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SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

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SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO



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Solicitud de Patente de Invención titulada: "Insecticidas selectivos basados en cetoenoles cíclicos sustituidos y agentes destoxificantes"

Solicitante: Bayer CropScience AG

RESPUESTA AL AUTO NOTIFICADO POR FIJACIÓN EN LISTA NO. 193

DEL 20 DE MAYO DE 2011, OFICIO NO. 08295 (EXAMEN DE FONDO)

ÁLVARO CORREA ORDÓÑEZ, mayor de edad y vecino de Bogotá D.C., identificado tal como aparece al pie de mi firma, en mi carácter de apoderado de la sociedad en referencia, doy respuesta al auto emanado por ese Despacho dentro del término legal:

1. Objeciones del Examinador

1.1. Reivindicaciones relativas a uso o segundo uso.

Establece su Despacho que las reivindicaciones 1 a 8 no son patentables

porque se refieren a usos los cuales no se consideran materia patentable de acuerdo con la legislación colombiana.

1.2. Reivindicaciones

Se considera por parte de su Despacho que el procedimiento presentado en la reivindicación 9 no presenta características técnicas por medio de las cuales pueda ser diferenciado de una aplicación convencional.

En cuanto al agente de la reivindicación 10 se hace necesario especificar los compuestos que se encuentran presentes y por lo tanto se deben establecer las combinaciones específicas entre los compuestos (I-1') y los compuestos que mejoran la tolerabilidad.

1.3. Descripción

Considera su Despacho que en la descripción no se encuentran ensayos representativos para establecer la actividad de todas las composiciones que se encuentran en el capítulo descriptivo sino de algunas específicas.

1.4. Unidad de invención

El Examinador plantea que no habría unidad de invención por cuanto en las combinaciones de los compuestos I-1' con al menos un compuesto que mejora la tolerabilidad, no es posible establecer el número de compuestos que se están combinando y por lo tanto saber si dichas combinaciones son binarias, secundarias, terciarias, etc.

2. Argumentos a favor de la patentabilidad de la solicitud

2.1. Reivindicaciones relativas a uso y reivindicaciones 9 y 10.

En relación con la objeción a las reivindicaciones el solicitante ha decidido modificar el capítulo reivindicatorio limitándolo de manera notoria. En este nuevo capítulo reivindicatorio las reivindicaciones 1 a 8 y 10 han desaparecido. En cuanto a la reivindicación 9 se debe considerar el hecho de que, claramente, como lo establece su Despacho, dichas combinaciones específicas han demostrado actividad y por lo tanto su acción es novedosa e inventiva y lo mismo ocurre con el procedimiento para combatir insectos, es decir, dicho procedimiento es novedoso e inventivo en cuanto que aplica un producto novedoso e inventivo.

2.2. Descripción y Unidad de invención

Teniendo en cuenta las modificaciones hechas en el capítulo reivindicatorio debe ser claro que la descripción suministra el sustento suficiente para las combinaciones que se reivindican. De otro lado también debe ser claro que dichas modificaciones hacen clara la unidad de invención de la presente solicitud.

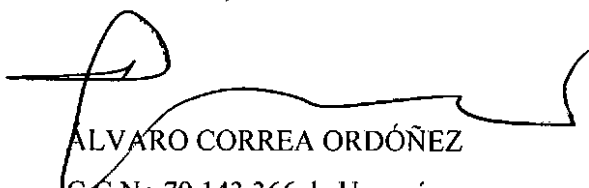
Hago notar que el compuesto II-e-5 aparece en los ejemplos de las tablas A, B y C.

3. Solicitudes concedidas en otros países para esta misma invención.

A manera informativa, pongo en conocimiento del Examinador que las patentes australiana 2005263570, euroasiática 12504, indonesia 27868, mexicana 282271, filipina 1-2007-500193, pakistaní 140933, rusa 12504 y surafricana 2007/00498 equivalentes a la presente solicitud colombiana han sido otorgadas. Aún cuando entiendo que estas decisiones de ninguna manera obligan al Despacho para decidir de igual forma, considero que por tratarse de una pregunta fáctica la determinación de la existencia de novedad, nivel inventivo y aplicación industrial, las decisiones de otras oficinas de patentes constituyen un antecedente persuasivo en la materia.

En virtud de lo anterior, solicito que se acepten las razones expuestas en el presente documento y en consecuencia, se otorgue el privilegio de patente de invención para el invento que se tramita en este expediente.

Atentamente,



ALVARO CORREA ORDÓÑEZ

C.C.No.79.143.366 de Usaquén

T.P.20.281

anexos. capitulo reivindicatorio modificado
copia patente australiana
copia patente euroasiatica

REIVINDICACIONES

1. Agente que presenta un contenido eficaz de una combinación de principios activos que comprende alguna de las siguientes combinaciones:

compuesto I-1'-1+mefenpir-dietil; I-1-5+isoxadifen-etil; I-1'-5+isoxadifen-dietil; I-1-5+cloquintocet-mexil; I-1'-5+diclormid; I-1'-5+isoxadifen-etil; I-1'-5+diclormid; I-1'-5+fencloirim; I-1'-5+mefenpir-dietil; I-1'-5+cloquintocet; I-1'-5+furilazol and I-1'-5+II-e-5.

2. Procedimiento para combatir insectos y/o acaricidas, caracterizados porque los agentes definidos en la reivindicación 1 se dejan actuar sobre insectos y/o arácnidos y/o su biotopo.

(11) Application No. AU 2005263570 B2

(19) AUSTRALIAN PATENT OFFICE

(54) Title

Selective insecticides based on substituted, cyclic keto-enols and safeners

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 20060101AFI2006042 20060101ALI2006042
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(56) Related Art

wo2004/065366 seen as AU 2004205350
 wo2005/048710 seen as AU 2004290516
 wo2005/044796 seen as AU 2004287596
 wo2004/111042 seen as AU 2004247370
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CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES,
FI, GB, GD, GR, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,
KG, KM, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA,
MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ,
OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL,
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(DE); ARNOLD, Christen (DE/DE); Pastor-Löh-Str. 42,
40764 Langenfeld (DE).

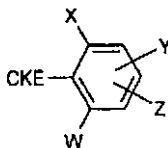
Veröffentlicht:

mit internationalen Recherchenberichten

Zur Erklärung der Zweibuchstaben-Codes und der anderen Ab-
kürzungen wird auf die Erklärungen ("Guidance Notes on
Codes and Abbreviations") am Anfang jeder regulären Ausgabe der
PCT-Gazette verwiesen.

(54) Title: SELECTIVE INSECTICIDES BASED ON SUBSTITUTED, CYCLIC KETO-ENOLS AND SAFENERS

(54) Bezeichnung: SELEKTIVE INSEKTIZIDE AUF BASIS VON SUBSTITUIERTEN, CYCLISCHEN KETOENOLEN UND
SAFENERN



(I)

(57) Abstract: The invention relates to the use of selective insecticides
for controlling insects and/or arachnids. Said insecticides are character-
ized by an active moiety of an active substance combination comprising
(a) at least one compound of formula (I), wherein CKE, W, X, Y, and Z
have the meaning indicated in the description, and (b) at least one com-
pound which improves crop plant tolerance and is part of the group of
compounds indicated in the description. Also disclosed is a method for
controlling insects and/or arachnids using the inventive insecticides.

(57) Zusammenfassung: Die vorliegende Erfindung betrifft die Verwendung selektiv-insektizider Mittel, gekennzeichnet durch
einen wirksamen Gehalt an einer Wirkstoffkombination umfassend (a) mindestens eine Verbindung der Formel (I) in welcher CKE,
W, X, Y und Z, die in der Beschreibung angegebene Bedeutung haben, und (b) zumindest eine die Kulturpflanzen-Verträglichkeit ver-
bessernde Verbindung aus der in der Beschreibung angegebenen Gruppe von Verbindungen, zur Bekämpfung von Insekten und/oder
Spinnentieren, sowie ein Verfahren zur Bekämpfung von Insekten und/oder Spinnentieren unter Einsatz der Mittel.

WO 2006/008111 AI

Selective insecticides based on substituted, cyclic keto-enols and safeners

The invention relates to the use of selective insecticidally and/or acaricidally active compound combinations which comprise substituted cyclic ketoenols, on the one
5 hand, and at least one compound which improves crop plant compatibility, on the other, for the selective control of insects and/or spider mites in various crops of useful plants.

Pharmaceutical properties of 3-arylpyrrolidine-2,4-diones have already been
10 described (S. Suzuki et al. Chem. Pharm. Bull. 15 1120 (1967)). Furthermore, N-phenylpyrrolidine-2,4-diones were synthesized by R. Schmierer and H. Mildenberger (Liebigs Ann. Chem. 1985, 1095). A biological activity of these compounds has not been described.

15 EP-A-0 262 399 and GB-A-2 266 888 disclose compounds of a similar structure (3-arylpyrrolidine-2,4-diones) of which, however, no herbicidal, insecticidal or acaricidal action has been disclosed. Unsubstituted bicyclic 3-arylpyrrolidine-2,4-dione derivatives (EP-A-355 599, EP-A-415 211 and JP 12-053 670) and substituted monocyclic 3-arylpyrrolidine-2,4-dione derivatives (EP-A-377 893 and
20 EP-A-442 077) having herbicidal, insecticidal or acaricidal action have been disclosed.

There have also been disclosed polycyclic 3-arylpyrrolidine-2,4-dione derivatives (EP-A-442 073) and 1H-arylpyrrolidinedione derivatives (EP-A-456 063,
25 EP-A-521 334, EP-A-596 298, EP-A-613 884, EP-A-613 885, WO 94/01 997, WO 95/26 954, WO 95/20 572, EP-A-0 668 267, WO 96/25 395, WO 96/35 664, WO 97/01 535, WO 97/02 243, WO 97/36 868, WO 97/43275, WO 98/05638, WO 98/06721, WO 98/25928, WO 99/16748, WO 99/24437, WO 99/43649, WO 99/48869 und WO 99/55673, WO 01/17972, WO 01/23354, WO 01/74770,
30 WO 03/062244, WO 04/007448, WO 04/024688, WO 04/080962, WO 04/065366, WO 04/111042, DE-A-10351646, DE-A-10354628, DE-A-10354629, DE-A-10351647).

It is known that certain substituted Δ^3 -dihydrofuran-2-one derivatives have herbicidal
35 properties (cf. DE-A-4 014 420). The synthesis of the tetronic acid derivatives used as starting materials (such as, for example, 3-(2-methylphenyl)-4-hydroxy-5-(4-fluorophenyl)- Δ^3 -dihydrofuran-2-one) is also described in DE-A-4 014 420. Compounds of a similar structure known from the publication Campbell et al.,

J. Chem. Soc., Perkin Trans. 1, 1985, (8) 1567-76, but no insecticidal and/or acaricidal activity is mentioned. 3-Aryl- Δ^3 -dihydrofuranone derivatives having herbicidal, acaricidal and insecticidal properties are also known from EP-A-528 156, EP-A-0 647 637, WO 95/26 345, WO 96/20 196, WO 96/25 395, WO 96/35 664, 5 WO 97/01 535, WO 97/02 243, WO 97/36 868, WO 98/05638, WO 98/25928, WO 99/16748, WO 99/43649, WO 99/48869, WO 99/55673, WO 01/23354, WO 01/74770, WO 03/062244, WO 04/024688 and WO 04/080962. 3-Aryl- Δ^3 -dihydrothiophenone derivatives are likewise known (WO 95/26 345, 96/25 395, WO 97/01 535, WO 97/02 243, WO 97/36 868, WO 98/05638, WO 98/25928, WO 10 99/16748, WO 99/43649, WO 99/48869, WO 99/55673, WO 01/17972, WO 01/23354, WO 01/74770, WO 03/062244, WO 04/080962, WO 04/111042).

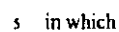
Certain phenylpyrone derivatives which are unsubstituted in the phenyl ring are already known (cf. A.M. Chirazi, T. Kappe and E. Ziegler, Arch. Pharm. 309, 558 15 (1976) and K.-H. Boltze and K. Heidenbluth, Chem. Ber. 91, 2849), but a possible use of these compounds as pesticides has not been mentioned. Phenylpyrone derivatives which are substituted in the phenyl ring and have herbicidal, acaricidal and insecticidal properties are described in EP-A-588 137, WO 96/25 395, WO 96/35 664, WO 97/01 535, WO 97/02 243, WO 97/16 436, WO 97/19 941, 20 WO 97/36 868, WO 98/05638, WO 99/43649, WO 99/48869, WO 99/55673, WO 01/17972, WO 01/74770, WO 03/062244, WO 04/080962, WO 04/111042.

Certain 5-phenyl-1,3-thiazine derivatives which are unsubstituted in the phenyl ring are already known (cf. E. Ziegler and E. Steiner, Monatsh. 95, 147 (1964), 25 R. Ketcham, T. Kappe and E. Ziegler, J. Heterocycl. Chem. 10, 223 (1973)), but a possible use of these compounds as pesticides has not been mentioned. 5-Phenyl-1,3-thiazine derivatives which are substituted in the phenyl ring and have herbicidal, acaricidal and insecticidal action are described in WO 94/14 785, WO 96/02 539, WO 96/35 664, WO 97/01 535, WO 97/02 243, WO 97/02 243, WO 97/36 868, 30 WO 99/05638, WO 99/43649, WO 99/48869, WO 99/55673, WO 01/17972, WO 01/74770, WO 03/062244, WO 04/080962, WO 04/111042.

It is known that certain substituted 2-arylcyclopentanediones have herbicidal, insecticidal and acaricidal properties (cf., for example, US-4 283 348; 4 338 122; 35 4 436 666; 4 526 723; 4 551 547; 4 632 698; WO 96/01 798; WO 96/03 366, WO 97/14 667 and also WO 98/39281, WO 99/43649, WO 99/48869, WO 99/55673, WO 01/17972, WO 01/74770, WO 03/062244, WO 04/080962, WO 04/111042). Moreover, compounds having similar substitutions are known;

- 3-hydroxy-5,5-dimethyl-2-phenylcyclopent-2-en-1-one from the publication Micklefield et al., *Tetrahedron*, (1992), 7519-26, and the natural product involutin (-)-cis-5-(3,4-dihydroxyphenyl)-3,4-dihydroxy-2-(4-hydroxyphenyl)cyclopent-2-en one from the publication Edwards et al., *J. Chem. Soc. S*, (1967), 405-9. An
- 5 insecticidal or acaricidal action is not described. Moreover, 2-(2,4,6-trimethylphenyl)-1,3-indanedione is known from the publication *J. Economic Entomology*, 66, (1973), 584 and the *Offenlegungsschrift* (German Published Specification) DE-A 2 361 084, with herbicidal and acaricidal actions being mentioned.
- 10 It is known that certain substituted 2-arylcylohexanediones have herbicidal, insecticidal and acaricidal properties (US-4 175 135, 4 209 432, 4 256 657, 4 256 658, 4 256 659, 4 257 858, 4 283 348, 4 303 669, 4 351 666, 4 409 153, 4 436 666, 4 526 723, 4 613 617, 4 659 372, DE-A 2 813 341, and also
- 15 Wheeler, T.N., *J. Org. Chem.* 44, 4906 (1979), WO 99/43649, WO 99/48869, WO 99/55673, WO 01/17972, WO 01/74770, WO 03/062244, WO 04/080962, WO 04/111042).
- It is known that certain substituted 4-arylpyrazolidine-3,5-diones have acaricidal,
- 20 insecticidal and herbicidal properties (cf., for example, WO 92/16 510, EP-A-508 126, WO 96/11 574, WO 96/21 652, WO 99/47525, WO 01/17 351, WO 01/17 352, WO 01/17 353, WO 01/17 972, WO 01/17 973, WO 03/028466, WO 03/062244, WO 03/062244, WO 04/080962).
- 25 Moreover, selective herbicides based on substituted cyclic ketoenols and safeners have been described (WO 03/013249).
- However, the compatibility of these compounds in particular with monocotyledonous crop plants is not under all conditions entirely satisfactory.
- 30 Surprisingly, it has now been found that certain substituted cyclic ketoenols, when used together with the crop plant compatibility-improving compounds (safeners/antidotes) described below, prevent damage to the crop plants extremely efficiently and can be used particularly advantageously as broadband combination
- 35 preparations for the selective control of insects even in crops of monocotyledonous useful plants, such as, for example, in cereals, but also in maize, millet and rice.

(a) at least one substituted cyclic ketoenol of the formula (I)



Z represents hydrogen, alkyl, halogen, alkenyl, alkynyl, represents in each case
10 optionally substituted aryl or hetaryl,

CKE represents one of the groups



in which

5 A represents hydrogen, in each case optionally halogen-substituted alkyl, alkenyl, alkoxyalkyl, alkylthioalkyl, saturated or unsaturated, optionally substituted cycloalkyl, in which optionally at least one ring atom is replaced by a heteroatom, or in each case optionally halogen-, alkyl-, haloalkyl-, alkoxy-, haloalkoxy-, cyano- or nitro-substituted aryl, arylalkyl or hetaryl,

10 B represents hydrogen, alkyl or alkoxyalkyl, or

A and B together with the carbon atom to which they are attached represent a saturated or unsaturated, unsubstituted or substituted cycle which optionally contains at least one heteroatom,

15

D represents hydrogen or an optionally substituted radical from the group consisting of alkyl, alkenyl, alkynyl, alkoxyalkyl, saturated or unsaturated cycloalkyl, in which optionally one or more ring members are replaced by heteroatoms, arylalkyl, aryl, hetarylalkyl or hetaryl, or

20

A and D together with the atoms to which they are attached represent a saturated or unsaturated cycle which is unsubstituted or substituted in the A,D moiety and optionally contains at least one heteroatom, or

25

A and Q¹ together represent alkanediyl or alkenediyl which are in each case optionally substituted by hydroxyl or by in each case optionally substituted alkyl, alkoxy, alkylthio, cycloalkyl, benzyloxy or aryl, or

30

Q¹ represents hydrogen or alkyl,

Q², Q⁴, Q⁵ and Q⁶ independently of one another represent hydrogen or alkyl,

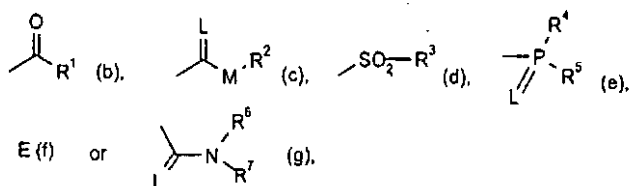
35

Q³ represents hydrogen, alkyl, alkoxyalkyl, alkylthioalkyl, optionally substituted cycloalkyl (in which optionally one methylene group is replaced by oxygen or sulphur) or optionally substituted phenyl, or

Q³ and Q⁴ together with the carbon atom to which they are attached, represent a saturated or unsaturated, unsubstituted or substituted cycle which

optionally contains a heteroatom,

G represents hydrogen (a) or represents one of the groups



in which

E represents a metal ion equivalent or an ammonium ion,

L represents oxygen or sulphur,

M represents oxygen or sulphur,

R¹ represents in each case optionally halogen-substituted alkyl, alkenyl, alkoxyalkyl, alkylthioalkyl, polyalkoxyalkyl or optionally halogen-, alkyl- or alkoxy-substituted cycloalkyl, which may be interrupted by at least one heteroatom, represents in each case optionally substituted phenyl, phenylalkyl, hetaryl, phenoxyalkyl or hetarylalkyl,

R² represents in each case optionally halogen-substituted alkyl, alkenyl, alkoxyalkyl, polyalkoxyalkyl or represents in each case optionally substituted cycloalkyl, phenyl or benzyl,

R³, R⁴ and R⁵ independently of one another represent in each case optionally halogen-substituted alkyl, alkoxy, alkylamino, dialkylamino, alkylthio, alkenylthio, cycloalkylthio and represent in each case optionally substituted phenyl, benzyl, phenoxy or phenylthio,

R⁶ and R⁷ independently of one another represent hydrogen, in each case optionally halogen-substituted alkyl, cycloalkyl, alkenyl,

-7-

- including all possible tautomeric forms of the compounds of the general formula (I) and the possible salts or acid or base adducts of the compounds of the general formula (I) -

and

10

4-dichloroacetyl-1-oxa-4-aza-spiro [4.5]-decane (AD-67, MON-4660), 1-dichloroacetyl-hexahydro-3,3,8a-trimethylpyrrolo[1,2-a]-pyrimidin-6(2H)-one (dicyclonon, BAS-145138), 4-dichloroacetyl-3,4-dihydro-3-methyl-2H-1,4-benzoxazine (benoxacor), 1-methyl-hexyl 5-chloro-quinolin-8-oxo-acetate (cloquintocet-mexyl), 3-(2-chloro-benzyl)

15 1-(1-methyl-1-phenyl-ethyl)-urea (cumyluron), α -(cyanomethoximino)-phenylacetone nitrile (cyometrinil), 2,4-dichloro-phenoxyacetic acid (2,4-D), 4-(2,4-dichloro-phenoxy)-butyric acid (2,4-DB), 1-(1-methyl-1-phenyl-ethyl)-3-(4-methyl-phenyl)-urea (daimuron, dymron), 3,6-dichloro-2-methoxy-benzoic acid (dicamba), S-1-methyl-1-phenyl-ethyl piperidine-1-thiocarboxylate (dimepiperate), 2,2-dichloro-N-(2-oxo-2-(2-propenylamino)-ethyl)-N-(2-propenyl)-acetamide (DKA-24), 2,2-dichloro-N,N-di-2-propenyl-acetamide (dichlormid),

20 4,6-dichloro-2-phenyl-pyrimidine (fenclorim), ethyl 1-(2,4-dichloro-phenyl)-5-trichloromethyl-1H-1,2,4-triazole-3-carboxylate (fenchlorazole-ethyl), phenyl-methyl 2-chloro-4-trifluoromethyl-thiazole-5-carboxylate (flurazole), 4-chloro-N-(1,3-dioxolan-2-yl)-methoxy)- α -trifluoro-acetophenone oxime (fluxofenim), 3-dichloroacetyl-5-(2-furanyl)-

25 2,2-dimethyl-oxazolidine (furilazole, MON-13900), ethyl 4,5-dihydro-5,5-diphenyl-3-isoxazolecarboxylate (isoxadifen-ethyl), 1-(ethoxycarbonyl)-ethyl 3,6-dichloro-2-methoxybenzoate (lactidichlor), (4-chloro-o-tolyl-oxy)-acetic acid (MCPA), 2-(4-chloro-o-tolyl-oxy)-propionic acid (mecoprop), diethyl 1-(2,4-dichloro-phenyl)-4,5-dihydro-5-methyl-1H-pyrazole-3,5-dicarboxylate (mefenpyr-diethyl), 2-dichloromethyl-2-methyl-

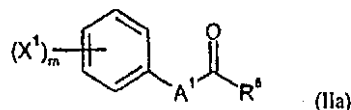
30 1,3-dioxolane (MG-191), 2-propenyl-1-oxa-4-azaspiro[4.5]decane 4-carbodiithioate (MG-838), 1,8-naphthalic anhydride, α -(1,3-dioxolan-2-yl)-methoximino)-phenylacetone nitrile

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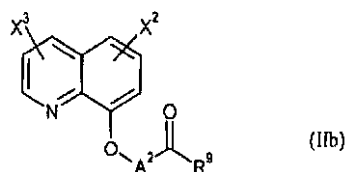
(oxabetrinil), 2,2-dichloro-N-(1,3-dioxolan-2-yl-methyl)-N-(2-propenyl)-acetamide (PPG-1292), 3-dichloroacetyl-2,2-dimethyl-oxazolidine (R-28725), 3-dichloroacetyl-2,2,5-trimethyl-oxazolidine (R-29148), 4-(4-chloro-o-tolyl)-butyric acid, 4-(4-chloro-phenoxy)-butyric acid, diphenylmethoxyacetic acid, methyl diphenylmethoxyacetate, ethyl diphenylmethoxyacetate, methyl 1-(2-chloro-phenyl)-5-phenyl-1H-pyrazole-3-carboxylate, ethyl 1-(2,4-dichloro-phenyl)-5-methyl-1H-pyrazole-3-carboxylate, ethyl 1-(2,4-dichloro-phenyl)-5-isopropyl-1H-pyrazole-3-carboxylate, ethyl 1-(2,4-dichloro-phenyl)-5-(1,1-dimethyl-ethyl)-1H-pyrazole-3-carboxylate, ethyl 1-(2,4-dichloro-phenyl)-5-phenyl-1H-pyrazole-3-carboxylate, ethyl 5-(2,4-dichloro-benzyl)-2-isoxazoline-3-carboxylate, ethyl 5-phenyl-2-isoxazoline-3-carboxylate, ethyl 5-(4-fluoro-phenyl)-5-phenyl-2-isoxazoline-3-carboxylate, 1,3-dimethyl-but-1-yl 5-chloro-quinolin-8-oxy-acetate, 4-allyloxy-butyl 5-chloro-quinolin-8-oxy-acetate, 1-allyloxy-prop-2-yl 5-chloroquinolin-8-oxy-acetate, methyl 5-chloro-quinoxalin-8-oxy-acetate, ethyl 5-chloroquinolin-8-oxy-acetate, allyl 5-chloro-quinoxalin-8-oxy-acetate, 2-oxo-prop-1-yl 5-chloro-quinolin-8-oxy-acetate, diethyl 5-chloro-quinolin-8-oxy-malonate, diallyl 5-chloro-quinoxalin-8-oxy-malonate, diethyl 5-chloro-quinolin-8-oxy-malonate, 4-carboxy-chroman-4-yl-acetic acid (AC-304415), 4-chloro-phenoxy-acetic acid, 3,3'-dimethyl-4-methoxy-benzophenone, 1-bromo-4-chloromethyl sulphonyl-benzene, 1-[4-(N-2-methoxybenzoylsulphamoyl)-phenyl]-3-methyl-urea (alias N-(2-methoxy-benzoyl)-4-[(methylamino-carbonyl)-amino]-benzenesulphonamide), 1-[4-(N-2-methoxy-benzoylsulphamoyl)-phenyl]-3,3-dimethyl-urea, 1-[4-(N-4,5-dimethylbenzoylsulphamoyl)-phenyl]-3-methyl-urea, 1-[4-(N-naphthylsulphamoyl)-phenyl]-3,3-dimethyl-urea, N-(2-methoxy-5-methyl-benzoyl)-4-(cyclopropylaminocarbonyl)-benzenesulphonamide,

and/or one of the following compounds of the general formula (IIa)



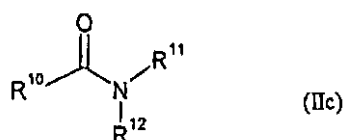
or of the general formula (IIb)

- 9 -



or the formula (IIc)

5

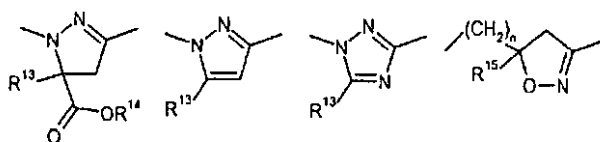


where

m represents a number 0, 1, 2, 3, 4 or 5,

10

A¹ represents one of the divalent heterocyclic groupings shown below



15 n represents a number 0, 1, 2, 3, 4 or 5,

A² represents optionally C₁-C₄-alkyl- and/or C₁-C₄-alkoxy-carbonyl- and/or C₁-C₄-alkenyloxy-carbonyl-substituted alkanediyl with 1 or 2 carbon atoms,

20 R⁸ represents hydroxyl, mercapto, amino, C₁-C₆-alkoxy, C₁-C₆-alkylthio, C₁-C₆-alkylamino or di-(C₁-C₄-alkyl)-amino,

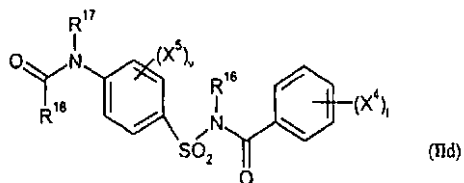
25 R⁹ represents hydroxyl, mercapto, amino, C₁-C₇-alkoxy, C₁-C₆-alkenyloxy, C₁-C₆-alkenyloxy-C₁-C₆-alkoxy, C₁-C₆-alkylthio, C₁-C₆-alkylamino or di-(C₁-C₄-alkyl)-amino,

R¹⁰ represents in each case optionally fluorine-, chlorine- and/or bromine-

substituted C₁-C₄-alkyl,

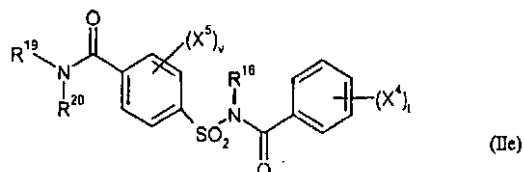
- 5 R¹¹ represents hydrogen, in each case optionally fluorine-, chlorine- and/or bromine-substituted C₁-C₆-alkyl, C₂-C₆-alkenyl or C₂-C₆-alkynyl, C₁-C₄-alkoxy-C₁-C₄-alkyl, dioxolanyl-C₁-C₄-alkyl, furyl, furyl-C₁-C₄-alkyl, thienyl, thiazolyl, piperidinyl, or optionally fluorine-, chlorine- and/or bromine- or C₁-C₄-alkyl-substituted phenyl,
- 10 R¹² represents hydrogen, in each case optionally fluorine-, chlorine- and/or bromine-substituted C₁-C₆-alkyl, C₂-C₆-alkenyl or C₂-C₆-alkynyl, C₁-C₄-alkoxy-C₁-C₄-alkyl, dioxolanyl-C₁-C₄-alkyl, furyl, furyl-C₁-C₄-alkyl, thienyl, thiazolyl, piperidinyl, or optionally fluorine-, chlorine- and/or bromine- or C₁-C₄-alkyl-substituted phenyl, or R¹¹ and R¹² together also represent C₃-C₆-alkanediyl or C₂-C₅-oxaalkanediyl, each of which is optionally substituted by
- 15 C₁-C₄-alkyl, phenyl, furyl, a fused-on benzene ring or by two substituents which together with the C atom to which they are attached form a 5- or 6-membered carbocycle,
- 20 R¹³ represents hydrogen, cyano, halogen, or represents in each case optionally fluorine-, chlorine- and/or bromine-substituted C₁-C₄-alkyl, C₃-C₆-cycloalkyl or phenyl,
- 25 R¹⁴ represents hydrogen, optionally hydroxyl-, cyano-, halogen- or C₁-C₄-alkoxy-substituted C₁-C₆-alkyl, C₃-C₆-cycloalkyl or tri-(C₁-C₄-alkyl)-silyl,
- R¹⁵ represents hydrogen, cyano, halogen, or represents in each case optionally fluorine-, chlorine- and/or bromine-substituted C₁-C₄-alkyl, C₃-C₆-cycloalkyl or phenyl,
- 30 X¹ represents nitro, cyano, halogen, C₁-C₄-alkyl, C₁-C₄-haloalkyl, C₁-C₄-alkoxy or C₁-C₄-haloalkoxy,
- X² represents hydrogen, cyano, nitro, halogen, C₁-C₄-alkyl, C₁-C₄-haloalkyl, C₁-C₄-alkoxy or C₁-C₄-haloalkoxy,
- 35 X³ represents hydrogen, cyano, nitro, halogen, C₁-C₄-alkyl, C₁-C₄-haloalkyl, C₁-C₄-alkoxy or C₁-C₄-haloalkoxy,

and/or the following compounds defined by general formulae of the general formula (IIc)



5

or of the general formula (IIe)



10 where

t represents a number 0, 1, 2, 3, 4 and 5,

v represents a number 0, 1, 2, 3, 4 and 5,

15

R¹⁶ represents hydrogen or C₁-C₄-alkyl,

R¹⁷ represents hydrogen or C₁-C₄-alkyl,

20

R¹⁸ represents hydrogen, in each case optionally cyano-, halogen- or C₁-C₄-alkoxy-substituted C₁-C₆-alkyl, C₁-C₆-alkoxy, C₁-C₆-alkylthio, C₁-C₆-alkylamino or di-(C₁-C₄-alkyl)-amino, or in each case optionally cyano-, halogen- or C₁-C₄-alkyl-substituted C₃-C₆-cycloalkyl, C₃-C₆-cycloalkyloxy, C₃-C₆-cycloalkylthio or C₃-C₆-cycloalkylamino,

25

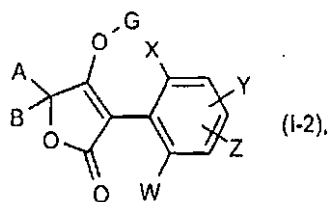
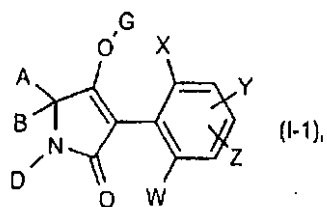
R¹⁹ represents hydrogen, optionally cyano-, hydroxyl-, halogen- or C₁-C₄-alkoxy-substituted C₁-C₆-alkyl, in each case optionally cyano- or halogen-substituted C₃-C₆-alkenyl or C₃-C₆-alkynyl, or optionally cyano-, halogen- or C₁-C₄-alkyl-substituted C₃-C₆-cycloalkyl,

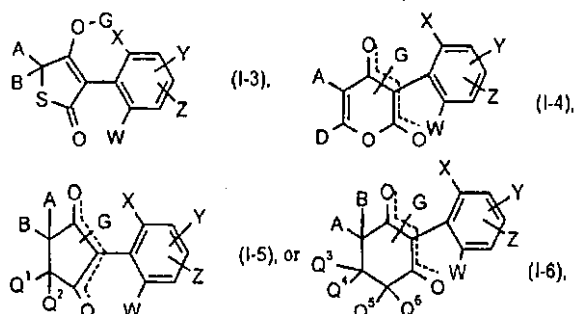
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CN101762000A (20100503) 1-10

- 12b -

Including the meanings (1) to (6) of the group CKE, the following principal structures (I-1) to (I-6) result:





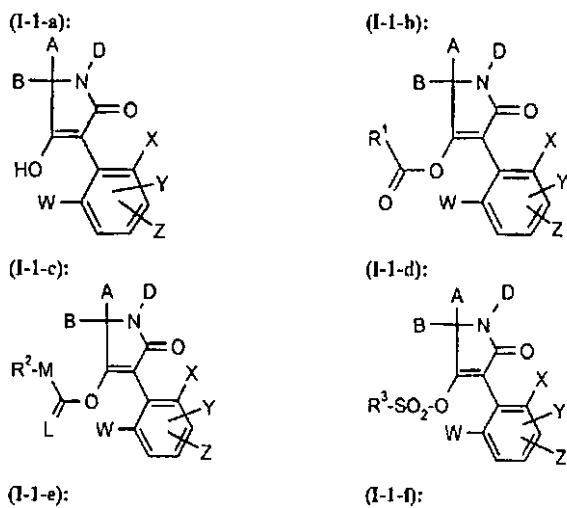
in which

5

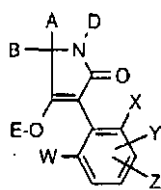
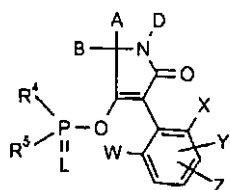
A, B, D, G, Q¹, Q², Q³, Q⁴, Q⁵, Q⁶, W, X, Y and Z are as defined above.

Including the different meanings (a), (b), (c), (d), (e), (f) and (g) of the group G, the following principal structures (I-1-a) to (I-1-g) result if CKE represents the group (I),

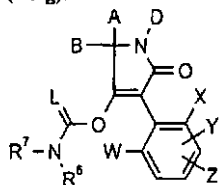
10



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(I-1-g):



in which

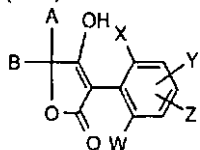
S

A, B, D, E, L, M, W, X, Y, Z, R¹, R², R³, R⁴, R⁵, R⁶ and R⁷ are as defined above.

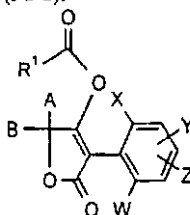
Including the different meanings (a), (b), (c), (d), (e), (f) and (g) of the group G, the following principal structures (I-2-a) to (I-2-g) result if CKE represents the group (2)

10

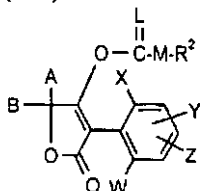
(I-2-a):



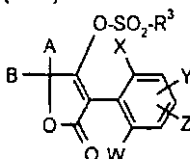
(I-2-b):



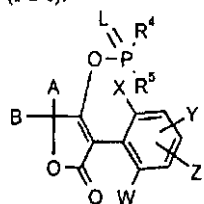
(I-2-c):



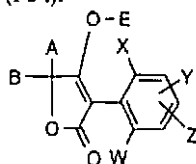
(I-2-d):



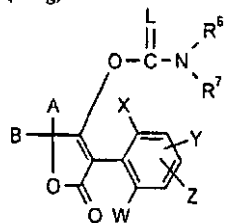
(I-2-e):



(I-2-f):



(I-2-g):



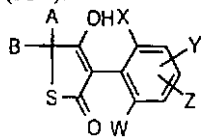
in which

A, B, E, L, M, W, X, Y, Z, R¹, R², R³, R⁴, R⁵, R⁶ and R⁷ are as defined above.

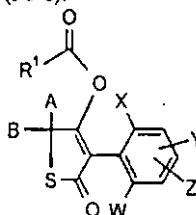
5

Including the different meanings (a), (b), (c), (d), (e), (f) and (g) of the group G, the following principal structures (I-3-a) to (I-3-g) result if CKE represents the group (3)

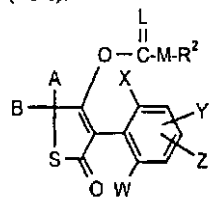
(I-3-a):



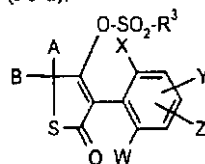
(I-3-b):



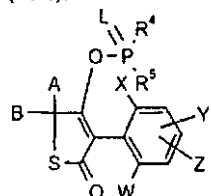
(I-3-c):



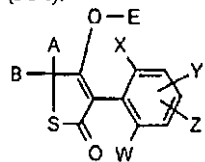
(I-3-d):



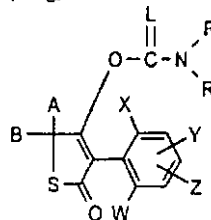
(I-3-e):



(I-3-f):



(I-3-g):

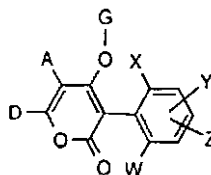


5

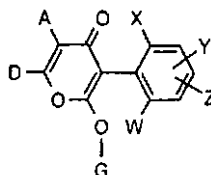
in which

A, B, E, L, M, W, X, Y, Z, R¹, R², R³, R⁴, R⁵, R⁶ and R⁷ are as defined above.

- 10 Depending on the position of the substituent G, the compounds of the formula (I-4) can be present in the two isomeric forms of the formulae (I-4-A) and (I-4-B)



(I-4-A)



(I-4-B)

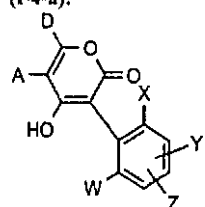
which is meant to be indicated by the broken line in formula (I-4).

5 The compounds of the formulae (I-4-A) and (I-4-B) can be present both as mixtures and in the form of their pure isomers. Mixtures of the compounds of the formulae (I-4-A) and (I-4-B) can, if appropriate, be separated in a manner known per se by physical methods, for example by chromatographic methods.

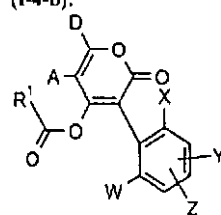
10 For reasons of clarity, hereinbelow only one of the possible isomers is shown in each case. This does not exclude that the compounds may, if appropriate, be present in the form of the isomer mixtures or in the respective other isomeric form.

15 Including the different meanings (a), (b), (c), (d), (e), (f) and (g) of the group G, the following principal structures (I-4-a) to (I-4-g) result if CKE represents the group (4)

(I-4-a):

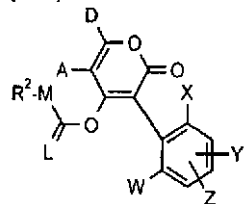


(I-4-b):

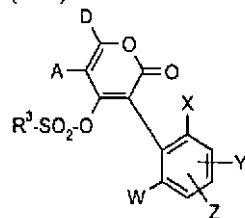


- 18 -

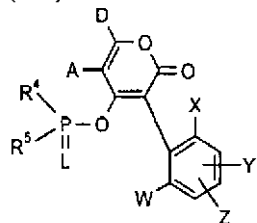
(I-4-c):



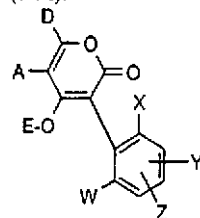
(I-4-d):



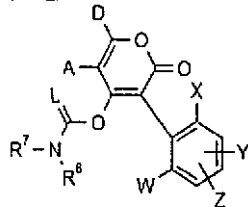
(I-4-e):



(I-4-f):



(I-4-g):

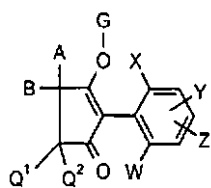


in which

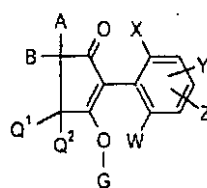
5 A, D, E, L, M, W, X, Y, Z, R¹, R², R³, R⁴, R⁵, R⁶ and R⁷ are as defined above.

Depending on the position of the substituent G, the compounds of the formula (I-5) can be present in the two isomeric forms of the formulae (I-5-A) and (I-5-B)

- 19 -



(I-5-A)



(I-5-B)

which is meant to be indicated by the broken line in the formula (I).

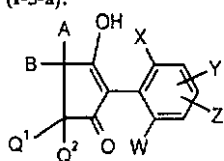
5 The compounds of the formulae (I-5-A) and (I-5-B) can be present both as mixtures and in the form of their pure isomers. Mixtures of the compounds of the formulae (I-5-A) and (I-5-B) can, if appropriate, be separated by physical methods, for example by chromatographic methods.

10 For reasons of clarity, hereinbelow only one of the possible isomers is shown in each case. This does not exclude that the compounds may, if appropriate, be present in the form of the isomer mixtures or in the respective other isomeric form.

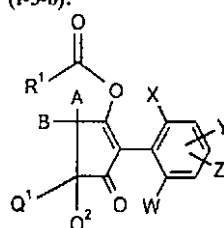
Including the different meanings (a), (b), (c), (d), (e), (f) and (g) of the group G, the following principal structures (I-5-a) to (I-5-g) result:

15

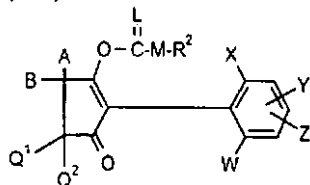
(I-5-a):



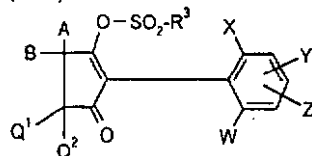
(I-5-b):



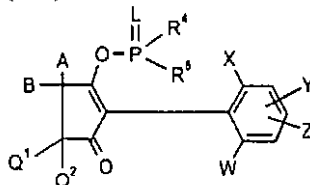
(I-5-c):



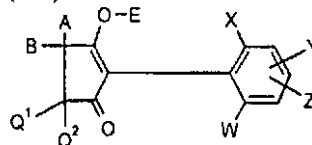
(I-5-d):



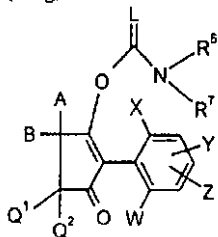
(I-5-e):



(I-5-f):



(I-5-g):

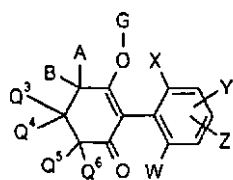


in which

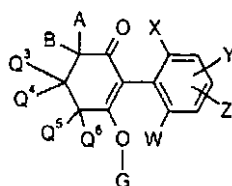
- 5 A, B, Q¹, Q², E, L, M, W, X, Y, Z, R¹, R², R³, R⁴, R⁵, R⁶ and R⁷ are as defined above.

- 10 Depending on the position of the substituent G, the compounds of the formula (I-6) can be present in the two isomeric forms of the formulae (I-6-A) and (I-6-B) which is meant to be indicated by the broken line in the formula (I-6):

- 21 -



(I-6-A)



(I-6-B)

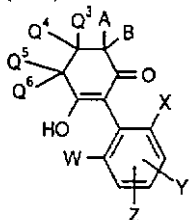
- The compounds of the formulae (I-6-A) and (I-6-B) can be present both as mixtures and in the form of their pure isomers. Mixtures of the compounds of the formulae (I-6-A) and (I-6-B) may, if appropriate, be separated by physical methods, for example by chromatographic methods.

For reasons of clarity, hereinbelow only one of the possible isomers is shown in each case. This includes that the compound in question may, if appropriate, be present as an isomer mixture or in the respective other isomeric form.

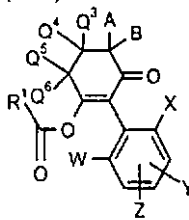
10

Including the different meanings (a), (b), (c), (d), (e), (f) and (g) of the group G, the following principal structures (I-6-a) to (I-6-g) result:

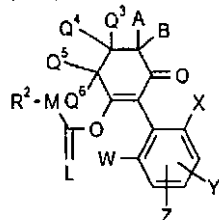
(I-6-a):



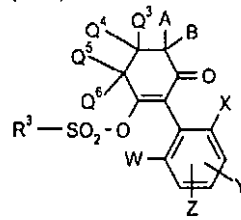
(I-6-b):



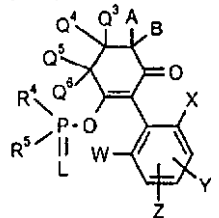
(I-6-c):



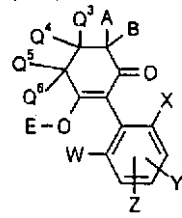
(I-6-d):



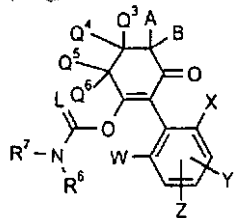
(I-6-e):



(I-6-f):



(I-6-g):



in which

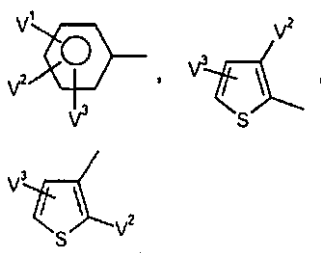
- 5 A, B, E, L, M, Q³, Q⁴, Q⁵, Q⁶, W, X, Y, Z, R¹, R², R³, R⁴, R⁵, R⁶ and R⁷ are as defined above.

The formula (I) provides a general definition of the substituted cyclic ketoenols according to the invention of the acaricidal and insecticidal compositions. Preferred
 10 substituents and ranges of the radicals given in the formulae mentioned above and below are illustrated below:

X preferably represents halogen, C₁-C₆-alkyl, C₂-C₆-alkenyl, C₂-C₆-alkynyl, C₁-

C₆-haloalkyl, C₁-C₆-alkoxy, C₃-C₆-alkenyloxy, C₁-C₆-haloalkoxy, C₃-C₆-haloalkenyloxy, nitro or cyano,

- 5 Z preferably represents hydrogen, halogen, C₁-C₆-alkyl, C₂-C₆-alkenyl, C₂-C₆-alkynyl or represents one of the radicals

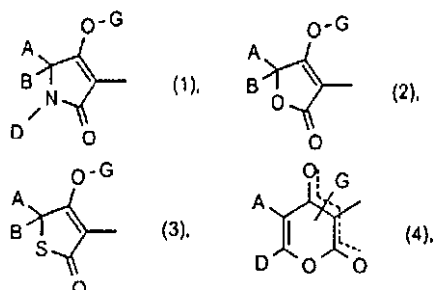


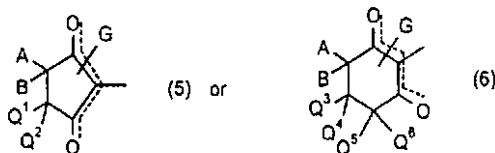
in which

- 10 V¹ represents hydrogen, halogen, C₁-C₁₂-alkyl, C₁-C₆-alkoxy, C₁-C₆-alkylthio, C₁-C₆-alkylsulphinyl, C₁-C₆-alkylsulphonyl, C₁-C₄-haloalkyl, C₁-C₄-haloalkoxy, nitro or cyano,
- 15 V² and V³ independently of one another represent hydrogen, halogen, C₁-C₆-alkyl, C₁-C₆-alkoxy, C₁-C₄-haloalkyl or C₁-C₄-haloalkoxy,

W and Y independently of one another preferably represent hydrogen, halogen, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy, C₁-C₆-haloalkoxy, nitro or cyano,

- 20 CKE preferably represents one of the groups





- A preferably represents hydrogen or in each case optionally halogen-substituted C₁-C₁₂-alkyl, C₃-C₈-alkenyl, C₁-C₁₀-alkoxy-C₁-C₈-alkyl, C₁-C₁₀-alkylthio-C₁-C₆-alkyl, optionally halogen-, C₁-C₆-alkyl- or C₁-C₆-alkoxy-substituted C₃-C₈-cycloalkyl in which optionally one or two not directly adjacent ring members are replaced by oxygen and/or sulphur or represents in each case optionally halogen-, C₁-C₆-alkyl-, C₁-C₆-haloalkyl-, C₁-C₆-alkoxy-, C₁-C₆-haloalkoxy-, cyano- or nitro-substituted phenyl or phenyl-C₁-C₆-alkyl,
- B preferably represents hydrogen, C₁-C₁₂-alkyl or C₁-C₈-alkoxy-C₁-C₆-alkyl, or
- A, B and the carbon atom to which they are attached preferably represent saturated C₃-C₁₀-cycloalkyl or unsaturated C₃-C₁₀-cycloalkyl in which optionally one ring member is replaced by oxygen or sulphur and which are optionally mono- or disubstituted by C₁-C₄-alkyl, C₃-C₁₀-cycloalkyl, C₁-C₈-haloalkyl, C₁-C₈-alkoxy, C₁-C₈-alkylthio, halogen or phenyl, or
- A, B and the carbon atom to which they are attached preferably represent C₅-C₈-cycloalkyl which is substituted by an alkylenediyl or by an alkylenedioyl or by an alkylenedithiol group which, with the carbon atom to which it is attached, forms a further 5- to 8-membered ring and which is optionally substituted by C₁-C₄-alkyl which optionally contains one or two not directly adjacent oxygen and/or sulphur atoms, or
- A, B and the carbon atom to which they are attached preferably represent C₃-C₄-cycloalkyl or C₃-C₄-cycloalkenyl in which two substituents together with the carbon atoms to which they are attached represent in each case optionally C₁-C₆-alkyl-, C₁-C₆-alkoxy- or halogen-substituted C₂-C₆-alkanediyl, C₂-C₆-alkenediyl or C₄-C₆-alkanedicnodiyl in which optionally one methylene group is replaced by oxygen or sulphur,
- D preferably represents hydrogen, in each case optionally halogen-substituted C₁-C₁₂-alkyl, C₃-C₈-alkenyl, C₃-C₈-alkynyl, C₁-C₁₀-alkoxy-C₂-C₈-alkyl,

optionally halogen-, C₁-C₄-alkyl-, C₁-C₄-alkoxy- or C₁-C₄-haloalkyl-substituted C₃-C₈-cycloalkyl in which optionally one ring member is replaced by oxygen or sulphur or represents in each case optionally halogen-, C₁-C₆-alkyl-, C₁-C₆-haloalkyl-, C₁-C₆-alkoxy-, C₁-C₆-haloalkoxy-, cyano- or nitro-substituted phenyl or phenyl-C₁-C₆-alkyl, or

A and D together preferably represent in each case optionally substituted C₃-C₆-alkanediyl or C₃-C₆-alkenediyl in which optionally one methylene group is replaced by a carbonyl group, by oxygen or by sulphur, and

possible substituents being in each case:

halogen, hydroxyl, mercapto or in each case optionally halogen-substituted C₁-C₁₀-alkyl or C₁-C₆-alkoxy, or a further C₃-C₆-alkanediyl grouping, C₃-C₆-alkenediyl grouping or a butadienyl grouping which is optionally substituted by C₁-C₆-alkyl or in which optionally two adjacent substituents together with the carbon atoms to which they are attached form a further saturated or unsaturated cycle having 5 or 6 ring atoms (in the case of the compounds of the formula (I-1), A and D together with the atoms to which they are attached then represent, for example, the groups AD-1 to AD-10 mentioned further below), which may contain oxygen or sulphur,

A and Q¹ together preferably represent C₃-C₆-alkanediyl or C₄-C₆-alkenediyl, each of which is optionally mono- or disubstituted by identical or different halogens, by C₁-C₁₀-alkyl, C₁-C₆-alkoxy, C₁-C₆-alkylthio, C₃-C₇-cycloalkyl, each of which is optionally mono- to trisubstituted by identical or different halogens, or by benzyloxy or phenyl, each of which is optionally mono- to trisubstituted by identical or different substituents from the group consisting of halogen, C₁-C₆-alkyl and C₁-C₆-alkoxy, where the C₃-C₆-alkanediyl or C₄-C₆-alkenediyl is furthermore bridged by a C₁-C₂-alkanediyl group or by an oxygen atom, or

Q¹ preferably represents hydrogen or C₁-C₄-alkyl,

Q², Q⁴, Q⁵ and Q⁶ independently of one another preferably represent hydrogen or C₁-C₄-alkyl,

Q³ preferably represents hydrogen, C₁-C₆-alkyl, C₁-C₆-alkoxy-C₁-C₂-alkyl, C₁-C₆-alkylthio-C₁-C₂-alkyl, optionally halogen-, C₁-C₆-alkyl- or C₁-C₄-

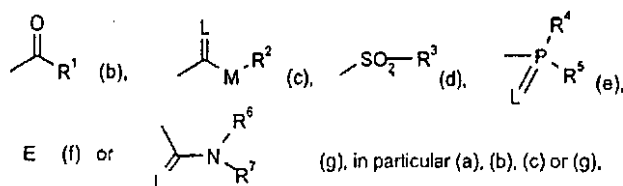
alkoxy-substituted C₃-C₈-cycloalkyl in which optionally one methylene group is replaced by oxygen or sulphur or represents optionally halogen-, C₁-C₄-alkyl-, C₁-C₄-alkoxy-, C₁-C₂-haloalkyl-, C₁-C₂-haloalkoxy-, cyano- or nitro-substituted phenyl, or

5

Q³ and Q⁴ together with the carbon atom to which they are attached preferably represent an optionally C₁-C₄-alkyl-, C₁-C₄-alkoxy- or C₁-C₂-haloalkyl-substituted C₃-C₇-ring in which optionally one ring atom is replaced by oxygen or sulphur,

10

G preferably represents hydrogen (a) or represents one of the groups



in which

15

E represents a metal ion equivalent or an ammonium ion,

L represents oxygen or sulphur and

20

M represents oxygen or sulphur,

R¹ preferably represents in each case optionally halogen-substituted C₁-C₂₀-alkyl, C₂-C₂₀-alkenyl, C₁-C₈-alkoxy-C₁-C₈-alkyl, C₁-C₈-alkylthio-C₁-C₈-alkyl, poly-C₁-C₈-alkoxy-C₁-C₈-alkyl or optionally halogen-, C₁-C₆-alkyl- or C₁-C₆-alkoxy-substituted C₃-C₈-cycloalkyl in which optionally one or more (preferably not more than two) not directly adjacent ring members are replaced by oxygen and/or sulphur,

25

represents optionally halogen-, cyano-, nitro-, C₁-C₆-alkyl-, C₁-C₆-alkoxy-, C₁-C₆-haloalkyl-, C₁-C₆-haloalkoxy-, C₁-C₆-alkylthio- or C₁-C₆-alkylsulphonyl-substituted phenyl,

30

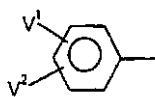
represents optionally halogen-, nitro-, cyano-, C₁-C₆-alkyl-, C₁-C₆-alkoxy-,

- C₁-C₆-haloalkyl- or C₁-C₆-haloalkoxy-substituted phenyl-C₁-C₆-alkyl,
- 5 represents optionally halogen- or C₁-C₆-alkyl-substituted 5- or 6-membered hetaryl (for example pyrazolyl, thiazolyl, pyridyl, pyrimidyl, furanyl or thienyl),
- represents optionally halogen- or C₁-C₆-alkyl-substituted phenoxy-C₁-C₆-alkyl or
- 10 represents optionally halogen-, amino- or C₁-C₆-alkyl-substituted 5- or 6-membered hetaryloxy-C₁-C₆-alkyl (for example pyridyloxy-C₁-C₆-alkyl, pyrimidyloxy-C₁-C₆-alkyl or thiazolyloxy-C₁-C₆-alkyl),
- R² preferably represents in each case optionally halogen-substituted C₁-C₂₀-alkyl,
- 15 C₂-C₂₀-alkenyl, C₁-C₈-alkoxy-C₂-C₈-alkyl, poly-C₁-C₈-alkoxy-C₂-C₈-alkyl,
- represents optionally halogen-, C₁-C₆-alkyl- or C₁-C₆-alkoxy-substituted C₃-C₈-cycloalkyl or
- 20 represents in each case optionally halogen-, cyano-, nitro-, C₁-C₆-alkyl, C₁-C₆-alkoxy-, C₁-C₆-haloalkyl- or C₁-C₆-haloalkoxy substituted phenyl or benzyl,
- R³ preferably represents optionally halogen-substituted C₁-C₈-alkyl or represents
- 25 in each case optionally halogen-, C₁-C₆-alkyl-, C₁-C₆-alkoxy-, C₁-C₄-haloalkyl-, C₁-C₄-haloalkoxy-, cyano- or nitro-substituted phenyl or benzyl,
- R⁴ and R⁵ independently of one another preferably represent in each case optionally
- 30 halogen-substituted C₁-C₈-alkyl, C₁-C₈-alkoxy, C₁-C₈-alkylamino, di-(C₁-C₈-alkyl)amino, C₁-C₈-alkylthio, C₂-C₈-alkenylthio, C₃-C₇-cycloalkylthio or represent in each case optionally halogen-, nitro-, cyano-, C₁-C₄-alkoxy-, C₁-C₄-haloalkoxy-, C₁-C₄-alkylthio-, C₁-C₄-haloalkylthio-, C₁-C₄-alkyl- or C₁-C₄-haloalkyl-substituted phenyl, phenoxy or phenylthio,
- 35 R⁶ and R⁷ independently of one another preferably represent hydrogen, represent in each case optionally halogen-substituted C₁-C₈-alkyl, C₃-C₈-cycloalkyl, C₁-C₈-alkoxy, C₃-C₈-alkenyl, C₁-C₈-alkoxy-C₁-C₈-alkyl, represent optionally

halogen-, C₁-C₈-haloalkyl-, C₁-C₈-alkyl- or C₁-C₈-alkoxy-substituted phenyl, optionally halogen-, C₁-C₈-alkyl-, C₁-C₈-haloalkyl- or C₁-C₈-alkoxy-substituted benzyl or together represent an optionally C₁-C₄-alkyl-substituted C₃-C₆-alkylene radical in which optionally one carbon atom is replaced by oxygen or sulphur.

In the radical definitions mentioned as being preferred, halogen represents fluoroine, chlorine, bromine and iodine, in particular fluorine, chlorine and bromine.

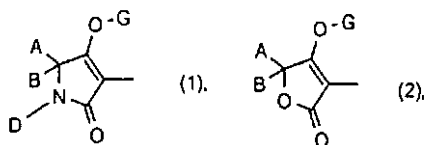
- 10 X particularly preferably represents fluorine, chlorine, bromine, C₁-C₄-alkyl, C₂-C₄-alkenyl, C₂-C₄-alkynyl, C₁-C₄-alkoxy, C₁-C₄-haloalkyl, C₁-C₄-haloalkoxy or cyano,
- 15 Z particularly preferably represents hydrogen, fluorine, chlorine, bromine, C₁-C₄-alkyl, C₂-C₄-alkenyl, C₂-C₄-alkynyl or represents the radical



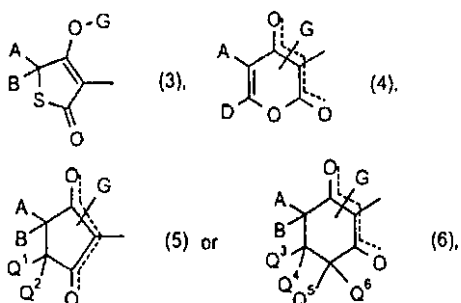
- 20 V¹ particularly preferably represents hydrogen, fluorine, chlorine, bromine, C₁-C₄-alkyl, C₁-C₄-alkoxy, C₁-C₂-haloalkyl, C₁-C₂-haloalkoxy, nitro or cyano,
- V² particularly preferably represents hydrogen, fluorine, chlorine, bromine, C₁-C₄-alkyl, C₁-C₄-alkoxy, C₁-C₂-haloalkyl or C₁-C₂-haloalkoxy,

- 25 W and Y independently of one another particularly preferably represent hydrogen, fluorine, chlorine, bromine, C₁-C₄-alkyl, C₁-C₄-haloalkyl, C₁-C₄-alkoxy or C₁-C₄-haloalkoxy,

CKE particularly preferably represents one of the groups

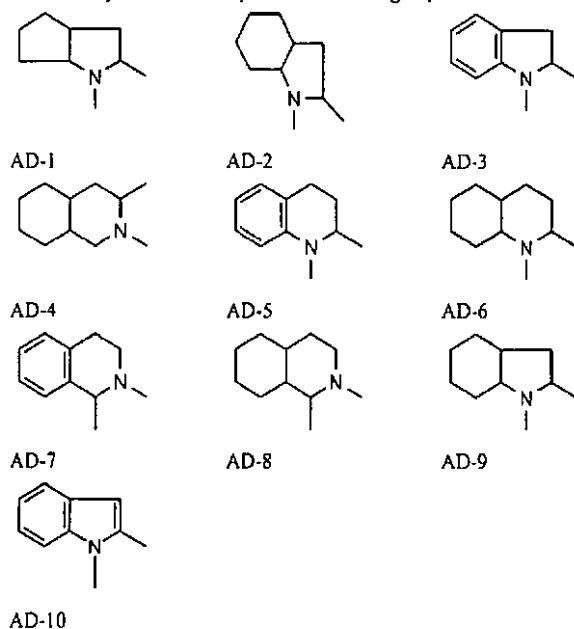


- 29 -



- 5 A particularly preferably represents hydrogen, in each case optionally fluorine- or chlorine-substituted C_1-C_6 -alkyl, C_1-C_4 -alkoxy- C_1-C_4 -alkyl or optionally fluorine-, chlorine-, C_1-C_4 -alkyl- or C_1-C_4 -alkoxy-substituted C_3-C_7 -cycloalkyl,
- 10 B particularly preferably represents hydrogen or C_1-C_6 -alkyl, or
- 15 A, B and the carbon atom to which they are attached particularly preferably represent saturated C_3-C_7 -cycloalkyl or unsaturated C_3-C_7 -cycloalkyl in which optionally one ring member is replaced by oxygen or sulphur and which is optionally monosubstituted by C_1-C_6 -alkyl, C_1-C_3 -haloalkyl or C_1-C_6 -alkoxy, or
- 20 A, B and the carbon atom to which they are attached particularly preferably represent C_3-C_6 -cycloalkyl which is substituted by an alkylenediyl or by an alkylenedioxy or by an alkylenedithiol group which, together with the carbon atom to which it is attached, forms a further five- or six-membered ring and which is optionally substituted by methyl or ethyl and optionally contains one or two not directly adjacent oxygen or sulphur atoms,
- 25 D particularly preferably represents hydrogen, represents in each case optionally fluorine- or chlorine-substituted C_1-C_6 -alkyl, C_3-C_6 -alkenyl, C_1-C_4 -alkoxy- C_2-C_3 -alkyl, represents optionally C_1-C_4 -alkyl-, C_1-C_4 -alkoxy- or C_1-C_2 -haloalkyl-substituted C_3-C_7 -cycloalkyl, or
- 30 A and D together particularly preferably represent optionally substituted C_3-C_5 -alkanediyl in which one methylene group may be replaced by oxygen or sulphur, possible substituents being C_1-C_4 -alkyl, or

A and D (in the case of the compounds of the formula (I-1)) together with the atoms to which they are attached represent one of the groups AD-1 to AD-10:

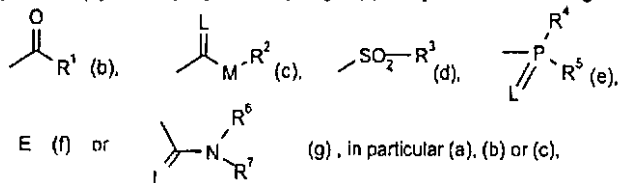


- 5 A and Q¹ together particularly preferably represent C₃-C₄-alkanediyl or C₃-C₄-alkenediyl, each of which is optionally mono- or disubstituted by identical or different substituents from the group consisting of C₁-C₄-alkyl and C₁-C₄-alkoxy, or
- 10 Q¹ particularly preferably represents hydrogen,
- Q² particularly preferably represents hydrogen,
- Q⁴, Q⁵ and Q⁶ independently of one another particularly preferably represent
- 15 hydrogen or C₁-C₂-alkyl,
- Q³ particularly preferably represents hydrogen, C₁-C₄-alkyl, C₁-C₄-alkoxy-C₁-C₂-alkyl, C₃-C₄-alkylthio-C₁-C₂-alkyl or optionally methyl- or methoxy-substituted C₃-C₆-cycloalkyl in which optionally one methylene group is

replaced by oxygen or sulphur, or

5 Q³ and Q⁴ together with the carbon to which they are attached particularly preferably represent an optionally C₁-C₄-alkyl- or C₁-C₄-alkoxy-substituted saturated C₃-C₆-ring in which optionally one ring member is replaced by oxygen or sulphur,

G particularly preferably represents hydrogen (a) or represents one of the groups



10 in which

E represents a metal ion equivalent or an ammonium ion,

L represents oxygen or sulphur and

15

M represents oxygen or sulphur,

20 R¹ particularly preferably represents in each case optionally fluorine- or chlorine-substituted C₁-C₁₆-alkyl, C₂-C₁₆-alkenyl, C₁-C₆-alkoxy-C₁-C₄-alkyl, C₁-C₆-alkylthio-C₁-C₆-alkyl or optionally fluorine-, chlorine-, C₁-C₄-alkyl- or C₁-C₄-alkoxy-substituted C₃-C₇-cycloalkyl in which optionally one or two not directly adjacent ring members are replaced by oxygen and/or sulphur,

25 represents optionally fluorine-, chlorine-, bromine-, cyano-, nitro-, C₁-C₄-alkyl-, C₁-C₄-alkoxy-, C₁-C₃-haloalkyl- or C₁-C₃-haloalkoxy-substituted phenyl,

30 R² particularly preferably represents in each case optionally fluorine-substituted C₁-C₁₆-alkyl, C₂-C₁₆-alkenyl or C₁-C₆-alkoxy-C₂-C₆-alkyl,

represents optionally fluorine-, chlorine-, C₁-C₄-alkyl- or C₁-C₄-alkoxy-substituted C₃-C₇-cycloalkyl,

represents in each case optionally fluorine-, chlorine-, bromine-, cyano-, nitro-, C₁-C₄-alkyl-, C₁-C₃-alkoxy-, C₁-C₃-haloalkyl- or C₁-C₃-haloalkoxy-substituted phenyl or benzyl,

5 R³ particularly preferably represents optionally fluorine-substituted C₁-C₆-alkyl or represents optionally fluorine-, chlorine-, bromine-, C₁-C₄-alkyl-, C₁-C₄-alkoxy-, C₁-C₃-haloalkyl-, C₁-C₃-haloalkoxy-, cyano- or nitro-substituted phenyl,

10 R⁴ particularly preferably represents C₁-C₆-alkyl, C₁-C₆-alkoxy, C₁-C₆-alkylamino, di-(C₁-C₆-alkyl)amino, C₁-C₆-alkylthio, C₃-C₄-alkenylthio, C₃-C₆-cycloalkylthio or represents in each case optionally fluorine-, chlorine-, bromine-, nitro-, cyano-, C₁-C₃-alkoxy-, C₁-C₃-haloalkoxy-, C₁-C₃-alkylthio-, C₁-C₃-haloalkylthio-, C₁-C₃-alkyl- or C₁-C₃-haloalkyl-substituted phenyl, phenoxy or phenylthio,

15 R⁵ particularly preferably represents C₁-C₆-alkoxy or C₁-C₆-alkylthio,

20 R⁶ particularly preferably represents hydrogen, C₁-C₆-alkyl, C₃-C₆-cycloalkyl, C₁-C₆-alkoxy, C₃-C₆-alkenyl, C₁-C₆-alkoxy-C₁-C₄-alkyl, represents optionally fluorine-, chlorine-, bromine-, C₁-C₃-haloalkyl-, C₁-C₄-alkyl- or C₁-C₄-alkoxy-substituted phenyl, represents optionally fluorine-, chlorine-, bromine-, C₁-C₄-alkyl-, C₁-C₃-haloalkyl- or C₁-C₄-alkoxy-substituted benzyl,

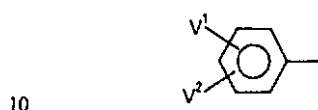
25 R⁷ particularly preferably represents C₁-C₆-alkyl, C₃-C₆-alkenyl or C₁-C₆-alkoxy-C₁-C₄-alkyl, or

R⁶ and R⁷ together particularly preferably represent an optionally methyl- or ethyl-substituted C₄-C₅-alkylene radical in which optionally one methylene group is replaced by oxygen or sulphur.

30 In the radical definitions mentioned as being particularly preferred, halogen represents fluorine, chlorine, bromine and iodine, in particular fluorine, chlorine and bromine.

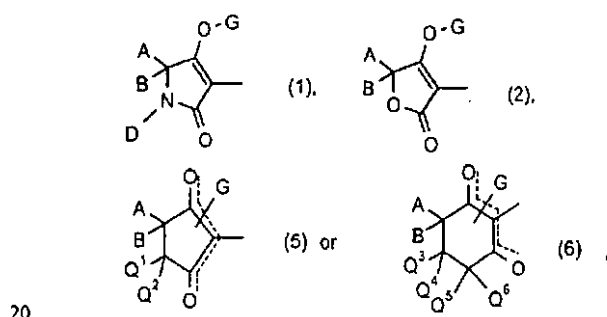
35 W very particularly preferably represents hydrogen, chlorine, bromine, methyl, ethyl or methoxy,

- X very particularly preferably represents chlorine, bromine, methyl, ethyl, methoxy, ethoxy or trifluoromethyl,
- Y very particularly preferably represents hydrogen, chlorine, bromine, methyl, ethyl, propyl or trifluoromethyl,
- 5 Z very particularly preferably represents hydrogen, chlorine, bromine, methyl or represents the radical



- V¹ very particularly preferably represents hydrogen, fluorine, chlorine, methyl, ethyl, methoxy, trifluoromethyl or trifluoromethoxy,
- 15 V² very particularly preferably represents hydrogen, fluorine, chlorine or methyl,

CKE very particularly preferably represents one of the groups



- A very particularly preferably represents hydrogen, in each case optionally fluorine-substituted C₁-C₄-alkyl, C₁-C₂-alkoxy-C₁-C₂-alkyl or C₃-C₆-cycloalkyl,
- 25 B very particularly preferably represents hydrogen or methyl, or
- A, B and the carbon atom to which they are attached very particularly preferably represent saturated C₃-C₆-cycloalkyl in which optionally one ring member is

replaced by oxygen or sulphur and which is optionally monosubstituted by methyl, ethyl, propyl, trifluoromethyl, methoxy, ethoxy, propoxy, butoxy or isobutoxy, or

- 5 A, B and the carbon atom to which they are attached very particularly preferably represent C₅-C₆-cycloalkyl which is substituted by an alkylenedioxy group which contains two not directly adjacent oxygen atoms and which, together with the carbon to which they are attached, form a further five- or six-membered ring,

10

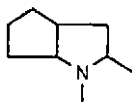
- D very particularly preferably represents hydrogen, C₁-C₄-alkyl, C₃-C₄-alkenyl, C₁-C₂-alkoxy, C₂-C₃-alkyl or C₃-C₆-cycloalkyl,

or

15

- A and D together very particularly preferably represent optionally substituted C₃-C₅-alkanediyl in which optionally one carbon atom is replaced by oxygen or sulphur,

- 20 A and D (in the case of the compounds of the formula (I-1)) together with the atoms to which they are attached represent the group:

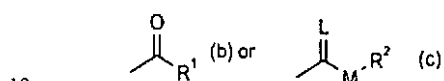


AD-1

- 25 A and Q¹ together very particularly preferably represent C₃-C₄-alkanediyl which is optionally mono- or disubstituted by methyl or methoxy, or
 Q¹ very particularly preferably represents hydrogen,
 Q² very particularly preferably represents hydrogen,
 30 Q⁴, Q⁵ and Q⁶ independently of one another very particularly preferably represent hydrogen or methyl,
 Q³ very particularly preferably represents hydrogen, methyl, ethyl or C₃-C₆-cycloalkyl, or
 35

Q³ and Q⁴ together with the carbon to which they are attached very particularly preferably represent a saturated C₅-C₆-ring which is optionally substituted by methyl or methoxy and in which optionally one ring member is replaced by oxygen,

G very particularly preferably represents hydrogen (a) or represents one of the groups



in which

E represents a metal ion equivalent or an ammonium ion,

15 L represents oxygen and

M represents oxygen or sulphur,

20 R¹ very particularly preferably represents in each case optionally fluorine- or chlorine-substituted C₁-C₁₀-alkyl, C₂-C₁₀-alkenyl, C₁-C₄-alkoxy-C₁-C₂-alkyl, C₁-C₄-alkylthio-C₁-C₂-alkyl or optionally fluorine-, chlorine-, methyl-, ethyl- or methoxy-substituted C₃-C₆-cycloalkyl,

25 represents optionally fluorine-, chlorine-, bromine-, cyano-, nitro-, methyl-, methoxy-, trifluoromethyl- or trifluoromethoxy-substituted phenyl,

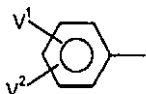
R² very particularly preferably represents in each case optionally fluorine-substituted C₁-C₁₀-alkyl, C₂-C₁₀-alkenyl or C₁-C₄-alkoxy-C₂-C₄-alkyl or

30 represents C₃-C₆-cycloalkyl,

or represents in each case optionally fluorine-, chlorine-, cyano-, nitro-, methyl-, methoxy-, trifluoromethyl- or trifluoromethoxy- substituted phenyl or benzyl.

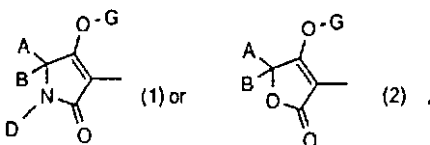
35 W especially preferably represents hydrogen, methyl, ethyl, chlorine or bromine,

- X especially preferably represents chlorine, bromine, methyl, ethyl or methoxy,
- Y especially preferably represents hydrogen, chlorine, bromine, methyl or ethyl,
- 5 Z especially preferably represents hydrogen, chlorine, bromine, methyl, or represents the radical

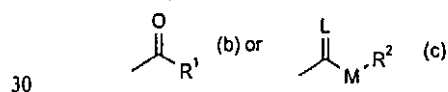


- 10 which is located in the para-position to the substituent X,
- V¹ especially preferably represents fluorine, chlorine, or trifluoromethyl,
- 15 V² especially preferably represents hydrogen, fluorine or chlorine,

CKE especially preferably represents one of the groups



- 20 A, B and the carbon atom to which they are attached especially preferably represent unsaturated C₃-C₆-cycloalkyl in which optionally one ring member is replaced by oxygen and which is optionally monosubstituted by methyl, methoxy, ethoxy, propoxy or trifluoromethyl,
- 25 D especially preferably represents hydrogen,
- G especially preferably represents hydrogen (a) or represents one of the groups



30

in which

L represents oxygen and

5 M represents oxygen or sulphur,

10 R¹ especially preferably represents C₁-C₆-alkyl, C₂-C₆-alkenyl, C₁-C₂-alkoxy-C₁-alkyl, C₁-C₂-alkylthio-C₁-alkyl or represents cyclopropyl or cyclohexyl, each of which is optionally monosubstituted by fluorine, chlorine, methyl or methoxy,

represents phenyl which is optionally monosubstituted by fluorine, chlorine, bromine, cyano, nitro, methyl, methoxy, trifluoromethyl or trifluoromethoxy,

15 R² especially preferably represents phenyl or benzyl, C₁-C₈-alkyl, C₂-C₆-alkenyl or C₁-C₄-alkoxy-C₂-C₃-alkyl, each of which is optionally mono- to trisubstituted by fluorine.

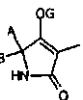
20 Emphasis is given to compounds of the formula (I) mentioned above in which the radicals are as defined below:

W especially represents hydrogen or methyl,

25 X especially represents chlorine, bromine, methyl or ethyl,

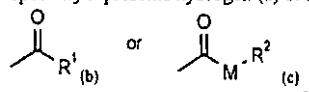
Y especially represents hydrogen, chlorine, bromine or methyl,

Z especially represents hydrogen, chlorine, bromine or methyl,

30 CKE especially represents the group  (1),

35 A, B and the carbon atom to which they are attached especially represent saturated C₆-cycloalkyl in which optionally one ring member is replaced by oxygen and which is optionally monosubstituted by methyl, trifluoromethyl, methoxy, ethoxy or propoxy,

G especially represents hydrogen (a) or represents one of the groups



in which

5

M represents oxygen or sulphur,

R¹ especially represents C₁-C₆-alkyl, C₂-C₄-alkenyl, methoxymethyl, ethoxymethyl, ethylthiomethyl, cyclopropyl, cyclopentyl, cyclohexyl or

10

represents phenyl which is optionally monosubstituted by fluorine, chlorine, bromine, methyl, methoxy, trifluoromethyl, trifluoromethoxy, cyano or nitro,

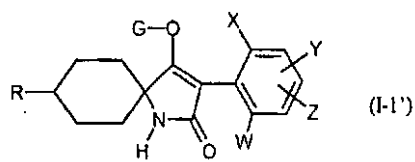
R² especially represents C₁-C₆-alkyl, C₂-C₄-alkenyl, methoxyethyl, ethoxyethyl, phenyl or benzyl,

15

in the form of their isomer mixtures or pure isomers.

Particular emphasis, as examples, is given to compounds of the formula (I-1'), in which the radicals are as defined below:

20



Example No.	W	X	Y	Z	R	G	known from
I-1'-1	CH ₃	C ₂ H ₅	4-Br	H	OCH ₃	H	WO 97/02243; I-1-a-40
I-1'-2	H	Br	H	5-CH ₃	OCH ₃	CO-i-C ₃ H ₇	WO 98/05638; I-1-b-33
I-1'-3	H	Br	H	5-CH ₃	OCH ₃	CO ₂ -C ₂ H ₅	WO 98/05638; I-1-c-22
I-1'-4	H	CH ₃	H	5-CH ₃	OCH ₃	H	WO 98/05638; I-1-a-4 WO 04/007448; I-a-1
I-1'-5	H	CH ₃	H	5-CH ₃	OCH ₃	CO ₂ -C ₂ H ₅	WO 98/05638; I-1-c-4 WO 04/007448; I-c-1
I-1'-6	CH ₃	CH ₃	H	3-Br	OCH ₃	H	WO 97/36868; I-1-a-17
I-1'-7	CH ₃	CH ₃	H	3-Cl	OCH ₃	H	WO 97/36868; I-1-a-2
I-1'-8	H	Br	4-CH ₃	5-CH ₃	OCH ₃	CO-i-C ₃ H ₇	WO 97/01535; I-1-b-54
I-1'-9	H	CH ₃	4-Cl	5-CH ₃	OCH ₃	CO ₂ -C ₂ H ₅	WO 97/01535; I-1-c-18
I-1'-10	CH ₃	CH ₃	4-CH ₃	3-CH ₃	OCH ₃	H	WO 97/36868; I-1-a-4
I-1'-11	CH ₃	CH ₃	H	3-Br	OC ₂ H ₅	CO-i-C ₃ H ₇	WO 01/89300; I-10
I-1'-12	H	CH ₃	4-CH ₃	5-CH ₃	OC ₂ H ₅	CO-n-C ₃ H ₇	WO 97/01535; I-1-b-25
I-1'-13	H	CH ₃	4-CH ₃	5-CH ₃	OC ₂ H ₅	CO-i-C ₃ H ₇	WO 97/01535; I-1-b-22
I-1'-14	H	CH ₃	4-CH ₃	5-CH ₃	OC ₂ H ₅	CO-c-C ₃ H ₅	WO 97/01535; I-1-b-34

The general or preferred radical definitions or illustrations given above can be combined with one another as desired, i.e. including combinations between the respective ranges and preferred ranges.

- 5 Preference according to the invention is given to the use of the compounds of the formula (I) which contain a combination of the meanings given above as being preferred (preferable).

- 10 Particular preference according to the invention is given to the use of the compounds of the formula (I) which contain a combination of the meanings given above as being particularly preferred.

- 15 Very particular preference according to the invention is given to the use of the compounds of the formula (I) which contain a combination of the meanings given above as being very particularly preferred.

- 20 Especial preference according to the invention is given to the use of the compounds of the formula (I) which contain a combination of the meanings given above as being especially preferred.

Emphasis is given, according to the invention, to the use of the compounds of the formula (I) which contain a combination of the meanings given above as being especial.

- 25 Saturated or unsaturated hydrocarbon radicals such as alkyl or alkenyl can, as far as this is possible, in each case be straight-chain or branched, including in combination with heteroatoms, such as, for example, in alkoxy.

- 30 Unless indicated otherwise, optionally substituted radicals can be mono- or polysubstituted, where in the case of polysubstitution, the substituents can be identical or different.

- 35 In addition to the compounds mentioned in the examples, the following compounds of the formula (I-1-a) may be specifically mentioned:

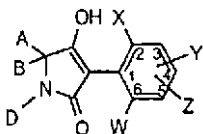


Table 1: W = CH₃, X = CH₃, Y = 4-CH₃, Z = H.

A	B	D
CH ₃	CH ₃	H
C ₂ H ₅	CH ₃	H
C ₃ H ₇	CH ₃	H
i-C ₃ H ₇	CH ₃	H
△	CH ₃	H
-(CH ₂) ₄		H
-(CH ₂) ₅		H
-(CH ₂) ₂ -O-(CH ₂) ₂		H
-CH ₂ -O-(CH ₂) ₃		H
-CH ₂ -CHCH ₃ -(CH ₂) ₃		H
-(CH ₂) ₂ -CHCH ₃ -(CH ₂) ₂		H
-(CH ₂) ₂ -CHOCH ₃ -(CH ₂) ₂		H
-(CH ₂) ₂ -CHOC ₂ H ₅ -(CH ₂) ₂		H
-(CH ₂) ₂ -C(CH ₃) ₂ -(CH ₂) ₂		H

5

Table 2: A, B and D are as indicated in Table 1
W = CH₃; X = CH₃; Y = 4-Cl; Z = H.

Table 3: A, B and D are as indicated in Table 1
W = CH₃; X = CH₃; Y = 4-Br; Z = H.

10

Table 4: A, B and D are as indicated in Table 1
W = C₂H₅; X = CH₃; Y = 4-Cl; Z = H.

Table 5: A, B and D are as indicated in Table 1
W = C₂H₅; X = CH₃; Y = 4-Br; Z = H.

15

Table 6: A, B and D are as indicated in Table 1
W = C₂H₅; X = C₂H₅; Y = 4-Cl; Z = H.

	Table 7:	A, B and D are as indicated in Table 1 W = C ₂ H ₅ ; X = C ₂ H ₅ ; Y = 4-Br; Z = H.
5	Table 8:	A, B and D are as indicated in Table 1 W = CH ₃ ; X = Cl; Y = 4-Cl; Z = H.
	Table 9:	A, B and D are as indicated in Table 1 W = CH ₃ ; X = Br; Y = 4-Br; Z = H.
10	Table 10:	A, B and D are as indicated in Table 1 W = CH ₃ ; X = Cl; Y = 4-Br; Z = H.
	Table 11:	A, B and D are as indicated in Table 1 W = CH ₃ ; X = Br; Y = 4-Cl; Z = H.
15	Table 12:	A, B and D are as indicated in Table 1 W = C ₂ H ₅ ; X = Cl; Y = 4-Cl; Z = H.
	Table 13:	A, B and D are as indicated in Table 1 W = C ₂ H ₅ ; X = Br; Y = 4-Br; Z = H.
20	Table 14:	A, B and D are as indicated in Table 1 W = C ₂ H ₅ ; X = Cl; Y = 4-Br; Z = H.
	Table 15:	A, B and D are as indicated in Table 1 W = C ₂ H ₅ ; X = Br; Y = 4-Cl; Z = H.
25	Table 16:	A, B and D are as indicated in Table 1 W = H; X = Cl; Y = H; Z = H.
	Table 17:	A, B and D are as indicated in Table 1 W = H; X = Br; Y = H; Z = H.
30	Table 18:	A, B and D are as indicated in Table 1 W = H; X = CH ₃ ; Y = H; Z = H.
	Table 19:	A, B and D are as indicated in Table 1

W = H; X = CF₃; Y = H; Z = H.

	Table 20:	A, B and D are as indicated in Table 1 W = H; X = CH ₃ ; Y = 4-Cl; Z = H.
5	Table 21:	A, B and D are as indicated in Table 1 W = H; X = Cl; Y = 4-CH ₃ ; Z = H.
10	Table 22:	A, B and D are as indicated in Table 1 W = H; X = CH ₃ ; Y = 4-Br; Z = H.
	Table 23:	A, B and D are as indicated in Table 1 W = H; X = Br; Y = 4-CH ₃ ; Z = H.
15	Table 24:	A, B and D are as indicated in Table 1 W = H; X = Cl; Y = 4-Cl; Z = H.
	Table 25:	A, B and D are as indicated in Table 1 W = H; X = Cl; Y = 4-Br; Z = H.
20	Table 26:	A, B and D are as indicated in Table 1 W = H; X = Br; Y = 4-Cl; Z = H.
25	Table 27:	A, B and D are as indicated in Table 1 W = CH ₃ ; X = Cl; Y = 4-CH ₃ ; Z = H.
	Table 28:	A, B and D are as indicated in Table 1 W = CH ₃ ; X = Br; Y = 4-CH ₃ ; Z = H.
30	Table 29:	A, B and D are as indicated in Table 1 W = C ₂ H ₅ ; X = Cl; Y = 4-CH ₃ ; Z = H.
	Table 30:	A, B and D are as indicated in Table 1 W = C ₂ H ₅ ; X = Br; Y = 4-CH ₃ ; Z = H.
35	Table 31:	A, B and D are as indicated in Table 1 W = C ₂ H ₅ ; X = CH ₃ ; Y = 4-CH ₃ ; Z = H.

	Table 32:	A, B and D are as indicated in Table 1 W = C ₂ H ₅ ; X = C ₂ H ₅ ; Y = 4-CH ₃ ; Z = H.
5	Table 33:	A, B and D are as indicated in Table 1 W = C ₂ H ₅ ; X = C ₂ H ₅ ; Y = 4-C ₂ H ₅ ; Z = H.
	Table 34:	A, B and D are as indicated in Table 1 W = H; X = CH ₃ ; Y = 4-CH ₃ ; Z = 5-CH ₃ .
10	Table 35:	A, B and D are as indicated in Table 1 W = H; X = CH ₃ ; Y = 4-Cl; Z = 5-CH ₃ .
	Table 36:	A, B and D are as indicated in Table 1 W = H; X = Br; Y = 4-CH ₃ ; Z = 5-CH ₃ .
15	Table 37:	A, B and D are as indicated in Table 1 W = H; X = Cl; Y = 4-Cl; Z = 5-CH ₃ .
	Table 38:	A, B and D are as indicated in Table 1 W = H; X = CH ₃ ; Y = 4-Br; Z = 5-CH ₃ .
20	Table 39:	A, B and D are as indicated in Table 1 W = H; X = Cl; Y = 4-CH ₃ ; Z = 5-Cl.
	Table 40:	A, B and D are as indicated in Table 1 W = H; X = CH ₃ ; Y = H; Z = 5-CH ₃ .
	Table 41:	A, B and D are as indicated in Table 1 W = H; X = Cl; Y = H; Z = 5-CH ₃ .
30	Table 42:	A, B and D are as indicated in Table 1 W = H; X = Br; Y = H; Z = 5-CH ₃ .
	Table 43:	A, B and D are as indicated in Table 1 W = CH ₃ ; X = CH ₃ ; Y = 4-CH ₃ ; Z = 3-CH ₃ .
35	Table 44:	A, B and D are as indicated in Table 1 W = CH ₃ ; X = CH ₃ ; Y = H; Z = 3-Br.

Table 45: A, B and D are as indicated in Table 1
W = CH₃; X = CH₃; Y = 4-CH₃; Z = 3-Cl.

Table 46: A, B and D are as indicated in Table 1
W = CH₃; X = CH₃; Y = 4-CH₃; Z = 3-Br.

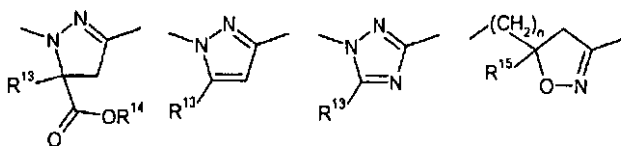
Table 47: A, B and D are as indicated in Table 1
W = CH₃; X = CH₃; Y = H; Z = 3-Cl.

- 10 The compounds of the formula (I) are known in principle from the patent specifications mentioned at the outset, or they may be prepared according to the methods described therein.

- 15 Preferred meanings of the groups listed above in connection with the crop plant compatibility-improving compounds ("insecticide and acaricide safeners") of the formulae (IIa), (IIb), (IIc), (IIe) and (Ile) are defined below.

m preferably represents the number 0, 1, 2, 3 or 4,

- 20 A¹ preferably represents one of the divalent heterocyclic groupings shown below



n preferably represents the number 0, 1, 2, 3 or 4,

- 25 A² preferably represents in each case optionally methyl-, ethyl-, methoxycarbonyl-, ethoxycarbonyl- or allyloxycarbonyl-substituted methylene or ethylene,

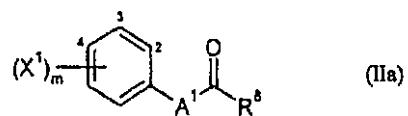
- 30 R⁸ preferably represents hydroxyl, mercapto, amino, methoxy, ethoxy, n- or i-propoxy, n-, i-, s- or t-butoxy, methylthio, ethylthio, n- or i-propylthio, n-, i-, s- or t-butylthio, methylamino, ethylamino, n- or i-propylamino, n-, i-, s- or t-butylamino, dimethylamino or diethylamino,

- 5 R^9 preferably represents hydroxyl, mercapto, amino, methoxy, ethoxy, n- or i-propoxy, n-, i-, s- or t-butoxy, 1-methylhexyloxy, allyloxy, 1-allyloxymethylethoxy, methylthio, ethylthio, n- or i-propylthio, n-, i-, s- or t-butylthio, methylamino, ethylamino, n- or i-propylamino, n-, i-, s- or t-butylamino, dimethylamino or diethylamino,
- 10 R^{10} preferably represents in each case optionally fluorine-, chlorine- and/or bromine-substituted methyl, ethyl, n- or i-propyl,
- 15 R^{11} preferably represents hydrogen, in each case optionally fluorine- and/or chlorine-substituted methyl, ethyl, n- or i-propyl, n-, i-, s- or t-butyl, propenyl, butenyl, propynyl or butynyl, methoxymethyl, ethoxymethyl, methoxyethyl, ethoxyethyl, dioxolanymethyl, furyl, furylmethyl, thienyl, thiazolyl, piperidinyl, or optionally fluorine-, chlorine-, methyl-, ethyl-, n- or i-propyl-, n-, i-, s- or t-butyl-substituted phenyl,
- 20 R^{12} preferably represents hydrogen, in each case optionally fluorine- and/or chlorine-substituted methyl, ethyl, n- or i-propyl, n-, i-, s- or t-butyl, propenyl, butenyl, propynyl or butynyl, methoxymethyl, ethoxymethyl, methoxyethyl, ethoxyethyl, dioxolanymethyl, furyl, furylmethyl, thienyl, thiazolyl, piperidinyl, or optionally fluorine-, chlorine-, methyl-, ethyl-, n- or i-propyl-, n-, i-, s- or t-butyl-substituted phenyl, or together with R^{11} represents one of the radicals
- 25 $-CH_2-O-CH_2-CH_2-$ and $-CH_2-CH_2-O-CH_2-CH_2-$, which are optionally substituted by methyl, ethyl, furyl, phenyl, a fused-on benzene ring or by two substituents which together with the C atom to which they are attached form a 5- or 6-membered carbocycle,
- 30 R^{13} preferably represents hydrogen, cyano, fluorine, chlorine, bromine, or represents in each case optionally fluorine-, chlorine- and/or bromine-substituted methyl, ethyl, n- or i-propyl, cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl or phenyl,
- 35 R^{14} preferably represents hydrogen, optionally hydroxyl-, cyano-, fluorine-, chlorine-, methoxy-, ethoxy-, n- or i-propoxy-substituted methyl, ethyl, n- or i-propyl, n-, i-, s- or t-butyl,
- R^{15} preferably represents hydrogen, cyano, fluorine, chlorine, bromine, or represents in each case optionally fluorine-, chlorine- and/or bromine-substituted methyl,

- 5 R^{19} preferably represents hydrogen, in each case optionally cyano-, hydroxyl-, fluorine-, chlorine-, methoxy-, ethoxy-, n- or i-propoxy-substituted methyl, ethyl, n- or i-propyl, n-, i- or s-butyl, in each case optionally cyano-, fluorine-, chlorine- or bromine-substituted propenyl, butenyl, propynyl or butynyl, or in each case optionally cyano-, fluorine-, chlorine-, bromine-, methyl-, ethyl-, n- or i-propyl-substituted cyclopropyl, cyclobutyl, cyclopentyl or cyclohexyl,
- 10 R^{20} preferably represents hydrogen, in each case optionally cyano-, hydroxyl-, fluorine-, chlorine-, methoxy-, ethoxy-, n- or i-propoxy-substituted methyl, ethyl, n- or i-propyl, n-, i- or s-butyl, in each case optionally cyano-, fluorine-, chlorine- or bromine-substituted propenyl, butenyl, propynyl or butynyl, in each case optionally cyano-, fluorine-, chlorine-, bromine-, methyl-, ethyl-, n- or i-propyl-substituted cyclopropyl, cyclobutyl, cyclopentyl or cyclohexyl, or optionally nitro-, cyano-, fluorine-, chlorine-, bromine-, methyl-, ethyl-, n- or i-propyl-, n-, i-, s- or t-butyl-, trifluoromethyl-, methoxy-, ethoxy-, n- or i-propoxy-, difluoromethoxy- or trifluoromethoxy-substituted phenyl, or together with R^{19} represents in each case optionally methyl- or ethyl-substituted butane-1,4-diyl (trimethylene), pentane-1,5-diyl, 1-oxa-butane-1,4-diyl or 3-oxa-pentane-1,5-diyl,
- 20 X^4 preferably represents nitro, cyano, carboxyl, carbamoyl, formyl, sulphonoyl, hydroxyl, amino, fluorine, chlorine, bromine, methyl, ethyl, n- or i-propyl, n-, i-, s- or t-butyl, trifluoromethyl, methoxy, ethoxy, n- or i-propoxy, difluoromethoxy or trifluoromethoxy,
- 25 X^5 preferably represents nitro, cyano, carboxyl, carbamoyl, formyl, sulphonoyl, hydroxyl, amino, fluorine, chlorine, bromine, methyl, ethyl, n- or i-propyl, n-, i-, s- or t-butyl, trifluoromethyl, methoxy, ethoxy, n- or i-propoxy, difluoromethoxy or trifluoromethoxy,
- 30

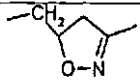
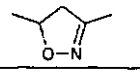
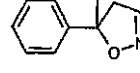
Examples of compounds of the formula (IIa) which are very particularly preferred as insecticide and acaricide safeners according to the invention are listed in the table below.

Table Examples of the compounds of the formula (IIa)

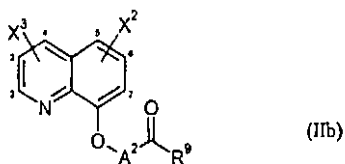


Example No.	(Positions) (X¹) _m	A¹	R⁵
IIa-1	(2) Cl, (4) Cl		OCH₃
IIa-2	(2) Cl, (4) Cl		OCH₃
IIa-3	(2) Cl, (4) Cl		OC₂H₅
IIa-4	(2) Cl, (4) Cl		OC₂H₅
IIa-5	(2) Cl		OCH₃
IIa-6	(2) Cl, (4) Cl		OCH₃

Example No.	(Positions) (X ¹) _m	A ¹	R ⁸
IIa-7	(2) F		OCH ₃
IIa-8	(2) F		OCH ₃
IIa-9	(2) Cl, (4) Cl		OC ₂ H ₅
IIa-10	(2) Cl, (4) CF ₃		OCH ₃
IIa-11	(2) Cl		OCH ₃
IIa-12	-		OC ₂ H ₅
IIa-13	(2) Cl, (4) Cl		OC ₂ H ₅
IIa-14	(2) Cl, (4) Cl		OC ₂ H ₅
IIa-15	(2) Cl, (4) Cl		OC ₂ H ₅

Example No.	(Positions) (X ¹) _m	A ¹	R ⁸
IIa-16	(2) Cl, (4) Cl		OC ₂ H ₅
IIa-17	(2) Cl, (4) Cl		OC ₂ H ₅
IIa-18	-		OH

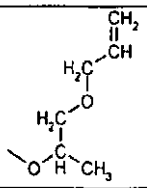
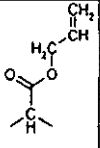
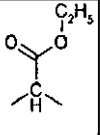
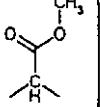
Examples of compounds of the formula (IIb) which are very particularly preferred as insecticide and acaricide safeners according to the invention are listed in the table below.



5

Table Examples of the compounds of the formula (IIb)

Example No.	(Position) X ²	(Position) X ³	A ²	R ⁹
IIb-1	(5) Cl	-	CH ₂	OH
IIb-2	(5) Cl	-	CH ₂	OCH ₃
IIb-3	(5) Cl	-	CH ₂	OC ₂ H ₅
IIb-4	(5) Cl	-	CH ₂	OC ₃ H _{7-n}
IIb-5	(5) Cl	-	CH ₂	OC ₃ H _{7-i}
IIb-6	(5) Cl	-	CH ₂	OC ₄ H _{9-n}
IIb-7	(5) Cl	-	CH ₂	OCH(CH ₃)C ₃ H _{11-n}

Example No.	(Position) X ¹	(Position) X ³	A ²	R ⁹
IIb-8	(5) Cl	(2) F	CH ₂	OH
IIb-9	(5) Cl	(2) Cl	CH ₂	OH
IIb-10	(5) Cl	-	CH ₂	OCH ₂ CH=CH ₂
IIb-11	(5) Cl	-	CH ₂	OC ₄ H ₉ -i
IIb-12	(5) Cl	-	CH ₂	
IIb-13	(5) Cl	-		OCH ₂ CH=CH ₂
IIb-14	(5) Cl	-		OC ₂ H ₅
IIb-15	(5) Cl	-		OCH ₃

Examples of the compounds of the formula (IIc) which are very particularly preferred as insecticide and acaricide safeners according to the invention are listed in the table below.

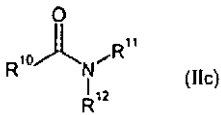
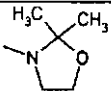
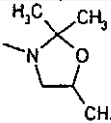
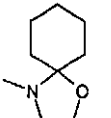
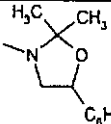
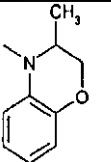
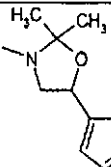


Table Examples of the compounds of the formula (IIc)

Example No.	R ¹⁰	N(R ¹¹ , R ¹²)
IIc-1	CHCl ₂	N(CH ₂ CH=CH ₂) ₂
IIc-2	CHCl ₂	
IIc-3	CHCl ₂	
IIc-4	CHCl ₂	
IIc-5	CHCl ₂	
IIc-6	CHCl ₂	
IIc-7	CHCl ₂	

5 Examples of the compounds of the formula (IIc) which are very particularly preferred as insecticide and acaricide safeners according to the invention are listed in the table below.

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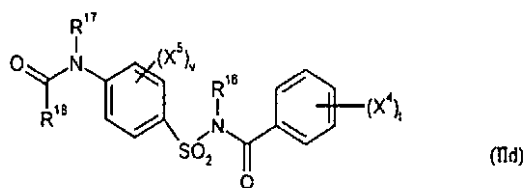
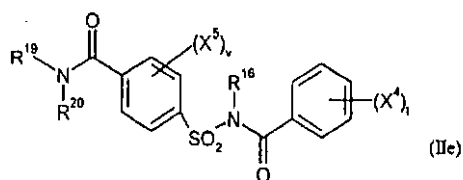


Table Examples of the compounds of the formula (IId)

Example No.	R ¹⁶	R ¹⁷	R ¹⁸	(Positions) (X ⁴) _t	(Positions) (X ⁵) _u
IId-1	H	H	CH ₃	(2) OCH ₃	-
IId-2	H	H	C ₂ H ₅	(2) OCH ₃	-
IId-3	H	H	C ₃ H _{7-n}	(2) OCH ₃	-
IId-4	H	H	C ₃ H _{7-i}	(2) OCH ₃	-
IId-5	H	H		(2) OCH ₃	-
IId-6	H	H	CH ₃	(2) OCH ₃ (5) CH ₃	-
IId-7	H	H	C ₂ H ₅	(2) OCH ₃ (5) CH ₃	-
IId-8	H	H	C ₃ H _{7-n}	(2) OCH ₃ (5) CH ₃	-
IId-9	H	H	C ₃ H _{7-i}	(2) OCH ₃ (5) CH ₃	-
IId-10	H	H		(2) OCH ₃ (5) CH ₃	-
IId-11	H	H	OCH ₃	(2) OCH ₃ (5) CH ₃	-
IId-12	H	H	OC ₂ H ₅	(2) OCH ₃ (5) CH ₃	-
IId-13	H	H	OC ₃ H _{7-i}	(2) OCH ₃ (5) CH ₃	-
IId-14	H	H	SCH ₃	(2) OCH ₃ (5) CH ₃	-
IId-15	H	H	SC ₂ H ₅	(2) OCH ₃ (5) CH ₃	-

Example No.	R ¹⁶	R ¹⁷	R ¹⁸	(Positions) (X ⁴) ₁	(Positions) (X ⁵) _v
IId-16	H	H	SC ₃ H _{7-i}	(2) OCH ₃ (5) CH ₃	-
IId-17	H	H	NHCH ₃	(2) OCH ₃ (5) CH ₃	-
IId-18	H	H	NHC ₂ H ₅	(2) OCH ₃ (5) CH ₃	-
IId-19	H	H	NHC ₃ H _{7-i}	(2) OCH ₃ (5) CH ₃	-
IId-20	H	H		(2) OCH ₃ (5) CH ₃	-
IId-21	H	H	NHCH ₃	(2) OCH ₃	-
IId-22	H	H	NHC ₃ H _{7-i}	(2) OCH ₃	-
IId-23	H	H	N(CH ₃) ₂	(2) OCH ₃	-
IId-24	H	H	N(CH ₃) ₂	(3) CH ₃ (4) CH ₃	-
IId-25	H	H	CH ₂ -O-CH ₃	(2) OCH ₃	-

Examples of the compounds of the formula (Ile) which are very particularly preferred as insecticide and acaricide safeners according to the invention are listed in the table below.



5)

Table Examples of the compounds of the formula (Ile)

Example No.	R ¹⁶	R ¹⁹	R ²⁰	(Positions) (X ⁴) ₁	(Positions) (X ⁵) _v
Ile-1	H	H	CH ₃	(2) OCH ₃	-
Ile-2	H	H	C ₂ H ₅	(2) OCH ₃	-
Ile-3	H	H	C ₃ H _{7-n}	(2) OCH ₃	-
Ile-4	H	H	C ₃ H _{7-i}	(2) OCH ₃	-

Example No.	R ¹⁶	R ¹⁹	R ²⁰	(Positions) (X ⁴) ₁	(Positions) (X ⁵) ₂
Ile-5	H	H		(2) OCH ₃	-
Ile-6	H	CH ₃	CH ₃	(2) OCH ₃	-
Ile-7	H	H	CH ₃	(2) OCH ₃ (5) CH ₃	-
Ile-8	H	H	C ₂ H ₅	(2) OCH ₃ (5) CH ₃	-
Ile-9	H	H	C ₃ H _{7-n}	(2) OCH ₃ (5) CH ₃	-
Ile-10	H	H	C ₃ H _{7-i}	(2) OCH ₃ (5) CH ₃	-
Ile-11	H	H		(2) OCH ₃ (5) CH ₃	-
Ile-12	H	CH ₃	CH ₃	(2) OCH ₃ (5) CH ₃	-

Most preferred compounds which improve crop plant compatibility [component (b)] are cloquintocet-mexyl, fenchlorazol-ethyl, isoxadifen-ethyl, mefenpyr-diethyl, furilazole, fenclorim, cumyluron, dymron, dichlormid, dimepiperate and the compounds Ile-5 and Ile-11 and particular emphasis is given to cloquintocet-mexyl, isoxadifen-ethyl, mefenpyr-diethyl, furilazole, dichlormid, fenclorim and Ile-5.

Examples of the selectively insecticidal and/or acaricidal I combinations according to the invention of in each case one active compound of the formula (I) and in each case one of the safeners defined above are listed in the table below.

Table Examples of the combinations according to the invention

Active compound of the formula (I)	Safener
I-1	cloquintocet-mexyl
I-1	fenchlorazole-ethyl
I-1	isoxadifen-ethyl
I-1	mefenpyr-diethyl

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Active compound of the formula (I)	Safener
I-1	furilazole
I-1	fenclorim
I-1	cumyluron
I-1	daimuron /dymron
I-1	dimepiperate
I-1	Ile-11
I-1	Ile-5
I-1	dichlorimid
I-2	cloquintocet-mexyl
I-2	fenchlorazole-ethyl
I-2	isoxadifen-ethyl
I-2	mefenpyr-diethyl
I-2	furilazole
I-2	fenclorim
I-2	cumyluron
I-2	daimuron /dymron
I-2	dimepiperate
I-2	Ile-11
I-2	Ile-5
I-2	dichlorimid
I-3	cloquintocet-mexyl
I-3	fenchlorazole-ethyl
I-3	isoxadifen-ethyl
I-3	mefenpyr-diethyl
I-3	furilazole
I-3	fenclorim
I-3	cumyluron
I-3	daimuron /dymron
I-3	dimepiperate
I-3	Ile-5
I-3	Ile-11
I-3	dichlorimid
I-4	cloquintocet-mexyl
I-4	fenchlorazole-ethyl
I-4	isoxadifen-ethyl

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Active compound of the formula (I)	Safener
I-4	mefenpyr-diethyl
I-4	furilazole
I-4	fenclorim
I-4	cumyluron
I-4	daimuron /dymron
I-4	dimepiperate
I-4	Ile-11
I-4	Ile-5
I-4	dichlormid
I-5	cloquintocet-mexyl
I-5	fenchlorazole-ethyl
I-5	isoxadifen-ethyl
I-5	mefenpyr-diethyl
I-5	furilazole
I-5	fenclorim
I-5	cumyluron
I-5	daimuron /dymron
I-5	dimepiperate
I-5	Ile-5
I-5	Ile-11
I-5	dichlormid
I-6	cloquintocet-mexyl
I-6	fenchlorazole-ethyl
I-6	isoxadifen-ethyl
I-6	mefenpyr-diethyl
I-6	furilazole
I-6	fenclorim
I-6	cumyluron
I-6	daimuron /dymron
I-6	dimepiperate
I-6	Ile-5
I-6	Ile-11
I-6	dichlormid

The compounds of the general formula (IIa) to be used as safeners are known and/or can be prepared by processes known per se (cf. WO-A-91/07874, WO-A-95/07897).

5 The compounds of the general formula (IIb) to be used as safeners are known and/or can be prepared by processes known per se (cf. EP-A-191736).

The compounds of the general formula (IIc) to be used as safeners are known and/or can be prepared by processes known per se (cf. DE-A-2218097, DE-A-2350547).

10 The compounds of the general formula (IId) to be used as safeners are known and/or can be prepared by processes known per se (cf. DE-A-19621522/US-A-6235680).

The compounds of the general formula (IIe) to be used as safeners are known and/or can be prepared by processes known per se (cf. WO-A-99/66795/US-A-6251827).

15 Surprisingly, it has now been found that the above-defined active compound combinations of substituted ketonols of the general formula (I) and safeners (antidotes) of group (b) listed above, whilst being tolerated very well by useful plants, have good insecticidal and/or acaricidal activity and can be used in various crops, in particular in cereals (especially wheat and barley), but also in millet, maize and rice, for
20 the selective control of insects.

Here, it has to be considered to be surprising that, from a large number of known safeners or antidotes which are capable of antagonizing the damaging effect of a
25 herbicide on the crop plants, it is in particular the abovementioned compounds of group (b) which are suitable for neutralizing the damaging effect of substituted cyclic ketonols of the formula (I) on the crop plants virtually completely without negatively affecting the insecticidal and/or acaricidal activity.

30 Furthermore, it has to be considered to be completely surprising that compounds from group (b) listed above are not only capable of virtually completely neutralizing the damaging effect of substituted cyclic ketonols of the formula (I) on the crop plants but in some cases even enhance the insecticidal and/or acaricidal activity of the substituted cyclic ketonols of the formula (I), so that a synergistic effect can be
35 observed.

Emphasis is given here to the particularly advantageous effect of the particularly and most preferred combination partners from group (b), in particular in respect of

sparing cereal plants, such as, for example, wheat, barley and rye, but also millet, maize and rice, as crop plants.

5 The combinations of active compounds can be used, for example, for the following plants:

Dicotyledonous crops of the genera: Gossypium, Glycine, Beta, Daucus, Phaseolus, Pisum, Solanum, Linum, Ipomoea, Vicia, Nicotiana, Lycopersicon, Arachis, Brassica, Lactuca, Cucumis, Cuburbita, Helianthus.

10

Monocotyledonous crops of the genera: Oryza, Zea, Triticum, Hordeum, Avena, Secale, Sorghum, Panicum, Saccharum, Ananas, Asparagus, Allium.

15 However, the use of the combinations of active compounds is by no means limited to these genera but equally also extends to other plants.

20 The advantageous effect of the combinations of active compounds is particularly strongly pronounced at certain concentration ratios. However, the weight ratios of the active compounds in the combinations of active compounds can be varied within relatively wide ranges. In general, 0.001 to 1000 parts by weight, preferably 0.01 to 100 parts by weight, particularly preferably 0.05 to 10 parts by weight and most preferably 0.07 to 1.5 parts by weight of one of the crop plant compatibility-improving compounds (antidotes/safeners) mentioned above under (b) are present per part by weight of active compound of the formula (I) or salts thereof.

25

The active compounds or active compound combinations can be converted into the customary formulations, such as solutions, emulsions, wettable powders, suspensions, powders, dusts, pastes, soluble powders, granules, suspoemulsion concentrates, natural and synthetic materials impregnated with active compound and microencapsulations in polymeric materials.

30

35 These formulations are produced in a known manner, for example by mixing the active compounds with extenders, that is, liquid solvents and/or solid carriers, optionally with the use of surface-active agents, that is, emulsifiers and/or dispersants and/or foam formers.

If the extender used is water, it is also possible to use for example organic solvents as auxiliary solvents. Suitable liquid solvents are mainly: aromatics, such as xylene,

toluene or alkylnaphthalenes, chlorinated aromatics 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 ethers
 5 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 water.

Suitable solid carriers are:

10 for example ammonium salts and ground natural minerals, such as kaolins, clays, talc, chalk, quartz, attapulgite, montmorillonite or diatomaceous earth, and ground synthetic minerals, such as finely divided silica, alumina and silicates; suitable as solid carriers for granules are: for example crushed and fractionated natural rocks
 15 such as calcite, marble, pumice, sepiolite and dolomite, and synthetic granules of inorganic and organic meals, and granules of organic material such as sawdust, coconut shells, maize cobs and tobacco stalks; suitable as emulsifiers and/or foam formers are: for example nonionic and anionic emulsifiers, such as polyoxyethylene fatty acid esters, polyoxyethylene fatty alcohol ethers, for example alkylaryl
 20 polyglycol ethers, alkylsulphonates, alkyl sulphates, arylsulphonates and protein hydrolysates; suitable as dispersants are: for example lignosulphite waste liquors and methylcellulose.

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

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

35 The formulations in general comprise between 0.1 and 95% by weight of active compounds, including the active compounds with a safening effect, preferably between 0.5 and 90%.

The combinations of active compounds are generally applied in the form of ready-to-use formulations. However, the active compounds contained in the combinations of active compounds may also be applied in the form of individual formulations which are mixed upon use, that is, in the form of tank mixes.

5

The combinations of active compounds, as such or in their formulations, may furthermore also be used as a mixture with other known herbicides, again with ready-to-use formulations or tank mixes being possible. A mixture with other known active compounds, such as fungicides, insecticides, acaricides, nematocides, attractants, sterilants, bactericides, bird repellents, growth substances, plant nutrients and soil conditioners is also possible. It may furthermore be advantageous for specific applications, in particular for the post-emergence method, to incorporate into the formulations plant-compatible mineral or vegetable oils (for example the commercial product "Rako Binol") or ammonium salts, such as, for example, ammonium sulphate or ammonium thiocyanate, as further additives.

10

15

The combinations of active compounds can be used as such, in the form of their formulations or the use forms which are prepared from these formulations by further dilution, such as ready-to-use solutions, suspensions, emulsions, powders, pastes and granules. Application is effected in the customary manner, for example by watering, spraying, atomizing, dusting or broadcasting.

20

The application rates of the combinations of active compound can be varied within a certain range; they depend inter alia on the weather and on the soil factors. In general, the application rates are between 0.005 and 5 kg per ha, preferably between 0.01 and 2 kg per ha, particularly preferably between 0.05 and 1.0 kg per ha.

25

The combinations of active compounds can be applied before and after emergence of the plants, i.e. by the pre-emergence and the post-emergence method.

30

Depending on their properties, the safeners to be used can be employed for pretreating the seed of the crop plant (seed dressing) or be incorporated into the seed furrows before sowing or, together with the herbicide, be applied before or after emergence of the plants.

35

The combinations of active compounds are suitable for controlling animal pests, preferably arthropods and nematodes, in particular insects and arachnids, encountered in agriculture, in animal healthcare, in forests, in the protection of stored products

and in the protection of materials, and also in the hygiene sector. They are effective against normally sensitive and resistant species and against all or individual stages of development. The abovementioned pests include:

- 5 From the order of the Isopoda, for example, *Oniscus asellus*, *Armadillidium vulgare*, *Porcellio scaber*.

From the order of the Diplopoda, for example, *Blaniulus guttulatus*.

- 10 From the order of the Chilopoda, for example, *Geophilus carpophagus*, *Scutigera* spp..

From the order of the Symphyla, for example, *Scutigera* spp..

- 15 From the order of the Thysanura, for example, *Lepisma saccharina*.

From the order of the Collembola, for example, *Onychiurus asseionus*.

From the order of the Orthoptera, for example, *Acheta domesticus*, *Grylotalpa* spp.,

- 20 *Locusta migratoria migratorioides*, *Melanoplus* spp., *Schistocerca gregaria*.

From the order of the Blattaria, for example, *Blatta orientalis*, *Periplaneta americana*, *Leucophaea maderae*, *Blattella germanica*.

- 25 From the order of the Dermaptera, for example, *Forficula auricularia*.

From the order of the Isoptera, for example, *Reticulitermes* spp..

From the order of the Phthiraptera, for example, *Pediculus humanus corporis*,

- 30 *Haematopinus* spp., *Linognathus* spp., *Trichodectes* spp., *Damalinia* spp..

From the order of the Thysanoptera, for example, *Hemiothrips femoralis*, *Thrips tabaci*, *Thrips palmi*, *Frankliniella occidentalis*.

- 35 From the order of the Heteroptera, for example, *Eurygaster* spp., *Dysdercus intermedius*, *Piesma quadrata*, *Cimex lectularius*, *Rhodnius prolixus*, *Triatoma* spp..

From the order of the Homoptera, for example, *Aleurodes brassicae*, *Bemisia tabaci*, *Trialeurodes vaporariorum*, *Aphis gossypii*, *Brevicoryne brassicae*, *Cryptomyzus ribis*, *Aphis fabae*, *Aphis pomi*, *Eriosoma lanigerum*, *Hyalopterus arundinis*, *Phylloxera vastatrix*, *Pemphigus* spp., *Macrosiphum avenae*, *Myzus* spp., *Phorodon*
 5 *humuli*, *Rhopalosiphum padi*, *Empoasca* spp., *Euscelis bilobatus*, *Nephotettix cincticeps*, *Lecanium corni*, *Saissetia oleae*, *Laodelphax striatellus*, *Nilaparvata lugens*, *Aonidiella aurantii*, *Aspidiotus hederae*, *Pseudococcus* spp., *Psylla* spp..

From the order of the Lepidoptera, for example, *Pectinophora gossypiella*, *Bupalus*
 10 *pinarius*, *Cheimatobia brumata*, *Lithocolletis blancardella*, *Hyponomeuta padella*, *Plutella xylostella*, *Malacosoma neustria*, *Euproctis chrysorrhoea*, *Lymantria* spp., *Bucculatrix thurberiella*, *Phyllocnistis citrella*, *Agrotis* spp., *Euxoa* spp., *Feltia* spp., *Earias insulana*, *Heliothis* spp., *Mamestra brassicae*, *Panolis flammea*, *Spodoptera* spp., *Trichoplusia ni*, *Carpocapsa pomonella*, *Pieris* spp., *Chilo* spp., *Pyrausta*
 15 *nubilalis*, *Ephestia kuehniella*, *Galleria mellonella*, *Tineola bisselliella*, *Tinea pellionella*, *Hofmannophila pseudospretella*, *Cacoecia podana*, *Capua reticulana*, *Choristoneura fumiferana*, *Clysia ambiguella*, *Homona magnanima*, *Tortrix viridana*, *Cnaphalocerus* spp., *Oulema oryzae*.

From the order of the Coleoptera, for example, *Anobium punctatum*, *Rhizopertha*
 20 *dominica*, *Bruchidius obtectus*, *Acanthoscelides obtectus*, *Hylotrupes bajulus*, *Agelastica alni*, *Leptinotarsa decemlineata*, *Phaedon cochleariae*, *Diabrotica* spp., *Psylliodes chrysocephala*, *Epilachna varivestis*, *Atomaria* spp., *Oryzaephilus surinamensis*, *Anthonomus* spp., *Sitophilus* spp., *Otiomhynchus sulcatus*,
 25 *Cosmopolites sordidus*, *Ceuthorrhynchus assimilis*, *Hypera postica*, *Dermestes* spp., *Trogoderma* spp., *Anthrenus* spp., *Attagenus* spp., *Lyctus* spp., *Meligethes aeneus*, *Ptinus* spp., *Niptus hololeucus*, *Gibbium psyllodes*, *Tribolium* spp., *Tenebrio molitor*, *Agriotes* spp., *Conoderus* spp., *Melolontha melolontha*, *Amphimallon solstitialis*, *Costelytra zealandica*, *Lissorhoptus oryzophilus*.

From the order of the Hymenoptera, for example, *Diprion* spp., *Hoplocampa* spp.,
 30 *Lasius* spp., *Monomorium pharaonis*, *Vespa* spp..

From the order of the Diptera, for example, *Aedes* spp., *Anopheles* spp., *Culex* spp.,
 35 *Drosophila melanogaster*, *Musca* spp., *Fannia* spp., *Calliphora erythrocephala*, *Lucilia* spp., *Chrysomyia* spp., *Cuterebra* spp., *Gastrophilus* spp., *Hyppobosca* spp., *Stomoxys* spp., *Oestrus* spp., *Hypoderma* spp., *Tabanus* spp., *Tannia* spp., *Bibio*

hortulanus, Oscinella frit, Phorbia spp., Pegomyia hyoscyami, Ceratitis capitata, Dacus oleae, Tipula paludosa, Hylemyia spp., Liriomyza spp..

5 From the order of the Siphonaptera, for example, Xenopsylla cheopis, Ceratophyllus spp..

10 From the class of the arachnids, for example, Scorpio maunus, Latrodectus mactans, Acarus siro, Argas spp., Ornithodoros spp., Dermanyssus gallinae, Eriophyes ribis, Phyllocoptura oleivora, Boophilus spp., Rhipicephalus spp., Amblyomma spp., Hyalomma spp., Ixodes spp., Psoroptes spp., Chorioptes spp., Sarcoptes spp., Tarsonemus spp., Bryobia praeliosa, Panonychus spp., Tetranychus spp., Hemitarsonemus spp., Brevipalpus spp.

15 The plant-parasitic nematodes include, for example, Pratylenchus spp., Radopholus similis, Ditylenchus dipsaci, Tylenchulus semipenetrans, Heterodera spp., Globodera spp., Meloidogyne spp., Aphelenchoides spp., Longidorus spp., Xiphinema spp., Trichodorus spp., Bursaphelenchus spp.

20 When used as insecticides, the combinations of active compounds can furthermore be present, in their commercial formulations and in the use forms prepared from these formulations, as a mixture with synergists. Synergists are compounds which enhance the activity of the active compounds, without it being necessary for the added synergist to be active for its part.

25 The content of active compounds of the use forms prepared from the commercial formulations may vary within wide ranges. The concentration of active compounds of the use forms may be from 0.0000001 to 95% by weight of active compound and is preferably from 0.0001 to 1% by weight.

30 Application is carried out in a customary manner adapted to the use forms.

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 desired and undesired wild plants or crop plants (including naturally occurring crop plants).
35 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 the plant cultivars which can or cannot be protected by plant breeder's certificates. Parts

of plants are to be understood as meaning all above-ground and below-ground parts and organs of 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. Parts of plants also include harvested plants and
5 vegetative and generative propagation material, for example seedlings, tubers, rhizomes, cuttings and seeds.

The treatment of the plants and parts of plants according to the invention with the active compounds is carried out directly or by action on their environment, habitat or
10 storage area according to customary treatment methods, for example by dipping, spraying, evaporating, atomizing, broadcasting, brushing-on and, in the case of propagation material, in particular in the case of seeds, furthermore by one- or multi-layer coating.

15 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 varieties, 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 varieties obtained by genetic engineering methods, if
20 appropriate in combination with conventional methods (Genetically Modified Organisms), and parts thereof are treated. The term "parts" or "parts of plants" or "plant parts" has been explained above.

Particularly preferably, plants of the plant varieties which are in each case
25 commercially available or in use are treated according to the invention.

Depending on the plant species or plant varieties, their location and growth conditions (soils, climate, vegetation period, diet), the treatment according to the invention may also result in superadditive ("synergistic") effects. Thus, for example,
30 reduced application rates and/or a widening of the activity spectrum and/or an increase in the activity of the substances 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
35 yields, better quality and/or a higher nutritional value of the harvested products, better storage stability and/or processability of the harvested products are possible which exceed the effects which were actually to be expected.

The transgenic plants or plant varieties (i.e. those obtained by genetic engineering) which are preferred and to be treated according to the invention include all plants which, in the genetic modification, received genetic material which imparts particularly advantageous useful traits to these plants. Examples of such traits are

5 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, better quality and/or a higher nutritional value of the harvested products, better storage stability and/or processability of the harvested products. Further and particularly emphasized

10 examples of such properties are a better defence of the plants against animal and microbial pests, such as against insects, mites, phytopathogenic fungi, bacteria and/or viruses, and also increased tolerance of the plants to certain herbicidally active compounds. Examples of transgenic plants which may be mentioned are the important crop plants, such as cereals (wheat, rice), maize, soya beans, potatoes,

15 cotton, oilseed rape and also fruit plants (with the fruits apples, pears, citrus fruits and grapes), and particular emphasis is given to maize, soya beans, potatoes, cotton and oilseed rape. Traits that are particularly emphasized are the increased defence of the plants against insects by toxins formed in the plants, in particular those formed by the genetic material from *Bacillus thuringiensis* (for example by the genes CryIA(a),

20 CryIA(b), CryIA(c), CryIIA, CryIIIA, CryIIIB2, Cry9c, Cry2Ab, Cry3Bb and CryIF and also combinations thereof) (hereinbelow referred to as "Bt plants"). Traits that are furthermore particularly emphasized are the increased tolerance of the plants to certain herbicidally active compounds, for example imidazolinones, sulphonylureas, glyphosate or phosphinotricin (for example the "PAT" gene). The genes which impart

25 the desired traits in question can also be present in combinations with one another in the transgenic plants. Examples of "Bt plants" which may be mentioned are maize varieties, cotton varieties, soya bean varieties and potato varieties which are sold under the trade names YIELD GARD® (for example maize, cotton, soya bean), KnockOut® (for example maize), StarLink® (for example maize), Bollgard®

30 (cotton), Nucotn® (cotton) 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

35 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). Of course, these statements also apply to plant varieties having these or still-

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to-be-developed genetic traits, which plant varieties will be developed and/or marketed in the future.

- 5 The plants listed can be treated according to the invention in a particularly advantageous manner with the active compound mixtures. The preferred ranges stated above for the mixtures also apply to the treatment of these plants. Particular emphasis is given to the treatment of plants with the mixtures specifically mentioned in the present text.

Use examples

Method: Safener test after spraying

Solvent: 7 parts by weight of DMF

Emulsifier: 2 parts by weight of alkylaryl polyglycol ether

- 5 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 tap water to the desired concentration. The desired amount of safener (in the case of mefenpyr-diethyl as WP 20) is mixed into the water used for dilution. Furthermore, 2 g of a.i./l of rapeseed oil methyl ester 500 EW are added.
- 10 Leaves of winter barley at the 2-leaf stage which are infested by the bird cherry-oat aphid (*Rhopalosiphum padi*) are treated with the desired active compound and safener concentrations using a spray boom, the water application rate being 300 l/ha. Per variant, the test is carried out at least twice. Evaluation is carried out after 7 d and/or 14 d by assessing the plant damage in % and the kill of the grain aphids in % compared to the untreated control. 100% damage means that the plant has died, and 0% means no damage. 100% effect on the grain aphids means that all aphids have been killed; 0% means that none of the aphids have been killed.
- 15

Results for greenhouse trials with safener after spraying against Rhopalosiphum padi on summer barley/winter barley

Table

	Application rate g of a.i./ha	Kill (%) 7d	Damage (%) 7d 14d	
Example I-1'-1	40	70	80	90
Example I-1'-1 + mefenpyr-diethyl	40 + 100	97	50	40
mefenpyr-diethyl	100	0	0	0

5 Table

	Application rate g of a.i./ha	Kill (%) 7d	Damage to new growth (%) 7d 14d	
Example I-1'-1	40	70	100	100
Example I-1'-1 + mefenpyr-diethyl	40 + 100	97	30	0
mefenpyr-diethyl	100	0	0	0

Formula to calculate the kill rate of a combination of two active compounds

The expected activity of 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 15, pages 20-22, 1967):

5 if

X is the kill rate expressed in % of the untreated control when employing active compound A at an application rate of m ppm,

Y is the kill rate expressed in % of the untreated control when employing active compound B at an application rate of n ppm,

10 E is the kill rate expressed in % of the untreated control when using the active compounds A and B at application rates of m and n ppm,

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

15 If the actual insecticidal kill rate exceeds the calculated value, the kill of the combination is superadditive, i.e. a synergistic effect is present. In this case, the actually observed kill rate must exceed the value calculated using the above formula for the expected kill rate (E).

Examples of spray application

Solvent: water

Adjuvant: rapeseed oil methyl ester (0.1% of a.i./l)

- 5 To prepare a suitable application solution, 1 part by weight of formulation is mixed with the appropriate amount of water and the adjuvant and the concentrate is diluted with water to the desired concentration.

Example A**Aphis gossypii test**

- 10 Cotton plants (*Gossypium herbaceum*) which are heavily infested by the cotton aphid (*Aphis gossypii*) are sprayed to runoff point with the desired concentration of the application solution.

Example B**Metopolophium dirhodum test**

- 15 Barley plants (*Hordeum vulgare*) which are heavily infested by a grain aphid (*Metopolophium dirhodum*) are sprayed to runoff point with the desired concentration of the application solution.

Example C**Myzus persicae test**

- 20 Bell pepper plants (*Capsicum sativum*) which are heavily infested by the green peach aphid (*Myzus persicae*) are sprayed to runoff point with the desired concentration of the application solution.

After the desired period of time, the kill in % is determined. 100% means that all aphids have been killed; 0% means that none of the aphids have been killed. The determined kill rates are entered in Colby's formula.

- 25 In this test, for example, the following active compound combination in accordance with the present application shows a synergistically enhanced activity compared to

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the active compounds applied individually:

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Table A
Plant-damaging insects
Aphis gossypii – Test

Formulation	Concentration in ppm	Kill rate in % after 7 ^d	
Ex. (I-1'-5)	20	30	
SC 240			
Isoxadifen-ethyl WG 50	50	0	
Ex. (I-1'-5) + Isoxadifen-ethyl (1:2.5)		found*	calc. **
according to the invention	20 + 50	50	30
Mefenpyr-diethyl WG 15	100	0	
Ex. (I-1'-5) + Mefenpyr-diethyl (1:5)		found*	calc. **
according to the invention	20 + 100	55	30
Ex. (IIe-5) a.i.	100	0	
Ex. (I-1'-5) + (Ex. IIe-5)		found*	calc. **
according to the invention	20 + 100	50	30
Cloquintocet-mexyl WP 20	100	5	
Ex. (I-1'-5) + Cloquintocet-mexyl (1:5)		found*	calc. **
according to the invention	20 + 100	70	33.5
Dichlormid a.i.	100	0	
Ex. (I-1'-5) + Dichlormid (1:5)		found*	calc. **
according to the invention	20 + 100	55	30

5 * found = activity found
 ** calc. = activity calculated using Colby's formula

Table B
Plant-damaging insects
Metopolophium dirhodum-Test

Formulation	Concentration in ppm	Kill rate in % after 7 ^d	
Ex. (I-1'-5)	20	15	
SC 240			
Isxadifen-ethyl WG 50	25	0	
Ex. (I-1'-5) + Isxadifen-ethyl (1:1.25)		found*	calc. **
according to the invention	20 + 25	35	15
Ex. (IIe-5)	100	0	
Ex. (I-1'-5) + (Ex. IIe-5) (1:5)		found*	calc. **
according to the invention	20 + 100	35	15
Dichloramid a.i.	100	0	
Ex. (I-1'-5) + Dichloramid(1:5)		found*	calc. **
according to the invention	20 + 100	40	15
Fenclorim a.i.	25	0	
Ex. (I-1'-5) + Fenclorim (1:1.25)		found*	calc. **
according to the invention	20 + 25	35	15

5 * found = activity found
** calc. = activity calculated using Colby's formula

Table C
Plant-damaging insects
Myzus persicae – Test

Formulation	Concentration in ppm	Kill rate in % after 7 ^d	
Ex. (I-1'-5) SC 240	20	0	
Mefenpyr-diethyl WG 15	100	5	
Ex. (I-1'-5) + Mefenpyr-diethyl (1:5) according to the invention	20 + 100	found*	calc. **
		35	5
Ex. (IIe-5)	100	5	
Ex. (I-1'-5) + (Ex. IIe-5) (1:5) according to the invention	20 + 100	found*	calc. **
		70	5
Cloquintocet-mexyl WP 20	25	0	
Ex. (I-1'-5) + Cloquintocet-mexyl (1:1.25) according to the invention	20 + 25	found*	calc. **
		80	0
Dichlormid a.i.	100	0	
Ex. (I-1'-5) + Dichlormid (1:5) according to the invention	20 + 100	found*	calc. **
		94	0
Fenclorim a.i.	50	0	
Ex. (I-1'-5) + Fenclorim (1:2.5) according to the invention	20 + 50	found*	calc. **
		90	0
Furilazole a.i.	50	0	
Ex. (I-1'-5) + Furilazole (1:2.5) according to the invention	20 + 50	found*	calc. **
		87.5	0

5 * found = activity found
** calc. = activity calculated using Colby's formula

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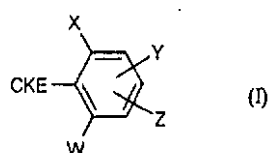
Throughout this specification and the claims which follow, unless the context requires otherwise, the word "comprise", and variations such as "comprises" or "comprising", will be understood to imply the inclusion of a stated integer or step or group of integers or steps but not the exclusion of any other integer or step or group of integers or steps.

- s The reference in this specification to any prior publication (or information derived from it), or to any matter which is known, is not, and should not be taken as an acknowledgment or admission or any form of suggestion that that prior publication (or information derived from it) or known matter forms part of the common general knowledge in the field of endeavour to which this specification relates.

Patent Claims

1. Use of a composition comprising an effective amount of an active compound combination comprising

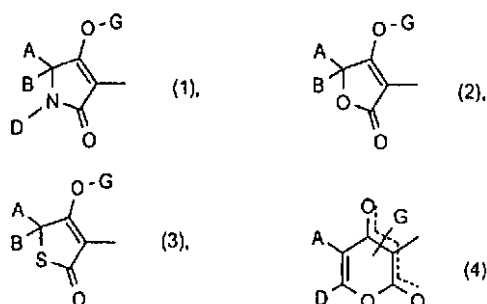
- (a) at least one substituted cyclic ketoenol of the formula (I)



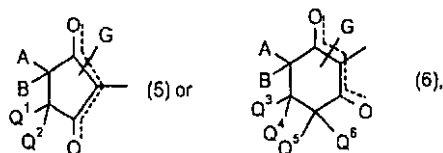
5

in which

- X represents halogen, alkyl, alkenyl, alkynyl, alkoxy, alkenyloxy, alkylthio, alkylsulphinyl, alkylsulphonyl, haloalkyl, haloalkoxy, haloalkenyloxy, nitro or cyano,
- 10 Z represents hydrogen, alkyl, halogen, alkenyl, alkynyl, represents in each case optionally substituted aryl or hetaryl,
- W and Y independently of one another represent hydrogen, halogen, alkyl, alkoxy, alkenyloxy, haloalkyl, haloalkoxy, haloalkenyloxy, nitro or cyano,
- 15 CKE represents one of the groups



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in which

- 5 A represents hydrogen, in each case optionally halogen-substituted alkyl, alkenyl, alkoxyalkyl, alkylthioalkyl, saturated or unsaturated, optionally substituted cycloalkyl, in which optionally at least one ring atom is replaced by a heteroatom, or in each case optionally halogen-, alkyl-, haloalkyl-, alkoxy-,
- 10 haloalkoxy-, cyano- or nitro-substituted aryl, arylalkyl or hetaryl,
- B represents hydrogen, alkyl or alkoxyalkyl, or
- 15 A and B together with the carbon atom to which they are attached represent a saturated or unsaturated, unsubstituted or substituted cycle which optionally contains at least one heteroatom,
- 20 D represents hydrogen or an optionally substituted radical from the group consisting of alkyl, alkenyl, alkynyl, alkoxyalkyl, saturated or unsaturated cycloalkyl, in which optionally one or more ring members are replaced by heteroatoms, arylalkyl, aryl, hetarylalkyl or hetaryl, or
- 25 A and D together with the atoms to which they are attached represent a saturated or unsaturated cycle which is unsubstituted or substituted in the A,D moiety and optionally contains at least one heteroatom, or

A and Q¹ together represent alkanediyl or alkenediyl which are in each case optionally substituted by hydroxyl or by in each case optionally substituted alkyl, alkoxy, alkylthio, cycloalkyl, benzyloxy or aryl, or

5

Q¹ represents hydrogen or alkyl,

Q², Q⁴, Q⁵ and Q⁶ independently of one another represent hydrogen or alkyl,

10

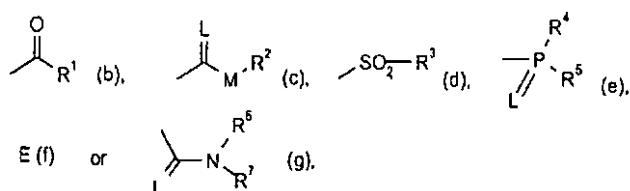
Q³ represents hydrogen, alkyl, alkoxyalkyl, alkylthioalkyl, optionally substituted cycloalkyl (in which optionally one methylene group is replaced by oxygen or sulphur) or optionally substituted phenyl, or

15

Q³ and Q⁴ together with the carbon atom to which they are attached, represent a saturated or unsaturated, unsubstituted or substituted cycle which optionally contains a heteroatom,

20

G represents hydrogen (a) or represents one of the groups



in which

25

E represents a metal ion equivalent or an ammonium ion,

L represents oxygen or sulphur,

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M represents oxygen or sulphur,

R¹ represents in each case optionally halogen-substituted alkyl, alkenyl, alkoxyalkyl, alkylthioalkyl, polyalkoxyalkyl or optionally halogen-, alkyl- or alkoxy-substituted cycloalkyl, which may be interrupted by at least one heteroatom, represents in each case optionally substituted phenyl, phenylalkyl, hetaryl, phenoxyalkyl or hetarylalkoxyalkyl,

R² represents in each case optionally halogen-substituted alkyl, alkenyl, alkoxyalkyl, polyalkoxyalkyl or represents in each case optionally substituted cycloalkyl, phenyl or benzyl,

R³, R⁴ and R⁵ independently of one another represent in each case optionally halogen-substituted alkyl, alkoxy, alkylamino, dialkylamino, alkylthio, alkenylthio, cycloalkylthio and represent in each case optionally substituted phenyl, benzyl, phenoxy or phenylthio,

R⁶ and R⁷ independently of one another represent hydrogen, in each case optionally halogen-substituted alkyl, cycloalkyl, alkenyl, alkoxy, alkoxyalkyl, represent optionally substituted phenyl, represent optionally substituted benzyl, or together with the N atom to which they are attached represent a cycle which is optionally interrupted by oxygen or sulphur,

- including all possible tautomeric forms of the compounds of the general formula (I) and the possible salts or acid or base adducts of the compounds of the general formula (I) -

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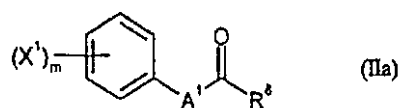
and

(b) at least one crop plant compatibility-improving compound, from the group of compounds below:

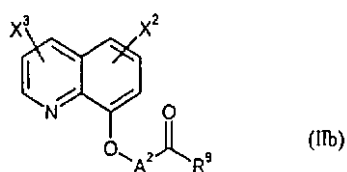
- 4-dichloroacetyl-1-oxa-4-aza-spiro [4.5]-decane (AD-67, MON-4660), 1-dichloroacetyl-
- 5 hexahydro-3,3,8a-trimethylpyrrolo[1,2-a]-pyrimidin-6(2H)-one (dicyclonon, BAS-145138), 4-dichloroacetyl-3,4-dihydro-3-methyl-2H-1,4-benzoxazine (benoxacor), 1-methyl-hexyl 5-chloro-quinolin-8-oxy-acetate (cloquintocet-mexyl), 3-(2-chloro-benzyl)-1-(1-methyl-1-phenyl-ethyl)-urea (cumyluron), α -(cyanomethoximino)-phenylacetoneitrile (cyometrinil), 2,4-dichloro-phenoxyacetic acid (2,4-D), 4-(2,4-dichloro-phenoxy)-butyric
- 10 acid (2,4-DB), 1-(1-methyl-1-phenyl-ethyl)-3-(4-methyl-phenyl)-urea (daimuron, dymron), 3,6-dichloro-2-methoxy-benzoic acid (dicamba), S-1-methyl-1-phenyl-ethyl piperidine-1-thiocarboxylate (dimepiperate), 2,2-dichloro-N-(2-oxo-2-(2-propenylamino)-ethyl)-N-(2-propenyl)-acetamide (DKA-24), 2,2-dichloro-N,N-di-2-propenyl-acetamide (dichlormid), 4,6-dichloro-2-phenyl-pyrimidine (fencloirim), ethyl 1-(2,4-dichloro-phenyl)-5-
- 15 trichloromethyl-1H-1,2,4-triazole-3-carboxylate (fenchlorazole-ethyl), phenyl-methyl 2-chloro-4-trifluoromethyl-thiazole-5-carboxylate (flurazole), 4-chloro-N-(1,3-dioxolan-2-yl-methoxy)- α -trifluoro-acetophenone oxime (fluxofenim), 3-dichloroacetyl-5-(2-furanyl)-2,2-dimethyl-oxazolidine (furalazole, MON-13900), ethyl 4,5-dihydro-5,5-diphenyl-3-isoxazolecarboxylate (isoxadifen-ethyl), 1-(ethoxycarbonyl)-ethyl 3,6-dichloro-2-
- 20 methoxybenzoate (lactidichlor), (4-chloro-o-tolyloxy)-acetic acid (MCPA), 2-(4-chloro-o-tolyloxy)-propionic acid (mecoprop), diethyl 1-(2,4-dichloro-phenyl)-4,5-dihydro-5-methyl-1H-pyrazole-3,5-dicarboxylate (mefenpyr-diethyl), 2-dichloromethyl-2-methyl-1,3-dioxolane (MG-191), 2-propenyl-1-oxa-4-azaspiro[4.5]decane 4-carbodithioate (MG-838), 1,8-naphthalic anhydride, α -(1,3-dioxolan-2-yl-methoximino)-phenylacetoneitrile
- 25 (oxabetrinil), 2,2-dichloro-N-(1,3-dioxolan-2-yl-methyl)-N-(2-propenyl)-acetamide (PPG-1292), 3-dichloroacetyl-2,2-dimethyl-oxazolidine (R-28725), 3-dichloroacetyl-2,2,5-trimethyl-oxazolidine (R-29148), 4-(4-chloro-o-tolyl)-butyric acid, 4-(4-chloro-phenoxy)-butyric acid, diphenylmethoxyacetic acid, methyl diphenylmethoxyacetate, ethyl diphenylmethoxyacetate, methyl 1-(2-chloro-phenyl)-5-phenyl-1H-pyrazole-3-
- 30 carboxylate, ethyl 1-(2,4-dichloro-phenyl)-5-methyl-1H-pyrazole-3-carboxylate, ethyl 1-(2,4-dichloro-phenyl)-5-isopropyl-1H-pyrazole-3-carboxylate, ethyl 1-(2,4-dichloro-phenyl)-5-(1,1-dimethyl-ethyl)-1H-pyrazole-3-carboxylate, ethyl 1-(2,4-dichloro-phenyl)-

and/or one of the following compounds of the

general formula (IIa)

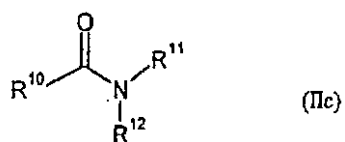


5 or of the general formula (IIb)



or the formula (IIc)

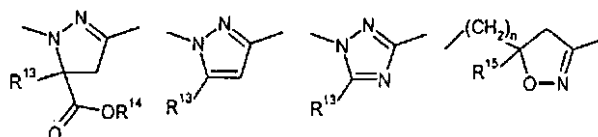
10



where

15 m represents a number 0, 1, 2, 3, 4 or 5,

A¹ represents one of the divalent heterocyclic groupings shown below

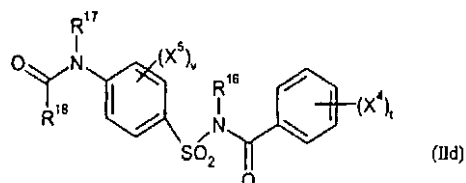


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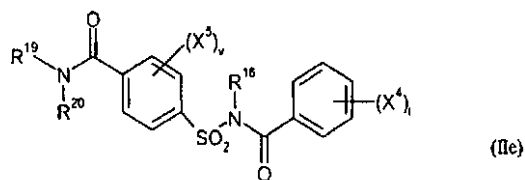
- n represents a number 0, 1, 2, 3, 4 or 5,
- 5 A^2 represents optionally C_1-C_4 -alkyl- and/or C_1-C_4 -alkoxy-carbonyl- and/or C_1-C_4 -alkenyloxy-carbonyl-substituted alkanediyl with 1 or 2 carbon atoms,
- R^8 represents hydroxyl, mercapto, amino, C_1-C_6 -alkoxy, C_1-C_6 -alkylthio, C_1-C_6 -alkylamino or di- $(C_1-C_4$ -alkyl)-amino,
- 10 R^9 represents hydroxyl, mercapto, amino, C_1-C_7 -alkoxy, C_1-C_6 -alkenyloxy, C_1-C_6 -alkenyloxy- C_1-C_6 -alkoxy, C_1-C_6 -alkylthio, C_1-C_6 -alkylamino or di- $(C_1-C_4$ -alkyl)-amino,
- 15 R^{10} represents in each case optionally fluorine-, chlorine- and/or bromine-substituted C_1-C_4 -alkyl,
- R^{11} represents hydrogen, in each case optionally fluorine-, chlorine- and/or bromine-substituted C_1-C_6 -alkyl, C_2-C_6 -alkenyl or C_2-C_6 -alkynyl, C_1-C_4 -alkoxy- C_1-C_4 -alkyl, dioxolanyl- C_1-C_4 -alkyl, furyl, furyl- C_1-C_4 -alkyl, thienyl, thiazolyl, piperidinyl, or optionally fluorine-, chlorine- and/or bromine- or C_1-C_4 -alkyl-substituted phenyl,
- 20 R^{12} represents hydrogen, in each case optionally fluorine-, chlorine- and/or bromine-substituted C_1-C_6 -alkyl, C_2-C_6 -alkenyl or C_2-C_6 -alkynyl, C_1-C_4 -alkoxy- C_1-C_4 -alkyl, dioxolanyl- C_1-C_4 -alkyl, furyl, furyl- C_1-C_4 -alkyl, thienyl, thiazolyl, piperidinyl, or optionally fluorine-, chlorine- and/or bromine- or C_1-C_4 -alkyl-substituted phenyl, or R^{11} and R^{12} together also represent C_3-C_6 -alkanediyl or C_2-C_5 -oxaalkanediyl, each of which is optionally substituted by C_1-C_4 -alkyl, phenyl, furyl, a fused-on benzene ring or by two substituents which together with the
- 25 C atom to which they are attached form a 5- or 6-membered carbocycle,
- 30

- R^{13} represents hydrogen, cyano, halogen, or represents in each case optionally fluorine-, chlorine- and/or bromine-substituted C_1-C_4 -alkyl, C_3-C_6 -cycloalkyl or phenyl,
- 5 R^{14} represents hydrogen, optionally hydroxyl-, cyano-, halogen- or C_1-C_4 -alkoxy-substituted C_1-C_6 -alkyl, C_3-C_6 -cycloalkyl or tri- $(C_1-C_4$ -alkyl)-silyl,
- 10 R^{15} represents hydrogen, cyano, halogen, or represents in each case optionally fluorine-, chlorine- and/or bromine-substituted C_1-C_4 -alkyl, C_3-C_6 -cycloalkyl or phenyl,
- 15 X^1 represents nitro, cyano, halogen, C_1-C_4 -alkyl, C_1-C_4 -haloalkyl, C_1-C_4 -alkoxy or C_1-C_4 -haloalkoxy,
- 20 X^2 represents hydrogen, cyano, nitro, halogen, C_1-C_4 -alkyl, C_1-C_4 -haloalkyl, C_1-C_4 -alkoxy or C_1-C_4 -haloalkoxy,
- X^3 represents hydrogen, cyano, nitro, halogen, C_1-C_4 -alkyl, C_1-C_4 -haloalkyl, C_1-C_4 -alkoxy or C_1-C_4 -haloalkoxy,

and/or the following compounds defined by general formulae of the general formula (IIc)



or of the general formula (Ile)



where

- 5 t represents a number 0, 1, 2, 3, 4 and 5,
- v represents a number 0, 1, 2, 3, 4 and 5,
- 10 R¹⁶ represents hydrogen or C₁-C₄-alkyl,
- R¹⁷ represents hydrogen or C₁-C₄-alkyl,
- 15 R¹⁸ represents hydrogen, in each case optionally cyano-, halogen- or C₁-C₄-alkoxy-substituted C₁-C₆-alkyl, C₁-C₆-alkoxy, C₁-C₆-alkylthio, C₁-C₆-alkylamino or di-(C₁-C₄-alkyl)-amino, or in each case optionally cyano-, halogen- or C₁-C₄-alkyl-substituted C₃-C₆-cycloalkyl, C₃-C₆-cycloalkyloxy, C₃-C₆-cycloalkylthio or C₃-C₆-cycloalkylamino,
- 20 R¹⁹ represents hydrogen, optionally cyano-, hydroxyl-, halogen- or C₁-C₄-alkoxy-substituted C₁-C₆-alkyl, in each case optionally cyano- or halogen-substituted C₃-C₆-alkenyl or C₃-C₆-alkynyl, or optionally cyano-, halogen- or C₁-C₄-alkyl-substituted C₃-C₆-cycloalkyl,
- 25 R²⁰ represents hydrogen, optionally cyano-, hydroxyl-, halogen- or C₁-C₄-alkoxy-substituted C₁-C₆-alkyl, in each case optionally cyano- or halogen-substituted C₃-C₆-alkenyl or C₃-C₆-alkynyl, optionally cyano-, halogen- or C₁-C₄-alkyl-substituted C₃-C₆-cycloalkyl, or optionally nitro-, cyano-, halogen-, C₁-C₄-alkyl-, C₁-C₄-haloalkyl-, C₁-C₄-alkoxy- or C₁-C₄-haloalkoxy-substituted phenyl, or together with R¹⁹

represents in each case optionally C₁-C₄-alkyl-substituted C₂-C₆-alkanediyl or C₂-C₅-oxaalkanediyl,

5 X⁴ represents nitro, cyano, carboxyl, carbamoyl, formyl, sulphamoyl, hydroxyl, amino, halogen, C₁-C₄-alkyl, C₁-C₄-haloalkyl, C₁-C₄-alkoxy or C₁-C₄-haloalkoxy, and

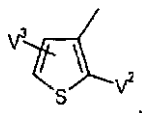
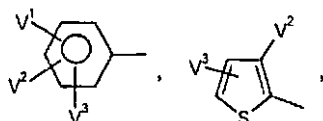
10 X⁵ represents nitro, cyano, carboxyl, carbamoyl, formyl, sulphamoyl, hydroxyl, amino, halogen, C₁-C₄-alkyl, C₁-C₄-haloalkyl, C₁-C₄-alkoxy or C₁-C₄-haloalkoxy,

for controlling insects and/or arachnids.

2. Use of a composition according to Claim 1 for controlling insects and/or arachnids, which compositions comprise compounds of the formula (I) in which

15 X represents halogen, C₁-C₆-alkyl, C₂-C₆-alkenyl, C₂-C₆-alkynyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy, C₃-C₆-alkenyloxy, C₁-C₆-haloalkoxy, C₃-C₆-haloalkenyloxy, nitro or cyano,

20 Z represents hydrogen, halogen, C₁-C₆-alkyl, C₂-C₆-alkenyl, C₂-C₆-alkynyl or represents one of the radicals



in which

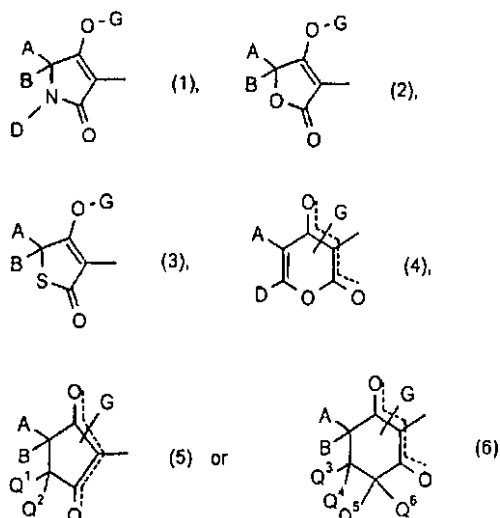
V¹ represents hydrogen, halogen, C₁-C₁₂-alkyl, C₁-C₆-alkoxy, C₁-C₆-

alkylthio, C₁-C₆-alkylsulphinyl, C₁-C₆-alkylsulphonyl, C₁-C₄-haloalkyl, C₁-C₄-haloalkoxy, nitro or cyano,

V² and V³ independently of one another represent hydrogen, halogen, C₁-C₆-alkyl, C₁-C₆-alkoxy, C₁-C₄-haloalkyl or C₁-C₄-haloalkoxy,

5 W and Y independently of one another represent hydrogen, halogen, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy, C₁-C₆-haloalkoxy, nitro or cyano,

CKE represents one of the groups



15 A represents hydrogen or in each case optionally halogen-substituted C₁-C₁₂-alkyl, C₂-C₄-alkenyl, C₁-C₁₀-alkoxy-C₁-C₆-alkyl, C₁-C₁₀-alkylthio-C₁-C₆-alkyl, optionally halogen-, C₁-C₆-alkyl- or C₁-C₆-alkoxy-substituted C₃-C₈-cycloalkyl in which optionally one or two not directly adjacent ring members are replaced by oxygen and/or sulphur or represents in each case optionally halogen-, C₁-C₆-alkyl-, C₁-C₆-haloalkyl-, C₁-C₆-alkoxy-, C₁-C₆-haloalkoxy-, cyano- or nitro-substituted phenyl or phenyl-C₁-C₆-alkyl,

- B represents hydrogen, C₁-C₁₂-alkyl or C₁-C₈-alkoxy-C₁-C₆-alkyl, or
- 5 A, B and the carbon atom to which they are attached represent saturated C₃-C₁₀-cycloalkyl or unsaturated C₃-C₁₀-cycloalkyl in which optionally one ring member is replaced by oxygen or sulphur and which are optionally mono- or disubstituted by C₁-C₈-alkyl, C₃-C₁₀-cycloalkyl, C₁-C₈-haloalkyl, C₁-C₈-alkoxy, C₁-C₈-alkylthio, halogen or phenyl, or
- 10 A, B and the carbon atom to which they are attached represent C₃-C₆-cycloalkyl which is substituted by an alkylenediyl or by an alkylenedioxyl or by an alkylenedithiol group which, with the carbon atom to which it is attached, forms a further 5- to 8-membered ring and which is optionally substituted by C₁-C₄-alkyl which optionally contains one or two not directly adjacent oxygen and/or sulphur atoms, or
- 15 A, B and the carbon atom to which they are attached represent C₃-C₈-cycloalkyl or C₃-C₈-cycloalkenyl in which two substituents together with the carbon atoms to which they are attached represent in each case optionally C₁-C₆-alkyl-, C₁-C₆-alkoxy- or halogen-substituted C₂-C₆-alkanediyl, C₂-C₆-alkenediyl or C₄-C₆-alkanedicnediyl in which optionally one methylene group is replaced by oxygen or sulphur,
- 20 D represents hydrogen, in each case optionally halogen-substituted C₁-C₁₂-alkyl, C₃-C₈-alkenyl, C₃-C₈-alkynyl, C₁-C₁₀-alkoxy-C₂-C₈-alkyl, optionally halogen-, C₁-C₄-alkyl-, C₁-C₄-alkoxy- or C₁-C₄-haloalkyl-substituted C₃-C₈-cycloalkyl in which optionally one ring member is replaced by oxygen or sulphur or represents in each case optionally halogen-, C₁-C₆-alkyl-, C₁-C₆-haloalkyl-, C₁-C₆-alkoxy-, C₁-C₆-haloalkoxy-, cyano- or nitro-substituted phenyl or phenyl-C₁-C₆-alkyl,
- 25 A and D together represent in each case optionally substituted C₃-C₆-alkanediyl or C₃-C₆-alkenediyl in which optionally one methylene group is replaced by a carbonyl group, by oxygen or by
- 30

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sulphur,

possible substituents being in each case:

halogen, hydroxyl, mercapto or in each case optionally halogen-substituted C₁-C₁₀-alkyl or C₁-C₆-alkoxy, or a further C₃-C₆-alkanediyl grouping, C₃-C₆-alkenediyl grouping or a butadienyl grouping which is optionally substituted by C₁-C₆-alkyl or in which optionally two adjacent substituents together with the carbon atoms to which they are attached form a further saturated or unsaturated cycle having 5 or 6 ring atoms (in the case of the compounds of the formula (I-1), A and D together with the atoms to which they are attached then represent, for example, the groups AD-1 to AD-10 mentioned further below), which may contain oxygen or sulphur,

A and Q¹ together represent C₃-C₆-alkanediyl or C₄-C₆-alkenediyl, each of which is optionally mono- or disubstituted by identical or different halogens, by C₁-C₁₀-alkyl, C₁-C₆-alkoxy, C₁-C₆-alkylthio, C₃-C₇-cycloalkyl, each of which is optionally mono- to trisubstituted by identical or different halogens, or by benzyloxy or phenyl, each of which is optionally mono- to trisubstituted by identical or different substituents from the group consisting of halogen, C₁-C₆-alkyl and C₁-C₆-alkoxy, where the C₃-C₆-alkanediyl or C₄-C₆-alkenediyl is furthermore bridged by a C₁-C₂-alkanediyl group or by an oxygen atom, or

Q¹ represents hydrogen or C₁-C₄-alkyl,

Q², Q⁴, Q⁵ and Q⁶ independently of one another represent hydrogen or C₁-C₄-alkyl,

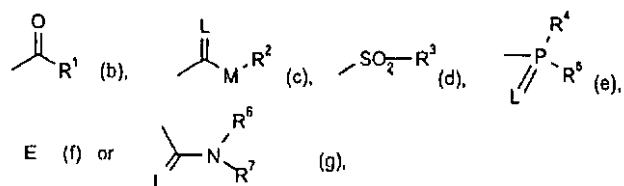
Q³ represents hydrogen, C₁-C₆-alkyl, C₁-C₆-alkoxy-C₁-C₂-alkyl, C₁-C₆-alkylthio-C₁-C₂-alkyl, optionally halogen-, C₁-C₄-alkyl- or C₁-C₄-alkoxy-substituted C₃-C₈-cycloalkyl in which optionally one methylene group is replaced by oxygen or sulphur or represents

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optionally halogen-, C₁-C₄-alkyl-, C₁-C₄-alkoxy-, C₁-C₂-haloalkyl-,
C₁-C₂-haloalkoxy-, cyano- or nitro-substituted phenyl, or

Q³ and Q⁴ together with the carbon atom to which they are attached represent
an optionally C₁-C₄-alkyl-, C₁-C₄-alkoxy- or C₁-C₂-haloalkyl-
substituted C₃-C₇-ring in which optionally one ring atom is replaced
by oxygen or sulphur,

G represents hydrogen (a) or represents one of the groups



in which

E represents a metal ion equivalent or an ammonium ion,

L represents oxygen or sulphur and

M represents oxygen or sulphur,

R¹ represents in each case optionally halogen-substituted C₁-C₂₀-alkyl,
C₂-C₂₀-alkenyl, C₁-C₈-alkoxy-C₁-C₈-alkyl, C₁-C₈-alkylthio-C₁-C₈-
alkyl, poly-C₁-C₈-alkoxy-C₁-C₈-alkyl or optionally halogen-,
C₁-C₆-alkyl- or C₁-C₆-alkoxy-substituted C₃-C₈-cycloalkyl in which
optionally one or more not directly adjacent ring members are replaced
by oxygen and/or sulphur,

represents optionally halogen-, cyano-, nitro-, C₁-C₆-alkyl-,
C₁-C₆-alkoxy-, C₁-C₆-haloalkyl-, C₁-C₆-haloalkoxy-, C₁-C₆-alkylthio-
or C₁-C₆-alkylsulphonyl-substituted phenyl,

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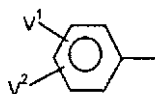
- represents optionally halogen-, nitro-, cyano-, C₁-C₆-alkyl-, C₁-C₆-alkoxy-, C₁-C₆-haloalkyl- or C₁-C₆-haloalkoxy-substituted phenyl-C₁-C₆-alkyl,
- 5 represents optionally halogen- or C₁-C₆-alkyl-substituted 5- or 6-membered hetaryl,
- represents optionally halogen- or C₁-C₆-alkyl-substituted phenoxy-C₁-C₆-alkyl or
- represents optionally halogen-, amino- or C₁-C₆-alkyl-substituted 5- or 6-membered hetaryloxy-C₁-C₆-alkyl,
- 10 R² represents in each case optionally halogen-substituted C₁-C₂₀-alkyl, C₂-C₂₀-alkenyl, C₁-C₈-alkoxy-C₂-C₈-alkyl, poly-C₁-C₈-alkoxy-C₂-C₈-alkyl,
- represents optionally halogen-, C₁-C₆-alkyl- or C₁-C₆-alkoxy-substituted C₃-C₈-cycloalkyl or
- 15 represents in each case optionally halogen-, cyano-, nitro-, C₁-C₆-alkyl, C₁-C₆-alkoxy-, C₁-C₆-haloalkyl- or C₁-C₆-haloalkoxy substituted phenyl or benzyl,
- R³ represents optionally halogen-substituted C₁-C₄-alkyl or represents in each case optionally halogen-, C₁-C₆-alkyl-, C₁-C₆-alkoxy-, C₁-C₄-haloalkyl-, C₁-C₄-haloalkoxy-, cyano- or nitro-substituted
- 20 phenyl or benzyl,
- R⁴ and R⁵ independently of one another represent in each case optionally halogen-substituted C₃-C₈-alkyl, C₁-C₄-alkoxy, C₁-C₈-alkylamino, di-(C₁-C₈-alkyl)amino, C₁-C₈-alkylthio, C₂-C₈-alkenylthio, C₃-C₇-cycloalkylthio or represent in each case optionally halogen-, nitro-, cyano-, C₁-C₄-alkoxy-, C₁-C₄-haloalkoxy-, C₁-C₄-alkylthio-, C₁-C₄-haloalkylthio-, C₁-C₄-alkyl- or C₁-C₄-haloalkyl-substituted phenyl, phenoxy or phenylthio,
- 25

5 R^6 and R^7 independently of one another represent hydrogen, represent in each case optionally halogen-substituted C_1-C_8 -alkyl, C_3-C_8 -cycloalkyl, C_1-C_8 -alkoxy, C_3-C_8 -alkenyl, C_1-C_8 -alkoxy- C_1-C_8 -alkyl, represent optionally halogen-, C_1-C_8 -haloalkyl-, C_1-C_8 -alkyl- or C_1-C_8 -alkoxy-substituted phenyl, optionally halogen-, C_1-C_8 -alkyl-, C_1-C_8 -haloalkyl- or C_1-C_8 -alkoxy-substituted benzyl or together represent an optionally C_1-C_4 -alkyl-substituted C_3-C_8 -alkylene radical in which optionally one carbon atom is replaced by oxygen or sulphur.

10 3. Use of a composition according to Claim 1 for controlling insects or arachnids, which composition comprises compounds of the formula (I) in which

X represents fluorine, chlorine, bromine, C_1-C_4 -alkyl, C_2-C_4 -alkenyl, C_2-C_4 -alkynyl, C_1-C_4 -alkoxy, C_1-C_4 -haloalkyl, C_1-C_4 -haloalkoxy or cyano,

15 Z represents hydrogen, fluorine, chlorine, bromine, C_1-C_4 -alkyl, C_2-C_4 -alkenyl, C_2-C_4 -alkynyl or represents the radical

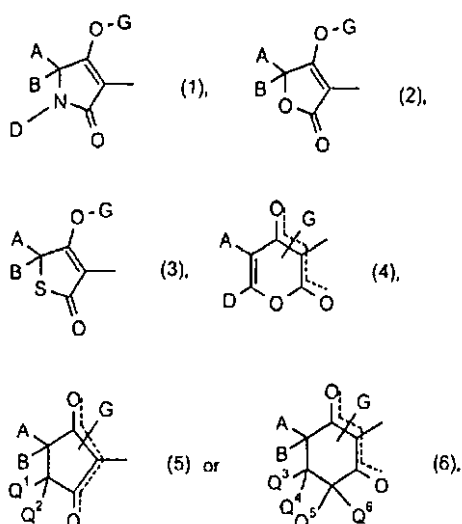


V^1 represents hydrogen, fluorine, chlorine, bromine, C_1-C_6 -alkyl, C_1-C_4 -alkoxy, C_1-C_2 -haloalkyl, C_1-C_2 -haloalkoxy, nitro or cyano,

20 V^2 represents hydrogen, fluorine, chlorine, bromine, C_1-C_4 -alkyl, C_1-C_4 -alkoxy, C_1-C_2 -haloalkyl or C_1-C_2 -haloalkoxy,

W and Y independently of one another represent hydrogen, fluorine, chlorine, bromine, C_1-C_4 -alkyl, C_1-C_4 -haloalkyl, C_1-C_4 -alkoxy or C_1-C_4 -haloalkoxy,

CKE represents one of the groups

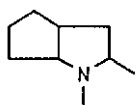


- 5 A represents hydrogen, in each case optionally fluorine- or chlorine-substituted C₁-C₆-alkyl, C₁-C₄-alkoxy-C₁-C₄-alkyl or optionally fluorine-, chlorine-, C₁-C₄-alkyl- or C₁-C₄-alkoxy-substituted C₃-C₇-cycloalkyl,
- B represents hydrogen or C₁-C₆-alkyl, or
- 10 A, B and the carbon atom to which they are attached represent saturated C₃-C₇-cycloalkyl or unsaturated C₃-C₇-cycloalkyl in which optionally one ring member is replaced by oxygen or sulphur and which is optionally monosubstituted by C₁-C₆-alkyl, C₁-C₃-haloalkyl or C₁-C₆-alkoxy, or
- 15 A, B and the carbon atom to which they are attached represent C₃-C₆-cycloalkyl which is substituted by an alkylenediyl or by an alkylenedioxy or by an alkylenedithiol group which, together with the carbon atom to which it is attached, forms a further five- or six-membered ring and which is optionally substituted by methyl or ethyl and optionally contains one or two not directly adjacent oxygen or sulphur atoms,

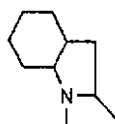
D represents hydrogen, represents in each case optionally fluorine- or chlorine-substituted C₁-C₆-alkyl, C₃-C₆-alkenyl, C₁-C₄-alkoxy-C₂-C₃-alkyl, represents optionally C₁-C₄-alkyl-, C₁-C₄-alkoxy- or C₁-C₂-haloalkyl-substituted C₃-C₇-cycloalkyl, or

5 A and D together represent optionally substituted C₃-C₃-alkanediyl in which one methylene group may be replaced by oxygen or sulphur, possible substituents being C₁-C₄-alkyl, or

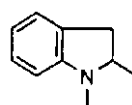
10 A and D (in the case of the compounds of the formula (I-1)) together with the atoms to which they are attached represent one of the groups AD-1 to AD-10:



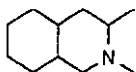
AD-1



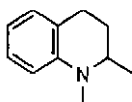
AD-2



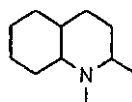
AD-3



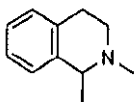
AD-4



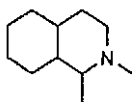
AD-5



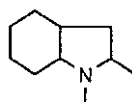
AD-6



AD-7

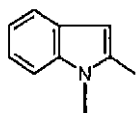


AD-8



AD-9

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AD-10

A and Q¹ together represent C₃-C₄-alkanediyl or C₃-C₄-alkenediyl, each of which is optionally mono- or disubstituted by identical or different substituents from the group consisting of C₁-C₄-alkyl and C₁-C₄-alkoxy, or

5 Q¹ represents hydrogen,

Q² represents hydrogen,

Q⁴, Q⁵ and Q⁶ independently of one another represent hydrogen or C₁-C₂-alkyl,

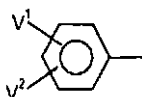
10 Q³ represents hydrogen, C₁-C₄-alkyl, C₁-C₄-alkoxy-C₁-C₂-alkyl, C₁-C₄-alkylthio-C₁-C₂-alkyl or optionally methyl- or methoxy-substituted C₃-C₆-cycloalkyl in which optionally one methylene group is replaced by oxygen or sulphur, or

15 Q³ and Q⁴ together with the carbon to which they are attached represent an optionally C₁-C₄-alkyl- or C₁-C₄-alkoxy-substituted saturated C₅-C₆-ring in which optionally one ring member is replaced by oxygen or sulphur,

G represents hydrogen (a) or represents one of the groups

- optionally fluorine-, chlorine-, bromine-, C₁-C₄-alkyl-, C₁-C₄-alkoxy-, C₁-C₃-haloalkyl-, C₁-C₃-haloalkoxy-, cyano- or nitro-substituted phenyl,
- 5 R⁴ represents C₁-C₆-alkyl, C₁-C₆-alkoxy, C₁-C₆-alkylamino, di-(C₁-C₆-alkyl)amino, C₁-C₆-alkylthio, C₃-C₄-alkenylthio, C₁-C₆-cycloalkylthio or represents in each case optionally fluorine-, chlorine-, bromine-, nitro-, cyano-, C₁-C₃-alkoxy-, C₁-C₃-haloalkoxy-, C₁-C₃-alkylthio-, C₁-C₃-haloalkylthio-, C₁-C₃-alkyl- or C₁-C₃-haloalkyl-substituted phenyl, phenoxy or phenylthio,
- 10 R⁵ represents C₁-C₆-alkoxy or C₁-C₆-alkylthio,
- R⁶ represents hydrogen, C₁-C₆-alkyl, C₃-C₆-cycloalkyl, C₁-C₆-alkoxy, C₃-C₆-alkenyl, C₁-C₆-alkoxy-C₁-C₄-alkyl, represents optionally fluorine-, chlorine-, bromine-, C₁-C₃-haloalkyl-, C₁-C₄-alkyl- or C₁-C₄-alkoxy-substituted phenyl, represents optionally fluorine-,
- 15 chlorine-, bromine-, C₁-C₄-alkyl-, C₁-C₃-haloalkyl- or C₁-C₄-alkoxy-substituted benzyl,
- R⁷ represents C₁-C₆-alkyl, C₃-C₆-alkenyl or C₁-C₆-alkoxy-C₁-C₄-alkyl, or
- R⁶ and R⁷ together represent an optionally methyl- or ethyl-substituted C₄-C₅-alkylene radical in which optionally one methylene group is
- 20 replaced by oxygen or sulphur.
4. Use of a composition according to Claim 1 for controlling insects and/or arachnids, which composition comprises compounds of the formula (I) in which
- W represents hydrogen, chlorine, bromine, methyl, ethyl or methoxy,
- X represents chlorine, bromine, methyl, ethyl, methoxy, ethoxy or
- 25 trifluoromethyl,
- Y represents hydrogen, chlorine, bromine, methyl, ethyl, propyl or trifluoromethyl,

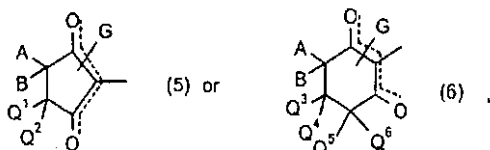
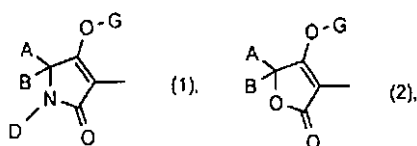
Z represents hydrogen, chlorine, bromine, methyl or represents the radical



5 V¹ represents hydrogen, fluorine, chlorine, methyl, ethyl, methoxy, trifluoromethyl or trifluoromethoxy,

V² represents hydrogen, fluorine, chlorine or methyl,

CKE represents one of the groups



10 A represents hydrogen, in each case optionally fluorine-substituted C₁-C₄-alkyl, C₁-C₂-alkoxy-C₁-C₂-alkyl or C₃-C₆-cycloalkyl,

B represents hydrogen or methyl, or

15 A, B and the carbon atom to which they are attached represent saturated C₅-C₆-cycloalkyl in which optionally one ring member is replaced by oxygen or sulphur and which is optionally monosubstituted by methyl, ethyl, propyl, trifluoromethyl, methoxy, ethoxy, propoxy, butoxy or isobutoxy, or

A, B and the carbon atom to which they are attached represent C₅-C₆-cycloalkyl which is substituted by an alkylenedioxy group which contains

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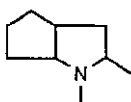
two not directly adjacent oxygen atoms and which, together with the carbon to which they are attached, form a further five- or six-membered ring,

5 D represents hydrogen, C₁-C₄-alkyl, C₃-C₄-alkenyl, C₁-C₂-alkoxy-C₂-C₃-alkyl or C₃-C₆-cycloalkyl,

or

A and D together represent optionally substituted C₃-C₅-alkanediyl in which optionally one carbon atom is replaced by oxygen or sulphur,

10 A and D (in the case of the compounds of the formula (I-1)) together with the atoms to which they are attached represent the group:



AD-1

A and Q¹ together represent C₃-C₄-alkanediyl which is optionally mono- or disubstituted by methyl or methoxy, or

15 Q¹ represents hydrogen,

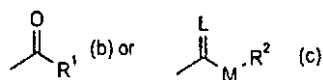
Q² represents hydrogen,

Q⁴, Q⁵ and Q⁶ independently of one another represent hydrogen or methyl,

Q³ represents hydrogen, methyl, ethyl or C₃-C₆-cycloalkyl, or

20 Q³ and Q⁴ together with the carbon to which they are attached represent a saturated C₄-C₆-ring which is optionally substituted by methyl or methoxy and in which optionally one ring member is replaced by oxygen,

G represents hydrogen (a) or represents one of the groups



in which

E represents a metal ion equivalent or an ammonium ion,

L represents oxygen and

5 M represents oxygen or sulphur,

R¹ represents in each case optionally fluorine- or chlorine-substituted C₁-C₁₀-alkyl, C₂-C₁₀-alkenyl, C₁-C₄-alkoxy-C₁-C₂-alkyl, C₁-C₄-alkylthio-C₁-C₂-alkyl or optionally fluorine-, chlorine-, methyl-, ethyl- or methoxy-substituted C₃-C₆-cycloalkyl,

10 represents optionally fluorine-, chlorine-, bromine-, cyano-, nitro-, methyl-, methoxy-, trifluoromethyl- or trifluoromethoxy-substituted phenyl,

R² represents in each case optionally fluorine-substituted C₁-C₁₀-alkyl, C₂-C₁₀-alkenyl or C₁-C₄-alkoxy-C₂-C₄-alkyl or

15 represents C₃-C₆-cycloalkyl,

or represents in each case optionally fluorine-, chlorine-, cyano-, nitro-, methyl-, methoxy-, trifluoromethyl- or trifluoromethoxy-substituted phenyl or benzyl.

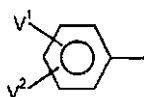
5. Use of a composition according to Claim 1 for controlling insects and/or
20 arachnids, which composition comprises compounds of the formula (I), in which

W represents hydrogen, methyl, ethyl, chlorine or bromine,

X represents chlorine, bromine, methyl, ethyl or methoxy,

Y represents hydrogen, chlorine, bromine, methyl or ethyl,

Z represents hydrogen, chlorine, bromine, methyl, or represents the radical

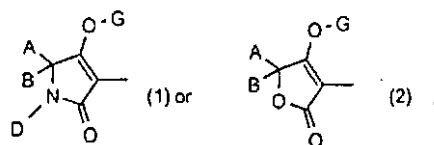


which is located in the para-position to the substituent X,

5 V^1 represents fluorine, chlorine, or trifluoromethyl,

V^2 represents hydrogen, fluorine or chlorine,

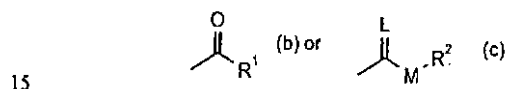
CKE represents one of the groups



10 A, B and the carbon atom to which they are attached represent unsaturated C_3 - C_6 -cycloalkyl in which optionally one ring member is replaced by oxygen and which is optionally monosubstituted by methyl, methoxy, ethoxy, propoxy or trifluoromethyl,

D represents hydrogen,

G represents hydrogen (a) or represents one of the groups



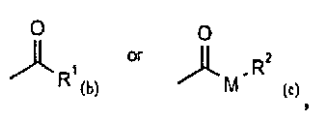
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in which

L represents oxygen and

M represents oxygen or sulphur,

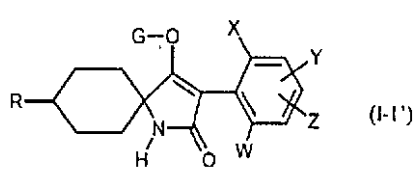
- R¹ represents C₁-C₆-alkyl, C₂-C₆-alkenyl, C₁-C₂-alkoxy-C₁-alkyl, C₁-C₂-alkylthio-C₁-alkyl or represents cyclopropyl or cyclohexyl, each of which is optionally monosubstituted by fluorine, chlorine, methyl or methoxy,
- 5 represents phenyl which is optionally monosubstituted by fluorine, chlorine, bromine, cyano, nitro, methyl, methoxy, trifluoromethyl or trifluoromethoxy,
- R² represents phenyl or benzyl, C₁-C₈-alkyl, C₂-C₆-alkenyl or C₁-C₄-alkoxy-C₂-C₃-alkyl, each of which is optionally mono- to
- 10 trisubstituted by fluorine.
6. Use of a composition according to Claim 1 for controlling insects and/or arachnids, which composition comprises compounds of the formula (I) in which
- W represents hydrogen or methyl,
- 15 X represents chlorine, bromine, methyl or ethyl,
- Y represents hydrogen, chlorine, bromine or methyl,
- Z represents hydrogen, chlorine, bromine or methyl,
- CKE represents the group  (I),
- 20 A, B and the carbon atom to which they are attached represent saturated C₆-cycloalkyl in which optionally one ring member is replaced by oxygen and which is optionally monosubstituted by methyl, trifluoromethyl, methoxy, ethoxy or propoxy,
- G represents hydrogen (a) or represents one of the groups



in which

- M represents oxygen or sulphur,
- R¹ represents C₁-C₆-alkyl, C₂-C₄-alkenyl, methoxymethyl, ethoxymethyl, ethylthiomethyl, cyclopropyl, cyclopentyl, cyclohexyl or phenyl which is optionally monosubstituted by fluorine, chlorine, bromine, methyl, methoxy, trifluoromethyl, trifluoromethoxy, cyano or nitro,
- R² represents C₁-C₆-alkyl, C₂-C₄-alkenyl, methoxyethyl, ethoxyethyl, phenyl or benzyl.

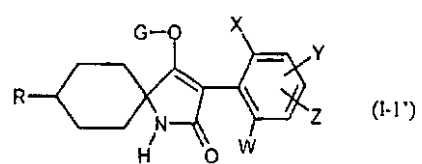
7. Use of a composition according to Claim 1 for controlling insects and/or arachnids, which composition comprises compounds of the formula (I-1'),



in which the radicals are as defined below:

W	X	Y	Z	R	G
CH ₃	C ₂ H ₅	4-Br	H	OCH ₃	H
H	Br	H	5-CH ₃	OCH ₃	CO-i-C ₃ H ₇
H	Br	H	5-CH ₃	OCH ₃	CO ₂ -C ₂ H ₅
H	CH ₃	H	5-CH ₃	OCH ₃	H
H	CH ₃	H	5-CH ₃	OCH ₃	CO ₂ -C ₂ H ₅
CH ₃	CH ₃	H	3-Br	OCH ₃	H
CH ₃	CH ₃	H	3-Cl	OCH ₃	H

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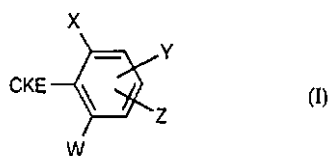


in which the substituents W, X, Y, Z, R and G are as defined below

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The present invention relates to the use of selective insecticidal compositions, characterized in that they comprise an effective amount of an active compound combination comprising

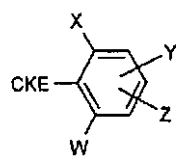
- (a) at least one compound of the formula (I)



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(I)

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(54) СРЕДСТВО НА ОСНОВЕ ЗАМЕЩЕННЫХ ЦИКЛИЧЕСКИХ КЕТОЕНОЛОВ И ЗАЩИТНЫХ ВЕЩЕСТВ, ПРИМЕНЕНИЕ СРЕДСТВА ДЛЯ БОРЬБЫ С НАСЕКОМЫМИ И ПАУКООБРАЗНЫМИ И СПОСОБ БОРЬБЫ С НАСЕКОМЫМИ И/ЛИ ПАУКООБРАЗНЫМИ

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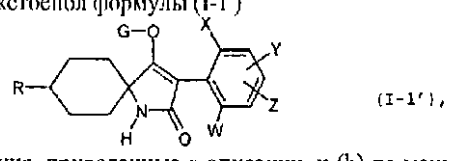
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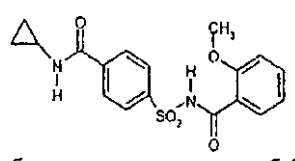
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WO-A-03062244
WO-A-03013249
WO-A-9943649
WO-A-9916744
WO-A-9507897

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(57) Данное изобретение относится к применению средств, содержащих эффективное количество комбинации биологически активных веществ, которые включают (а) по меньшей мере один замещенный циклический кетоенол формулы (I-1'),



где радикалы имеют значения, приведенные в описании, и (b) по меньшей мере одно соединение, улучшающее устойчивость культурных растений, выбранное из группы, включающей клоквиптоцет-мексил, изоксадифен-этил, мефенпир-диэтил, дихлормид, фурилазол, фенклорим и соединение



для борьбы с насекомыми и паукообразными, а также способ борьбы с насекомыми и/или паукообразными с применением этих средств и средство с эффективным содержанием комбинации биологически активных веществ.

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Изобретение относится к применению средств, содержащих селективную инсектицидную и/или акарицидную действующую комбинацию биологически активных веществ, которые содержат замещенные пиперидиновые кетоспироны, с одной стороны, и как минимум одно соединение, улучшающее устойчивость культурных растений, с другой стороны, для селективной борьбы с насекомыми и/или паукообразными клещами в различных культурах полезных растений, а также к способу борьбы с насекомыми и/или паукообразными и к средству с эффективным содержанием комбинации биологически активных веществ.

Известны фармацевтические свойства 3-арилпиперидин-2,4-дионов (S. Suzuki и др., Chem. Pharm. Bull. 15 1120 (1967)). Кроме того, были синтезированы N-фенилпиперидин-2,4-дионы (R. Schmierer и H. Mildenberger, Liebigs Ann. Chem. 1985, 1095). Биологическое действие этих соединений не было описано.

В EP-A-0262399 и GB-A-2266888 опубликованы соединения с похожей структурой (3-арилпиперидин-2,4-дионы), однако нет сведений об их гербицидном, инсектицидном или акарицидном действии. Известно, что гербицидным, инсектицидным или акарицидным действием обладают производные незамещенных бициклических 3-арилпиперидин-2,4-дионов (EP-A-355599, EP-A-415211 и JP 12-053670), а также производные замещенных моноциклических 3-арилпиперидин-2,4-дионов (EP-A-377893 и EP-A-442077).

Далее известны полициклические производные 3-арилпиперидин-2,4-диона (EP-A-442073), а также производные 1H-арилпиперидин-диона (EP-A-456063, EP-A-521334, EP-A-596298, EP-A-613884, EP-A-613885, WO 94/01997, WO 95/26954, WO 95/20572, EP-A-0668267, WO 96/25395, WO 96/35664, WO 97/01535, WO 97/02243, WO 97/36868, WO 97/43275, WO 98/05638, WO 98/06721, WO 98/25928, WO 99/16748, WO 99/24437, WO 99/43649, WO 99/48869 и WO 99/55673, WO 01/17972, WO 01/23354, WO 01/74770, WO 03/062244, WO 04/007448, WO 04/024688, WO 04/080962, WO 04/065366, WO 04/111042, DE-A-10351646, DE-A-10354628, DE-A-10354629, DE-A-10351647).

Известно, что определенные замещенные производные Δ^3 -дигидрофуран-2-она обладают гербицидными свойствами (см. DE-A-4014420). Синтез производных тетраеновой кислоты, используемых в качестве исходных соединений (таких, как, например, 3-(2-метилфенил)-4-гидроксип-5-(4-фторфенил)- Δ^3 -дигидрофуранон-(2)), также описан в DE-A-4014420. Соединения с аналогичной структурой без сведений об инсектицидной и/или акарицидной эффективности известны из публикации Campbell и др., J. Chem. Soc., Perkin Trans. 1, 1985, (8) 1567-76. Кроме того, известны производные 3-арил- Δ^3 -дигидрофуранона с гербицидными, акарицидными и инсектицидными свойствами (см. EP-A-528156, EP-A-0647637, WO 95/26345, WO 96/20196, WO 96/25395, WO 96/35664, WO 97/0153, WO 97/02243, WO 97/36868, WO 98/05638, WO 98/25928, WO 99/16748, WO 99/43649, WO 99/48869, WO 99/55673, WO 01/23354, WO 01/74770, WO 03/062244, WO 04/024688 и WO 04/080962). Также известны производные 3-арил- Δ^3 -дигидротрифенона (WO 95/25345, 96/25395, WO 97/01535, WO 97/02243, WO 97/36868, WO 98/05638, WO 98/25928, WO 99/16748, WO 99/43649, WO 99/48869, WO 99/55673, WO 01/17972, WO 01/23354, WO 01/74770, WO 03/062244, WO 04/080962, WO 04/111042).

Известны не замещенные в фенильном кольце производные фенилпирона (см. A.M. Chirazi, T. Kappe и E. Ziegler, Arch. Pharm. 309, 558 (1976) и K.-H. Boltze и K. Heidenbluth, Chem. Ber. 91, 2849), причем для этих соединений не приведено сведений о возможной применимости в качестве средства для борьбы с вредителями. Замещенные в фенильном кольце производные фенилпирона с гербицидными, акарицидными и инсектицидными свойствами описаны в EP-A-588137, WO 96/25395, WO 96/35664, WO 97/01535, WO 97/02243, WO 97/16436, WO 97/19941, WO 97/36868, WO 98/05638, WO 99/43649, WO 99/48869, WO 99/55673, WO 01/17972, WO 01/74770, WO 03/062244, WO 04/080962, WO 04/111042.

Известны определенные не замещенные в фенильном кольце производные 5-фенил-1,3-тиазина (см. E. Ziegler и E. Steiner, Monatsh. 95, 147 (1964), R. Ketcham, T. Kappe и E. Ziegler, J. Heterocycl. Chem. 10, 223, 1973), причем для этих соединений не приведено сведений о возможном применении в качестве средства для борьбы с вредителями. Замещенные в фенильном кольце производные 5-фенил-1,3-тиазина с гербицидным, акарицидным и инсектицидным действием описаны в WO 94/14785, WO 96/02539, WO 96/35664, WO 97/01535, WO 97/02243, WO 97/36868, WO 99/05638, WO 99/43649, WO 99/48869, WO 99/55673, WO 01/17972, WO 01/74770, WO 03/062244, WO 04/080962, WO 04/111042.

Известно, что определенные замещенные 2-арилциклопентандионы обладают гербицидными, инсектицидными и акарицидными свойствами (см., например, US-4 283348; US-4338122; US-4436666; US-4526723; US-4551547; US-4632698; WO 96/01798; WO 96/03366, WO 97/14667, а также WO 98/39281, WO 99/43649, WO 99/48869, WO 99/55673, WO 01/17972, WO 01/74770, WO 03/062244, WO 04/080962, WO 04/111042). Кроме того, известно похожее замещенное соединение 3-гидроксип-5,5-диметил-2-фенилциклопент-2-ен-1-он из публикации Micklefield и др., Tetrahedron, (1992), 7519-26, а также природное вещество инволутин (-)-пир-5-(3,4-дигидроксифенил)-3,4-дигидроксип-2-(4-гидроксифенил)циклопент-2-енон из публикации Edwards и др., J. Chem. Soc. S., (1967), 405-9. Инсектицидное или акарицидное действие не описано. Кроме того, известен 2-(2,4,6-триметилфенил)-1,3-индандион из публикаций J. Economic Entomology, 66, (1973), 584 и из DE-A 2361084, со сведениями о гербицидной и акарицидной активности. Известно, что определенные замещенные 2-арилциклогександионы обладают гербицидными, инсектицидными и акарицидными свойствами (US-4175135, US-4209432, US-4256657, US-4256658,

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US-4613617, US-4659372, DE-A 2813341, а также Wheeler, T.N., J. Org. Chem. 44., 4906 (1979), WO 99/43649, WO 99/48869, WO 99/55673, WO 01/17972, WO 01/74770, WO 03/062244, WO 04/080962, WO 04/111042).

Известно, что определенные замещенные 4-арилпиразолидин-3,5-дионы обладают акарицидными, инсектицидными и гербицидными свойствами (см., например, WO 92/16510, EP-A-508126, WO 96/11574, WO 96/21652, WO 99/47525, WO 01/17351, WO 01/17352, WO 01/17353, WO 01/17972, WO 01/17973, WO 03/028466, WO 03/062244, WO 03/062244, WO 04/080962).

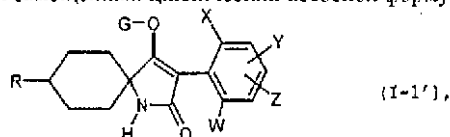
Кроме того, описаны селективные гербициды на основе замещенных циклических кетенолов и защитных веществ (WO 03/013249).

Переносимость этих соединений в особенности однодольными культурными растениями, однако, не при всех условиях достаточно удовлетворительна.

Неожиданно было открыто, что определенные замещенные циклические кетенолы при совместном применении с описанными далее соединениями, улучшающими переносимость гербицидов культурными растениями (защитные вещества/антидоты), отчасти хорошо препятствуют повреждению культурных растений и особенно предпочтительно могут быть использованы в качестве компонентов комбинационных препаратов с широким действием для селективной борьбы с насекомыми также и в однодольных культурах, таких как, например, зерновые культуры, а также в кукурузе, просе и рисе.

Предметом изобретения является применение селективных инсектицидных и/или акарицидных средств, содержащих эффективное количество комбинации биологически активных веществ, которая включает в качестве компонентов:

(а) по меньшей мере один замещенный циклический кетенол формулы (I-1')

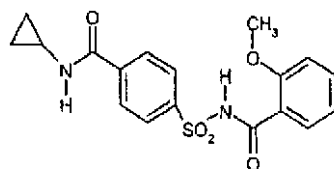


где радикалы имеют следующие значения:

W	X	Y	Z	R	G
CH ₃	C ₂ H ₅	4-Br	H	OCH ₃	H
H	Br	H	5-CH ₃	OCH ₃	CO-изо-C ₃ H ₇
H	Br	H	5-CH ₃	OCH ₃	CO ₂ -C ₂ H ₅
H	CH ₃	H	5-CH ₃	OCH ₃	H
H	CH ₃	H	5-CH ₃	OCH ₃	CO ₂ -C ₂ H ₅
CH ₃	CH ₃	H	3-Br	OCH ₃	H
CH ₃	CH ₃	H	3-Cl	OCH ₃	H
H	Br	4-CH ₃	5-CH ₃	OCH ₃	CO-изо-C ₃ H ₇
H	CH ₃	4-Cl	5-CH ₃	OCH ₃	CO ₂ -C ₂ H ₅
CH ₃	CH ₃	4-CH ₃	3-CH ₃	OCH ₃	H
CH ₃	CH ₃	H	3-Br	OC ₂ H ₅	CO-изо-C ₃ H ₇
H	CH ₃	4-CH ₃	5-CH ₃	OC ₂ H ₅	CO-н-C ₃ H ₇
H	CH ₃	4-CH ₃	5-CH ₃	OC ₂ H ₅	CO-изо-C ₃ H ₇
H	CH ₃	4-CH ₃	5-CH ₃	OC ₂ H ₅	CO-цикло-C ₃ H ₅

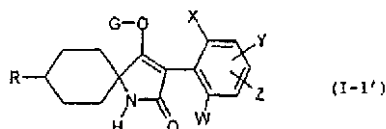
включая все возможные таутомерные формы соединений общей формулы (I) и все возможные соли, соответственно, аддукты с кислотами, соответственно, основаниями соединений общей формулы (I-1') и

(б) по меньшей мере одно соединение, улучшающее устойчивость культурных растений, выбранное из группы, включающей флуквиптоцет-метил, изоксацифен-этил, мефенпир-диэтил, дихлормид, фури-лазол, фенхлорим и соединение



для борьбы с насекомыми и паукообразными.

Соединения формулы (I-1')



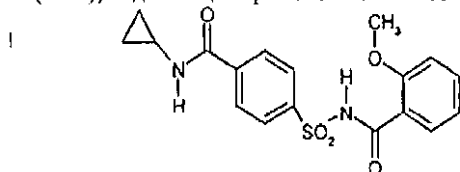
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в которой радикалы имеют следующие значения:

Пример n	W	X	Y	Z	R	G	Известны из
I-1'-1	CH ₃	C ₂ H ₅	4-Br	H	OCH ₃	H	WO 97/02243; I-1-a-40
I-1'-2	H	Br	H	3-CH ₃	OCH ₃	CO-изо- C ₃ H ₇	WO 98/05638; I-1-b-33
I-1'-3	H	Br	H	5-CH ₃	OCH ₃	CO ₂ -C ₂ H ₅	WO 98/05638; I-1-c-22
I-1'-4	H	CH ₃	H	5-CH ₃	OCH ₃	H	WO 98/05638; I-1-a-4 WO 04/007448; I-a-1
I-1'-5	H	CH ₃	H	5-CH ₃	OCH ₃	CO ₂ -C ₂ H ₅	WO 98/05638; I-1-c-4 WO 04/007448; I-c-1
I-1'-6	CH ₃	CH ₃	H	3-Br	OCH ₃	H	WO 97/36868; I-1-a-17
I-1'-7	CH ₃	CH ₃	H	3-Cl	OCH ₃	H	WO 97/36868; I-1-a-2
I-1'-8	H	Br	4- CH ₃	3-CH ₃	OCH ₃	CO-изо- C ₃ H ₇	WO 97/01535; I-1-b-54
I-1'-9	H	CH ₃	4-Cl	3-CH ₃	OCH ₃	CO ₂ -C ₂ H ₅	WO 97/01535; I-1-c-18
I-1'- 10	CH ₃	CH ₃	4- CH ₃	3-CH ₃	OCH ₃	H	WO 97/36868; I-1-a-4
I-1'- 11	CH ₃	CH ₃	H	3-Br	OC ₂ H ₅	CO-изо- C ₃ H ₇	WO 01/89300; I-10
I-1'- 12	H	CH ₃	4- CH ₃	3-CH ₃	OC ₂ H ₅	CO-н-C ₃ H ₇	WO 97/01535; I-1-b-25
I-1'- 13	H	CH ₃	4- CH ₃	3-CH ₃	OC ₂ H ₅	CO-изо- C ₃ H ₇	WO 97/01535; I-1-b-22
I-1'- 14	H	CH ₃	4- CH ₃	3-CH ₃	OC ₂ H ₅	CO-цикло- C ₃ H ₅	WO 97/01535; I-1-b-34

Соединения формулы (I-1') известны, в принципе, из приведенных в начале публикаций или могут быть получены способами, которые описаны там.

Соединение формулы (IIe-5), подлежащее применению в качестве защитного вещества



известно и/или может быть получено известными способами (см. WO-A-99/66795/US-A-6251827).

Неожиданно было обнаружено, что описанные выше комбинации биологически активных веществ, которые содержат соединения общей формулы (I-1') и защитные вещества (антидоты) из приведенной выше группы (b), при очень хорошей устойчивости их полезными растениями проявляют хорошую инсектицидную и/или акарицидную эффективность и могут быть применены в различных культурах растений, более предпочтительно в зерновых культурах (прежде всего в пшенице и ячмене), а также в просе, кукурузе и рисе для селективной борьбы с насекомыми.

При этом следует считать неожиданным, что из большого числа известных защитных веществ или

антидотов, которые способны устранять повреждающее действие гербицидов на культурные растения, именно приведенные выше соединения группы (b) способны почти полностью устранить повреждающее действие, оказываемое на культурные растения замещенными циклическими кетенолами формулы (I), не оказывая при этом отрицательного воздействия на инсектицидную и/или акарицидную эффективность.

Далее, полностью неожиданным оказалось то, что соединения из приведенной выше группы (b) способны не только почти полностью устранить повреждающее действие, оказываемое на культурные растения замещенными циклическими кетенолами формулы (I), но при этом также еще и частично повысить инсектицидную и/или акарицидную эффективность замещенных циклических кетенолов формулы (I) так, что можно говорить о синергическом эффекте.

Наиболее предпочтительна при этом особенно хорошая эффективность компонентов комбинации из группы (b), в особенности в связи со слабым действием на растения зерновых культур, таких как, например, пшеница, ячмень и рожь, а также просо, кукуруза и рис, в качестве культурных растений.

Комбинации биологически активных веществ можно использовать, например, в культурах следующих растений.

Двудольные культуры родов: *Gossypium*, *Glycine*, *Beta*, *Daucus*, *Phaseolus*, *Pisum*, *Solanum*, *Linum*, *Ipomoea*, *Vicia*, *Nicotiana*, *Lycopersicon*, *Arachis*, *Brassica*, *Lactuca*, *Cucumis*, *Cucurbita*, *Helianthus*.

Однودольные культуры родов: *Oryza*, *Zea*, *Triticum*, *Hordeum*, *Avena*, *Secale*, *Sorghum*, *Panicum*, *Saccharum*, *Ananas*, *Asparagus*, *Allium*.

Применение комбинаций биологически активных веществ, однако, ни в коем случае не ограничивается этими родами, а распространяется в равной мере и на другие растения.

Предпочтительный эффект устойчивости культурных растений комбинации биологически активных веществ особенно сильно проявляется при определенных концентрационных соотношениях. Однако весовые соотношения биологически активных веществ в комбинациях биологически активных веществ могут варьироваться в широких интервалах. Как правило, на 1 вес.ч. биологически активного вещества формулы (I) или его соли приходится 0,001-1000 вес.ч., предпочтительно 0,01-100 вес.ч., более предпочтительно 0,05-10 вес.ч. и еще более предпочтительно 0,07-1,5 вес.ч. одного из соединений, обозначенных выше через (b), улучшающих устойчивость культурных растений (антидоты/защитные вещества).

Биологически активные вещества, соответственно, комбинации биологически активных веществ могут быть переведены в обычные препараты, такие как растворы, эмульсии, порошки для опрыскивания, суспензии, порошки, распыляемые средства, пасты, растворимые порошки, грануляты, суспензионно-эмульсионные концентраты, природные или синтетические вещества, пропитанные биологически активным веществом, а также мелкие капсулы в полимерных веществах.

Эти препараты получают известными способами, например при смешивании биологически активных веществ с наполнителями, т.е. с жидкими растворителями и/или с твердыми носителями, при необходимости, с применением поверхностно-активных средств, т.е. эмульгаторов и/или диспергирующих средств, и/или пенообразующих средств.

В случае использования воды в качестве наполнителя могут быть также использованы, например, органические растворители в качестве вспомогательных средств для растворения. В качестве жидких растворителей имеют в виду в существенной мере ароматические соединения, такие как ксилол, толуол или алкилнафталины, хлорированные ароматические соединения и хлорированные алифатические углеводороды, такие как хлорбензолы, хлорэтилены или метилхлорид, алифатические углеводороды, такие как циклогексан или парафины, например фракции нефти, минеральные и растительные масла, спирты, такие как бутанол или гликоль, а также их простые и сложные эфиры, кетоны, такие как ацетон, метилэтилкетон, метилэтилкетон или циклогексанон, сильно полярные растворители, такие как диметилформамид и диметилсульфоксид, а также воду.

В качестве твердых носителей имеются в виду, например, аммониевые соли и помолы природных горных пород, такие как каолин, глиноземы, тальк, мел, кварц, аттапульгит, монтмориллонит или диатомовая земля, и помолы синтетических камней, такие как высокодисперсная кремниевая кислота, оксид алюминия и силикаты, в качестве носителей для гранулятов имеются в виду, например, измельченные и фракционированные природные горные породы, такие как кальцит, мрамор, пемза, селенит, доломит, а также синтетические грануляты из помолов неорганических и органических материалов, а также грануляты из органического материала, такого как древесные опилки, скорлупа кокосовых орехов, кукурузные початки и стебли табака; в качестве эмульгирующих и/или пенообразующих средств имеются в виду, например, неионогенные и анионные эмульгаторы, такие как эфиры полиоксизтилена с жирной кислотой, эфиры полиоксизтилена с жирным спиртом, например алкиларилполиглицеколевый эфир, алкилсульфонаты, алкилсульфаты, арилсульфонаты, а также гидролизаты яичного белка; в качестве диспергирующих средств имеются в виду, например, лигнин-сульфитовые щелоки и метилцеллюлоза.

В препаратах могут использоваться адгезионные средства, такие как карбоксиметилцеллюлоза, природные или синтетические, порошкообразные, зернистые или латексной формы полимеры, такие как гуммиарабик, поливиниловый спирт, поливинилпирролидон, а также природные фосфолипиды, такие как кефалины и лецитины, и синтетические фосфолипиды. Другими добавками могут быть минеральные и рас-

тительные масла.

Могут быть использованы красители, такие как неорганические пигменты, например оксид железа, оксид титана, ферроциан синий, и органические красители, такие как ализариновые, азо- и металлфталопиридиновые красители и следовые количества питательных веществ, таких как соли железа, марганца, бора, меди, кобальта, молибдена и цинка.

Препараты содержат, как правило, от 0,1 до 95 вес.% биологически активных веществ, включая защитные биологически активные вещества, более предпочтительно от 0,5 до 90 вес.%.

Комбинации биологически активных веществ применяют, как правило, в виде препаратов, готовых к применению. Однако биологически активные вещества, входящие в состав комбинаций биологически активных веществ, могут находиться в виде препаратов отдельных веществ, которые сменяют перед применением, т.е. получают смеси, приготавливаемые в больших резервуарах, которые применяют. Комбинации биологически активных веществ могут применяться как таковые, так и в виде их препаратов также в смеси с другими известными гербицидами, причем опять же возможны готовые препараты или смеси, приготавливаемые в больших резервуарах. Возможны также смеси с другими известными биологически активными веществами, такими как фунгициды, инсектициды, акарициды, нематодциды, аттрактанты, стериланты, бактерициды, вещества, защищающие от поедания птицами, вещества, регулирующие рост растений, питательные для растений вещества и средства, улучшающие структуру почвы. Для определенных целей применения, в частности в случае послевсходовой обработки, может оказаться предпочтительным введение в препараты в качестве дальнейших добавок минеральных или растительных масел, переносимых растениями (например, имеющийся в продаже препарат "ракобиол"), или аммониевых солей, таких как, например, сульфат аммония или роданид аммония.

Комбинации биологически активных веществ могут применяться сами по себе, в виде их препаратов или в виде полученных при дальнейшем разбавлении форм, готовых для применения, таких как готовые для применения растворы, суспензии, эмульсии, порошки, пасты и грануляты. Применение осуществляют обычным способом, например, поливанием, опрыскиванием, разбрызгиванием, рассыпанием или рассыпанием.

Расходное количество комбинаций биологически активных веществ может варьироваться в определенном интервале; оно зависит среди прочего от погоды и от почвенных условий. Как правило, расходное количество составляет от 0,005 до 5 кг на 1 га, более предпочтительно от 0,01 до 2 кг на 1 га, еще более предпочтительно от 0,05 до 1,0 кг на 1 га.

Комбинации биологически активных веществ могут наноситься до и после всходов, т.е. предвсходовым и послевсходовым способами.

Применяемые защитные вещества в зависимости от их свойств могут использоваться для предварительной обработки семенного материала культурного растения (протравливание семян) или вноситься перед посевом в посевную борозду, или применяться совместно с гербицидом перед всходами или после всходов семян.

Комбинации биологически активных веществ пригодны для борьбы с животными-вредителями, в частности с артроподами и нематодами, более предпочтительно с насекомыми и паукообразными, которые встречаются в сельском хозяйстве, влияют на здоровье зверей в лесах, представляют угрозу запасам урожая и материалам и встречаются в секторе гигиены. Они эффективны по отношению к нормально чувствительным и устойчивым видам, а также по отношению ко всем или отдельным стадиям развития. К упомянутым выше вредителям относятся следующие.

Виды отряда изопода (Isopoda), такие как, например, *Oniscus asellus*, *Armadillidium vulgare*, *Porcellio scaber*.

Виды отряда диплопода (Diplopoda), такие как, например, *Blaniulus guttulatus*.

Виды отряда хилопода (Chilopoda), такие как, например, *Geophilus carpophagus*, *Scutigera* spp.

Виды отряда симфила (Symphyla), такие как, например, *Scutigerebella immaculata*.

Виды отряда тисанура (Thysanura), такие как, например, *Lepisma saccharina*.

Виды отряда коллембола (Collembola), такие как, например, *Onychiurus armatus*.

Виды отряда ортоптера (Orthoptera), такие как, например, *Acheta domesticus*, *Gryllotalpa* spp., *Locusta migratoria migratorioides*, *Melanoplus* spp., *Schistocerca gregaria*.

Виды отряда Blattaria (Blattaria), такие как, например, *Blatta orientalis*, *Periplaneta americana*, *Leucophaea maderae*, *Blattella germanica*.

Виды отряда дермаптера (Dermaptera), такие как, например, *Forficula auricularia*.

Виды отряда изоптера (Isoptera), такие как, например, *Reticulitermes* spp.

Виды отряда фтиранптера (Phthiraptera), такие как, например, *Pediculus humanus corporis*, *Haematopinus* spp., *Linognathus* spp., *Trichodectes* spp., *Danalinia* spp.

Виды отряда тизаноптера (Thysanoptera), такие как, например, *Hercinothrips femoralis*, *Thrips tabaci*, *Thrips palmi*, *Frankliniella occidentalis*.

Виды отряда гетероптера (Heteroptera), такие как, например, *Eurygaster* spp., *Dysdercus intermedius*, *Piesma quadrata*, *Cimex lectularius*, *Rhodnius prolixus*, *Triatoma* spp.

Виды отряда гомоптера (Homoptera), такие как, например, *Aleurodes brassicae*, *Berisia tabaci*, *Trialeu-*

rodes vaporariorum, Aphis gossypii, Brevicoryne brassicae, Cryptomyzus ribis, Aphis fabae, Aphis pomi, Eriosoma lanigerum, Hyalopterus arundinis, Phylloxera vastatrix, Pemphigus spp., Macrosiphum avenae, Myzus spp., Phorodon humuli, Rhopalosiphum padi, Empoasca spp., Eusecelis bilobatus, Nephrotettix cincticeps, Lecanium corni, Saissetia oleae, Laodelphax striatellus, Nilaparvata lugens, Aonidiella aurantii, Aspidiotus hederae, Pseudococcus spp., Psylla spp.

Виды отряда лепидоптера (Lepidoptera), такие как, например, Pectinophora gossypiella, Bupalus piniarius, Cheimantobia brumata, Lithocolletis blancardella, Hyponomeuta padella, Plutella xylostella, Malacosoma neustria, Euproctis chrysorrhoea, Lymantria spp., Bucculatrix thurberiella, Phyllocnistis citrella, Agrotis spp., Euxoa spp., Feltia spp., Earias insulana, Heliothis spp., Mamestra brassicae, Panolis flammea, Spodoptera spp., Trichoplusia ni, Carpocapsa pomonella, Pieris spp., Chilo spp., Pyrausta nubilalis, Ephestia kuehniella, Galleria mellonella, Tineola bisselliella, Tinea pellionella, Hofmannophila pseudospretella, Cacoecia podana, Capua reticulana, Choristoneura fumiferana, Clysia ambiguella, Homona magnanima, Tortrix viridana, Cnaphalocerus spp., Oulema oryzae.

Виды отряда колеоптера (Coleoptera), такие как, например, Anobium punctatum, Rhizopertha dominica, Bruchidius obtectus, Acanthoscelides obtectus, Hylotrupes bajulus, Agelastica alni, Leptinotarsa decemlineata, Phaedon cochleariae, Diabrotica spp., Psylliodes chrysocephala, Epilachna varivestis, Atomaria spp., Oryzaephilus surinamensis, Anthonomus spp., Sitophilus spp., Otiorrhynchus sulcatus, Cosmopolites sordidus, Ceuthorrhynchus assimilis, Hypera postica, Dermestes spp., Trogoderma spp., Anthrenus spp., Attagenus spp., Lyctus spp., Meligethes aeneus, Ptinus spp., Niptus hololeucus, Gibbium psyllodes, Tribolium spp., Tenebrio molitor, Agriotes spp., Conoderus spp., Melolontha melolontha, Amphimallon solstitialis, Costelytra zealandica, Lissorhoptrus oryzophilus.

Виды отряда гименоптера (Hymenoptera), такие как, например, Diprion spp., Hoplocampa spp., Lasius spp., Monomorium pharaonis, Vespa spp.

Виды отряда диоптера (Diptera), такие как, например, Aedes spp., Anopheles spp., Culex spp., Drosophila melanogaster, Musca spp., Fannia spp., Calliphora erythrocephala, Lucilia spp., Chrysomyia spp., Cuterebra spp., Gastrophilus spp., Hyppobosca spp., Stomoxys spp., Oestrus spp., Hypoderma spp., Tabanus spp., Tannia spp., Bibio hortulanus, Oscinella frit, Phorbia spp., Pegomyia hyoscyami, Ceratitis capitata, Dacus oleae, Tipula paludosa, Hylemyia spp., Liriomyza spp.

Виды отряда сифонаптера (Siphonaptera), такие как, например, Xenopsylla cheopis, Ceratophyllus spp.

Виды класса арахнида (Arachnida), такие как, например, Scorpio maurus, Latrodectus mactans, Acarus siro, Argas spp., Ornithodoros spp., Dermanyssus gallinae, Eriophyes ribis, Phyllocoptura oleivora, Boophilus spp., Rhipicephalus spp., Amblyomma spp., Hyalomma spp., Ixodes spp., Psoroptes spp., Chorioptes spp., Sarcoptes spp., Tarsonemus spp., Bryobia praetiosa, Panonychus spp., Tetranychus spp., Hemitarsonemus spp., Brevipalpus spp.

К нематодам, паразитирующим на растениях, относятся, например, Pratylenchus spp., Radopholus similis, Ditylenchus dipsaci, Tylenchulus semipenetrans, Heterodera spp., Globodera spp., Meloidogyne spp., Aphelenchoides spp., Longidorus spp., Xiphinema spp., Trichodorus spp., Bursaphelenchus spp.

Комбинации биологически активных веществ далее при применении в качестве инсектицидов могут содержать в имеющихся в продаже препаратах, а также в приготовленных из этих препаратов формах, готовых для применения, примесь синергистов. Синергистами являются соединения, с помощью которых повышается эффективность биологически активных веществ, причем добавляемый синергист сам по себе может быть неактивным.

Содержание биологически активного вещества в готовых для применения формах, приготовленных из имеющихся в продаже препаратов, может варьироваться в широком интервале. Концентрация биологически активного вещества в формах, готовых для применения, может составлять от 0,0000001 до 95 вес.% биологически активного вещества, более предпочтительно от 0,0001 до 1 вес.%.

Применение осуществляют обычным способом, приспособленным к форме препарата, готового к применению.

Согласно данному изобретению можно обрабатывать растения целиком или части растений. При этом под растениями понимают все растения и популяции растений, такие как желательные и нежелательные дикие и культурные растения (включая встречающиеся в природе культурные растения). Культурные растения могут быть растениями, полученными традиционными методами выращивания и оптимизирования или методами биотехнологии и генной инженерии или комбинацией этих методов, включая трансгенные растения и включая сорта растений, защищенные и незащищенные законом по защите сортов. Под частями растений следует понимать все надземные и подземные части и органы растений, такие как побег (отросток), лист, цветок и корень, причем, включаются, например, листья, иголки, стебли, стволы, цветы, плоды и семена, а также корни, клубни, корневища. К частям растения относят также товарный продукт урожая, а также вегетативный и генеративный материал для размножения, например черенки, клубни, корневища, отводки и семена.

Обработка согласно данному изобретению растений или частей растений биологически активными веществами происходит непосредственно или путем воздействия на их окружающую среду, место обитания или складские помещения обычными методами обработки, например путем окунания, опрыскива-

ния, обработки паром, распыления, рассеивания, нанесения, впрыскивания, а в случае материала для размножения, в особенности семян, путем формирования на них одно- или многослойных оболочек.

Как уже упоминалось выше, согласно данному изобретению можно обрабатывать растения целиком или их части. В предпочтительном варианте осуществления изобретения обрабатываются встречающиеся в диком виде или полученные путем традиционных биологических методов выращивания, таких как скрещивание или слияние протопластов, виды растений и сорта растений, а также их части. В другом предпочтительном варианте исполнения обрабатываются трансгенные растения и сорта растений, которые получены методами генной инженерии в случае необходимости в комбинации с традиционными методами (генетически модифицированные организмы) и их части. Понятие "части" и "части растений" пояснялись выше.

Особенно предпочтительно обрабатывают согласно данному изобретению имеющиеся в продаже или обычно применяемые сорта растений.

В зависимости от видов или сортов растений, их месторасположения и условий произрастания (почвы, климат, вегетационный период, питание) могут встречаться в результате обработки согласно данному изобретению также сверхаддитивные ("синергические") эффекты. Так, например, возможны уменьшение расходных количеств и/или расширение спектра воздействия и/или усиление эффективности применяемых согласно данному изобретению веществ и средств, лучший рост растений, повышенная толерантность к сухости или к содержанию солей в воде и почве, повышенная продуктивность цветения, облегчение уборки урожая, ускорение созревания, повышение размеров урожая, улучшенное качество и/или повышенная пищевая ценность продукта урожая, повышенная устойчивость при хранении и/или обрабатываемость, которые превышают собственно ожидаемые эффекты. К предпочтительным, обрабатываемым согласно данному изобретению трансгенным (полученным с помощью генно-инженерных технологий) растениям или сортам растений, относятся все растения, которые получены путем генно-инженерных модификаций генетического материала, что придало этим растениям особенно выгодные ценные свойства ("Traits"). Примерами таких свойств являются лучший рост растений, повышенная толерантность к высоким или низким температурам, повышенная толерантность к сухости или к содержанию солей в воде и почве, повышенная продуктивность цветения, облегчение уборки урожая, ускорение созревания, повышение размеров урожая, улучшенное качество и/или повышенная пищевая ценность продукта урожая, повышенная устойчивость при хранении и/или обрабатываемость продукта урожая. Другими и особенно выдающимися примерами таких свойств является повышенная защита растений от животных и микробных вредителей, таких как насекомые, клещи, фитопатогенные грибы, бактерии и/или вирусы, а также повышенная толерантность растений к некоторым гербицидным биологически активным веществам. В качестве примера трансгенных растений упоминаются важные культурные растения, такие как зерновые (пшеница, рис), кукуруза, соя, картофель, хлопчатник, рапс, а также фруктовые растения (с такими плодами, как яблоки, груши, цитрусы и виноград), причем, особенно выделяются кукуруза, соя, картофель, хлопчатник и рапс. В качестве свойств ("Traits") особенно подчеркивается повышенная защита растений от насекомых с помощью образующихся в растениях токсинов, особенно таких, которые продуцируются в растениях посредством генетического материала из *Bacillus Thuringiensis* (например, через гены CryIA(a), CryIA(b), CryIA(c), CryIIA, CryIIIA, CryIIIB2, Cry9c, Cry2Ab, Cry3Bb и CryIF, а также их комбинаций) (далее "Bt-растения"). В качестве свойств ("Traits") далее особенно подчеркивается повышенная толерантность растений к некоторым гербицидным биологически активным веществам, например имидазолинонам, сульфонилмочевинам, глифосате или фосфинотрицину (например, "PAT"-ген). Гены, придающие соответствующие желаемые свойства ("Traits"), в трансгенных растениях могут встречаться в комбинации друг с другом. В качестве примеров "Bt-растений" следует назвать сорта кукурузы, хлопчатника, сои и картофеля, которые продаются под торговыми названиями YIELD GARD® (например, кукуруза, хлопчатник, соя), KnockOut® (например, кукуруза), StarLink® (например, кукуруза), Bollgard® (хлопчатник), Nicotin® (хлопчатник) и NewLeaf® (картофель). В качестве примера толерантных к гербицидам растений следует назвать сорта кукурузы, хлопчатника и сои, которые продаются под торговыми названиями Roundup Ready® (толерантность к глифосате, например, кукуруза, хлопчатник, соя), Liberty Link® (толерантность к фосфинотрицину, например, рапс), IMI® (толерантность к имидазолинону) и STS® (толерантность к сульфонилмочевине, например, кукуруза). В качестве резистентных к гербицидам растений (обычно выращенных на толерантности к гербицидам) следует упомянуть сорта, которые продаются под названием Clearfield® (например, кукуруза). Само собой разумеется, эти высказывания также действительны для сортов, которые будут разработаны в будущем и появятся в будущем на рынке сортов растений с этими или новыми, разработанными в будущем, свойствами ("Traits").

Приведенные растения можно особенно предпочтительно обработать согласно данному изобретению смесями биологически активных веществ. Предпочтительные области, приведенные выше для смесей, справедливы и для обработки этих растений. Особенно предпочтительна обработка растений смесями, специально приведенными в последующем тексте.

012504

Примеры применения.

Метод: испытание защитных веществ после опрыскивания

Растворитель: 7 вес.ч. ДМФ (диметилформамид).

Эмульгатор: 2 вес.ч. алкиларилполиглицевого эфира.

Для получения целесообразного готового препарата биологически активного вещества смешивают 1 вес.ч. биологически активного вещества с приведенными количествами растворителя и эмульгатора и разбавляют концентрат водопроводной водой до необходимой концентрации. Заданное количество защитного вещества (в случае метфенпирдиэтил в виде WP 20) смешивают с водой, предназначенной для разбавления. Затем добавляют 2 г а.и./л метилового эфира рапсового масла 500 EW. Листья озимого ячменя на стадии 2 листьев, которые поражены листевой вошью зерновых культур (*Rhopalosiphum padi*), обрабатывают раствором заданной концентрации биологически активного и защитного вещества с помощью опрыскивателя (балкенипритц), причем расходное количество воды составляет 300 л/га. Для каждого варианта проводится как минимум два повтора. Обработку результатов проводят согласно 7d и/или 14d, оценивая повреждение растений в процентах и умерщвление листовых вшей, выраженное в процентах по отношению к необработанному контролю. При этом 100% повреждения означает, что растение погибло, и 0% означает отсутствие повреждения. Эффективность в 100% в случае листовых вшей зерновых культур означает, что все листовые вши зерновых культур умерщвлены; 0% означает, что ни одна листовая вошь не умерщвлена (а.и. = активный ингредиент).

Ниже приведены результаты парниковых опытов с защитными веществами после опрыскивания с целью борьбы с *Rhopalosiphum padi* в яровом ячмене/озимом ячмене.

	Расходное количество, г а.и./га	Умерщвление (% согласно 7d	Повреждения (%)	
			согласно 7d,	14d
Пример I-1'-1	40	70	80	90
Пример I-1'-1 + метфенпир-диэтил	40 + 100	97	50	40
Метфенпир-диэтил	100	0	0	0

	Расходное количество, г а.и./га	Умерщвление (%) согласно 7d	Повреждения на новом приросте (%)	
			по 7d	по 14d
Пример I-1'-1	40	70	100	100
Пример I-1'-1 + метфенпир-диэтил	40 + 100	97	30	0
Метфенпир-диэтил	100	0	0	0

Формула расчета степени умерщвления, вызванного воздействием комбинации двух биологически активных веществ.

Ожидаемая эффективность для заданной комбинации двух биологически активных веществ может быть рассчитана по формуле Колби (см. Colby, S.R., Calculating Synergistic and Antagonistic Responses of Herbicide Combinations", Weeds 15, с. 20-22, 1967) следующим образом: если

X означает степень умерщвления при использовании биологически активного вещества А с расходным количеством m (г/га) или концентрацией m (млн. доли),

Y означает степень умерщвления при использовании биологически активного вещества В с расходным количеством n (г/га) или концентрацией n (млн. доли),

E означает степень умерщвления при использовании биологически активных веществ А и В с расходными количествами m и n (г/га) или концентрацией m и n (млн. доли), то тогда

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

Если фактическое инсектицидное умерщвление больше расчетного, то это означает, что комбинация по своему умерщвлению сверхаддитивна, т.е. имеет место синергический эффект. В этом случае фактически наблюдаемая степень умерщвления должна быть больше, чем величина, рассчитанная по приведенной выше формуле для ожидаемой степени умерщвления (E).

Примеры по применению опрыскивания.

Растворитель: вода.

Активизирующая добавка: метиловый эфир рапсового масла (0,1% а.и./л).

012504

Для получения целесообразного раствора для применения смешивают 1 вес.ч. препарата с соответствующим количеством воды и активизирующей добавки и разбавляют концентрат водой до необходимой концентрации.

Пример А. Тест на *Aphis gossypii*.

Растения хлопчатника (*Gossypium herbaceum*), которые сильно поражены листевой вшой хлопчатника (*Aphis gossypii*), опрыскивают раствором, готовым к применению, заданной концентрации до образования капель влаги.

Пример В. Тест на *Metopolophium dirhodum*.

Растения ячменя (*Hordeum vulgare*), которые сильно поражены листевой вшой зерновых культур (*Metopolophium dirhodum*), опрыскивают раствором, готовым к применению, заданной концентрации до образования капель влаги.

Пример С. Тест на *Myzus persicae*

Растения красного стручкового перца (*Capsicum sativum*), которые сильно поражены зеленой вшой листьев персика (*Myzus persicae*), опрыскивают раствором, готовым к применению, заданной концентрации до образования капель влаги.

Через заданное время определяют умерщвление в процентах (%). При этом 100% означает, что все листовые вши умерщвлены; 0% означает, что ни одна листовая вошь не умерщвлена. Измеренные величины умерщвления затем используют в расчетах по формуле Колби.

При этих тестах показывают, например, следующие комбинации биологически активных веществ согласно данному изобретению синергически усиленную эффективность по сравнению с суммой эффективностей биологически активных веществ, применяемых по отдельности.

Таблица А

Насекомые, повреждающие растения			
Тест на <i>Aphis gossypii</i>			
препарат	Концентрация в или. долях	Степень умерщвления в (%) согласно 7d	
Пример (I-1'-5)	20	30	
SC 240			
Изоксадифен-этил WG 50	50	0	
Пример (I-1'-5)	+	наб.*	расч.**
Изоксадифен-этил (1:2,5)	20 + 50	50	30
Согласно изобретению			
Мефенпир-диэтил WG 15	100	0	
Пример (I-1'-5)	+	наб.*	расч.**
Мефенпир-диэтил (1:5)	20 + 100	55	30
Согласно изобретению			
Пример (IIa-5) а.и.	100	0	
Пример (I-1'-5)	+	наб.*	расч.**
(Пример IIa-5)	20 + 100	50	30
Согласно изобретению			
Клоквинтоцет-мексил 20	WP 100	5	
Пример (I-1'-5)	+	наб.*	расч.**
Клоквинтоцет-мексил (1:5)	20 + 100	70	33,5
Согласно изобретению			
Дихлормид а.и.	100	0	
Пример (I-1'-5)	+	наб.*	расч.**
Дихлормид (1:5)	20 + 100	55	30
Согласно изобретению			

* наб. = наблюдаемая эффективность,
** расч. = эффективность, рассчитанная по формуле Колби.

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Таблица В

Насекомые, повреждающие растения
Тест на *Metopolophium dirhodum*

Препарат	Концентрация в млн. долях	Степень умерщвления в (%) согласно 7 ^d	
Пример (I-1'-5)	20	15	
SC 240			
Изоксадифен-этил WG 50	25	0	
Пример (I-1'-5)	+	наб.*	расч.**
Изоксадифен-этил (1:1,25)	20 + 25	35	15
Согласно изобретению			
Пример (IIe-5)	100	0	
Пример (I-1'-5)	+	наб.*	расч.**
(Пример IIe-5) (1:5)	20 + 100	35	15
согласно изобретению			
Дихлоранид а.и.	100	0	
Пример (I-1'-5)	+	наб.*	расч.**
Дихлоранид (1:5)	20 + 100	40	15
согласно изобретению			
Фенклорим а.и.	25	0	
Пример (I-1'-5)	+	наб.*	расч.**
Фенклорим (1:1,25)	20 + 25	35	15
согласно изобретению			

* наб. = наблюдаемая эффективность,
** расч. = эффективность, рассчитанная по формуле Колби.

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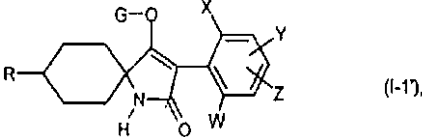
Таблица С

Насекомые, повреждающие растения			
Muzus persicae - Test			
Препарат	Концентрация	Степень умерщвления	
	В млн. долях	в % согласно 7 ^d	
Пример (I-1'-5)	20	0	
8С 240			
Мефенпир-диэтил WG 15	100	5	
Пример (I-1'-5)	+	наб. *	расч. **
Мефенпир-диэтил (1:5)	20 + 100	35	5
Согласно изобретению			
Пример (IIe-5)	100	5	
Пример (I-1'-5)	+	наб. *	расч. **
(пример IIe-5) (1:5)	20 + 100	70	5
согласно изобретению			
Клоквинтоцет-мексил	WP 25	0	
20			
Пример (I-1'-5)	+	наб. *	расч. **
Клоквинтоцет-мексил	20 + 25	80	0
(1:1,25)			
согласно изобретению			
Дихлорнид а.и.	100	0	
Пример (I-1'-5)	+	наб. *	расч. **
Дихлорнид (1:5)	20 + 100	94	0
согласно изобретению			
Фенклорим а.и.	50	0	
Пример (I-1'-5)	+	наб. *	расч. **
Фенклорим (1:2,5)	20 + 50	90	0
согласно изобретению			
Фурилазол а.и.	50	0	
Пример (I-1'-5)	+	наб. *	расч. **
Фурилазол (1:2,5)	20 + 50	87,5	0
согласно изобретению			

* наб. = наблюдаемая эффективность,
 ** расч. = эффективность, рассчитанная по формуле Колби.

ФОРМУЛА ИЗОБРЕТЕНИЯ

1. Применение средства, содержащего эффективное количество комбинации биологически активных веществ, которое включает:
 (а) по меньшей мере один замещенный циклический кетенол формулы (I-1')



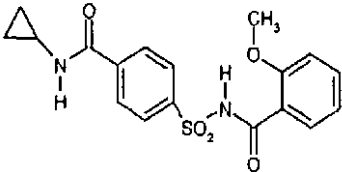
где радикалы имеют следующие значения:

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W	X	Y	Z	R	G
CH ₃	C ₂ H ₅	4-Br	H	OCH ₃	H
H	Br	H	5-CH ₃	OCH ₃	CO-изо-C ₃ H ₇
H	Br	H	5-CH ₃	OCH ₃	CO ₂ -C ₂ H ₅
H	CH ₃	H	5-CH ₃	OCH ₃	H
H	CH ₃	H	5-CH ₃	OCH ₃	CO ₂ -C ₂ H ₅
CH ₃	CH ₃	H	3-Br	OCH ₃	H
CH ₃	CH ₃	H	3-Cl	OCH ₃	H
H	Br	4-CH ₃	5-CH ₃	OCH ₃	CO-изо-C ₃ H ₇
H	CH ₃	4-Cl	5-CH ₃	OCH ₃	CO ₂ -C ₂ H ₅
CH ₃	CH ₃	4-CH ₃	3-CH ₃	OCH ₃	H
CH ₃	CH ₃	H	3-Br	OC ₂ H ₅	CO-изо-C ₃ H ₇
H	CH ₃	4-CH ₃	5-CH ₃	OC ₂ H ₅	CO-н-C ₃ H ₇
H	CH ₃	4-CH ₃	5-CH ₃	OC ₂ H ₅	CO-изо-C ₃ H ₇
H	CH ₃	4-CH ₃	5-CH ₃	OC ₂ H ₅	CO-цикло-C ₃ H ₅

включая все возможные таутомерные формы соединений общей формулы (I) и все возможные соли, соответственно, аддукты с кислотами, соответственно, основаниями соединений общей формулы (I-1'), и

(b) по меньшей мере одно соединение, улучшающее устойчивость культурных растений, выбранное из группы, включающей кляквинтонетмексил, изоксадифенэтил, мефенпирдиэтил, дихлормид, фурилазол, фенклорим и соединение

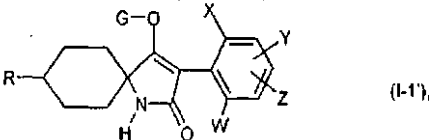


для борьбы с насекомыми и паукообразными.

2. Способ борьбы с насекомыми и/или паукообразными (клещами), отличающийся тем, что средство, указанное в п.1, наносят на насекомых и/или паукообразных и/или на места их обитания.

3. Средство с эффективным содержанием комбинации биологически активных веществ, которое включает:

(a) по меньшей мере одно соединение формулы (I-1')



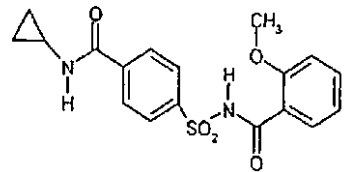
где заместители W, X, Y, Z, R и G имеют значения, приведенные ниже

W	X	Y	Z	R	G
CH ₃	C ₂ H ₅	4-Br	H	OCH ₃	H
H	Br	H	5-CH ₃	OCH ₃	CO-изо-C ₃ H ₇
H	Br	H	5-CH ₃	OCH ₃	CO ₂ -C ₂ H ₅
H	CH ₃	H	5-CH ₃	OCH ₃	H
H	CH ₃	H	5-CH ₃	OCH ₃	CO ₂ -C ₂ H ₅
CH ₃	CH ₃	H	3-Br	OCH ₃	H
CH ₃	CH ₃	H	3-Cl	OCH ₃	H
H	Br	4-CH ₃	5-CH ₃	OCH ₃	CO-изо-C ₃ H ₇
H	CH ₃	4-Cl	5-CH ₃	OCH ₃	CO ₂ -C ₂ H ₅
CH ₃	CH ₃	4-CH ₃	3-CH ₃	OCH ₃	H
CH ₃	CH ₃	H	3-Br	OC ₂ H ₅	CO-изо-C ₃ H ₇
H	CH ₃	4-CH ₃	5-CH ₃	OC ₂ H ₅	CO-н-C ₃ H ₇
H	CH ₃	4-CH ₃	5-CH ₃	OC ₂ H ₅	CO-изо-C ₃ H ₇
H	CH ₃	4-CH ₃	5-CH ₃	OC ₂ H ₅	CO-цикло-C ₃ H ₅

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и

(b) по меньшей мере одно соединение, улучшающее устойчивость культурных растений, выбранное из группы, включающей клоквинтоцетмексил, изоксадифенэтил, мефенпирдиэтил, дихлормид, фурилазол, фенклорим и соединение



4. Средство по п.3, содержащее соединение формулы (1-1'), где

W	X	Y	Z	R	G
H	CH ₃	H	5-CH ₃	OCH ₃	CO ₂ -C ₂ H ₅



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