopyrazam (anti-epimeric racemate 1RS,4SR,9SR), (2.13) isopyrazam (anti-epimeric enantiomer 1R,4S,9S), (2.14) isopyrazam (anti-epimeric enantiomer 1S,4R,9R), (2.15) isopyrazam (syn epimeric racemate

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1RS,4SR,9RS), (2.16) isopyrazam (syn-epimeric enantiomer 1R,4S,9R), (2.17) isopyrazam (syn-epimeric enantiomer 1S,4R,9S), (2.27) N-[1-(2,4-dichlorophenyl)-1-methoxypropan-2-yl]-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide, (2.29) N-[9-(dichloromethylene)-1,2,3,4-tetrahydro-1,4-methanonaphthalen-5-yl]-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide, (3.1) ametoctradin, (3.2) amisulbrom, (3.3) azoxystrobin, (3.4) cyazofamid, (3.9) famoxadone, (3.10) fenamidone, (3.12) fluoxastrobin, (3.16) picoxystrobin, (3.17) pyraclostrobin, (3.22) trifloxystrobin, (4.6) fluopicolide, (5.1) bordeaux mixture, (5.4) chlorothalonil, (5.5) copper hydroxide, (5.7) copper oxide, (5.8) copper oxychloride, (5.9) copper(2+) sulfate, (5.16) folpet, (5.23) mancozeb, (5.25) metiram, (5.26) metiram zinc, (5.29) propineb, (5.30) sulphur and sulphur preparations including calcium polysulphide, (7.7) pyrimethanil, (9.2) dimethomorph, (9.4) iprovalicarb, (9.5) mandipropamid, (10.9) propamocarb, (10.10) propamocarb hydrochloride, (12.9) metalaxyl, (12.10) metalaxyl-M (mefenoxam), (14.4) fluazinam, (15.9) cymoxanil, (15.24) fosetyl-aluminium, (15.25) fosetyl-calcium, (15.26) fosetyl-sodium, (15.41) phosphorous acid and its salts, (15.42) propamocarb-fosetylate, (15.54) 1-(4-{4-[(5R)-5-(2,6-difluorophenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)-2-[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]ethanone, (15.55) 1-(4-{4-[(5S)-5-(2,6-difluorophenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)-2-[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]ethanone, (15.56) 1-(4-{4-[5-(2,6-difluorophenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)-2-[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]ethanone, (15.60) 2,6-dimethyl-1H,5H-[1,4]dithiino[2,3-c:5,6-c']dipyrrole-1,3,5,7(2H,6H)-tetrone, (15.90) pentyl {6-[({[(1-methyl-1H-tetrazol-5-yl)(phenyl)methylidene]amino}oxy)methyl]pyridin-2-yl}carbamate.

4. Combination according to claims 1 to 3 comprising mixing partners (A):(B) in a weight ratio of 1:100 to 100:1.

5. Compositions comprising active compound combinations according to Claim 1, 2, 3 or 4 and further comprising auxiliaries, solvents, carriers, surfactant or extenders.

6. Method for controlling phytopathogenic fungi in crop protection, characterized in that active compound combinations according to Claim 1, 2, 3 or 4 or compositions according to Claim 5 are applied to the seed, the plant, to fruits of plants or to the soil on which the plant grows or is supposed to grow.

7. Method according to Claim 06, characterized in that the plant, the fruits of plants or the soil on which the plant grows or is intended to grow are treated.

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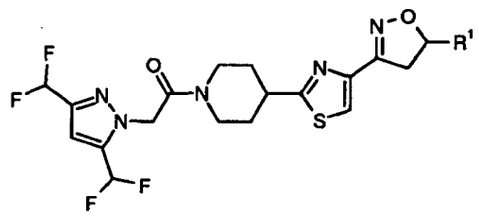
8. Method according to Claim 06, characterized in that in the treatment of leaves from 0.1 to 10 000 g/ha and in the treatment of seed from 2 to 200 g per 100 kg of seed are employed.

9. Use of active compound combinations according to Claim 1, 2, 3 or 4 or of compositions according to Claim 5 for controlling unwanted phytopathogenic fungi in crop protection.

10. Use of active compound combinations according to Claim or of compositions according to Claim 5 for treating seed, seed of transgenic plants and transgenic plants.

11. Seed treated with active compound combinations according to Claim 1, 2, 3 or 4 or with compositions according to Claim 5.

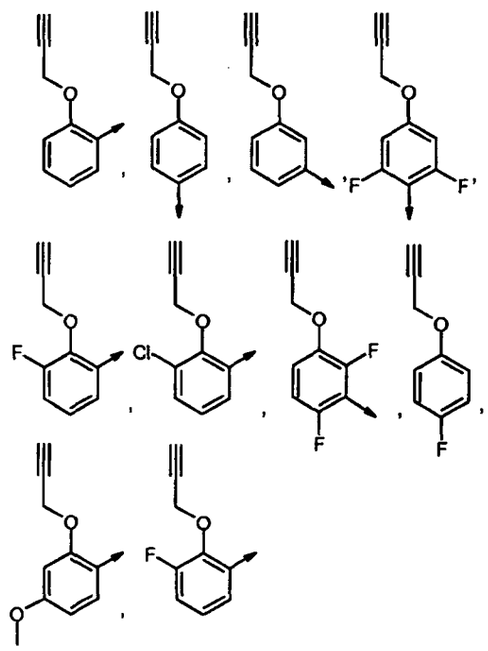
12. Thiazolylisoxazoline of formula (I)



(I)

in which

R^1 is



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Active compound combinations

Abstract

The present invention relates to active compound combinations, in particular within a fungicide composition, which comprises (A) a thiazolylisoxazoline of formula (I) and a further fungicidally active compound (B). Moreover, the invention relates to a method for curatively or preventively controlling the phytopathogenic fungi of plants or crops, to the use of a combination according to the invention for the treatment of seed, to a method for protecting a seed and not at least to the treated seed.

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PATENT COOPERATION TREATY PCT/EP2012/060508

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION CONCERNING SUBMISSION, OBTENTION OR TRANSMITTAL OF PRIORITY DOCUMENT

(PCT Administrative Instructions, Section 411)

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ALLEMAGNE

Date of mailing *(day/month/year)* 11 July 2012 (11.07.2012)	
Applicant's or agent's file reference BCS11-3034WO	**IMPORTANT NOTIFICATION**
International application No. PCT/EP2012/060508	International filing date *(day/month/year)* 04 June 2012 (04.06.2012)
International publication date *(day/month/year)* **Not yet published**	Priority date *(day/month/year)* 07 June 2011 (07.06.2011)
Applicant BAYER INTELLECTUAL PROPERTY GMBH et al	

The applicant is hereby notified of the date of receipt (or of obtaining by the International Bureau) of the priority document(s) relating to all earlier application(s) whose priority is claimed. Unless otherwise indicated by the letters "NR", in the right-hand column or by an asterisk appearing next to the date of receipt, **the priority document concerned was submitted or transmitted to or obtained by the International Bureau in compliance with Rule 17.1(a), (b) or (b-*bis*)**. This Form replaces any previously issued notification concerning submission, transmittal or obtaining of priority documents.

Priority date	Priority application No.	Country or regional Office or PCT receiving Office	Date of receipt of priority document
07 June 2011 (07.06.2011)	11168904.8	EP	09 July 2012 (09.07.2012)
07 June 2011 (07.06.2011)	61/494,105	US	25 June 2012 (25.06.2012)

The letters "NR" denote a priority document which, on the date of mailing of this Form, had not yet been received or obtained by the International Bureau in compliance with Rule 17.1(a), (b) or (b-*bis*). Where the applicant has failed to either submit, request to prepare and transmit, or to request the International Bureau to obtain the priority document within the applicable time limit under that Rule, the attention of the applicant is directed to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.

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CONSIGNACION	BANCO DE BOGOTA	062754387	599240972	28/11/2013	8.873.000.00

*** Conceptos Pagados ***

CANT.	RENTISTICO	CONCEPTO	Vr.UNDITARIO	Vr.CONCEPTO
1	50005-01-01 SOLICITUDES	1 TRAMITES DE SOL. DE PATENTE DE INVENCION	500.000.00	500.000.00
				$500.000.00

SON: **QUINIENTOS MIL PESOS MONEDA CORRIENTE***

Responsable: _____

Recibo de Caja Aplicado al Expediente No. _____

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

No. 13-283336- -00000-0000

Fecha: 2013-12-03 14:15:50 Dep. 2020 DIR.NUEVASCR
Tra. 11 PATENTEIYII Eve: 378 FASENACIONALI
Act. 411 PRESENTACION Folios: 372

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SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
NIT : 800.176.089-2
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Bogotá D.C., Diciembre 03 de 2013 - 13:52:03

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RECIBO DE CA	999999999	123476	02/12/2013		30.000.00
RECIBO DE CA	999999999	123477	02/12/2013		30.000.00

*** Conceptos Pagados ***

CANT.	RENTISTICO	CONCEPTO	Vr.UNDITARIO	Vr.CONCEPTO
2	50005-01-01 SOLICITUDES	1607 REIVINDICACION PATENTE UNITARIA ADICIONAL A LAS 10 INIC	30.000.00	60.000.00
				$60.000.00

ON: **SESENTA MIL PESOS MONEDA CORRIENTE*

Responsable: _____
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No. 13-283336- -00000-0000

Fecha: 2013-12-03 14:15:50 Dep: 2020 DIR.NUEVASCR
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PATENTE DE INVENCIÓN ☐ MODELO DE UTILIDAD ☐ Art 33 Decisión 486/00

- ☐ Indicación que se solicita una patente.
- ☐ Datos de identificación del solicitante o de la persona que presenta la solicitud
- ☐ Descripción de la invención
- ☐ Dibujos de ser estos pertinentes
- ☐ Comprobante de pago de las tasas establecidas (De ser el caso formato de descuento)

Completa ☐ Incompleta ☐

PATENTE DE INVENCIÓN PCT ☒ MODELO DE UTILIDAD PCT ☐ Art.33 Decisión 486/00, Circular Única

- ☒ Indicación que se solicita una PCT
- ☒ Copia de la solicitud en español, tal como fue presentada inicialmente (capítulo descriptivo, reivindicatorio, resumen)
- ☐ Dibujos de ser estos pertinentes
- ☒ Comprobante de pago de las tasas establecidas (de ser el caso formato de descuento)

Completa ☒ Incompleta ☐

DISEÑO INDUSTRIAL ☐ (Art. 119 Decisión 486/00)

- ☐ Indicación que se solicita Diseño industrial
- ☐ Datos de identificación del solicitante o de la persona que presenta la solicitud
- ☐ Representación gráfica y fotográfica del Diseño industrial o muestra del material que incorpora el diseño
- ☐ Comprobante de pago de las tasas establecidas

Completa ☐ Incompleta ☐

ESQUEMA DE TRAZADO ☐ (Art. 92 Decisión 486/00)

- ☐ Indicación que se solicita un esquema de trazado
- ☐ Datos de identificación del solicitante o de la persona que presenta la solicitud
- ☐ Representación gráfica de un esquema de trazado
- ☐ Comprobante de pago de las tasas establecidas

Completa ☐ Incompleta ☐