CAVELIER ABOGADOS COLO 00361-841-184-1 10.115942

LA
Industria Comerc10 NIENDENCIA DE INDUSTRIA Y COMERCIO

U P E R I N T E N D E N C I A No. 08-000417. -00000-0000

Fecha: 2008-01-03 16:20:59 Dep. 2020 NUECREACIONt Ira. 11 PATENTEIYJI Eve: 378 FASENACONALl Act. 411 PRESENTACION Folios: 121
FORMULARIO UNICO DE SOLICITUD DE PATENTE
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SOLICITUD DE: OI1 Patente de Invenciôn. El Patente de Modelo de Utilidad.
IEI Capitulo 1. El CapItulo Ii.

(D Nombre: BASF AKTIENGESELLSCHAFT

sociedad constituida existente de acuerdo IDENTIFICACION

SOLICITANTE con las leyes de Alemania C.C. 0 NIT El (71)
DirecciOn: 67056 Ludwigshafen G.E. El Otro El
Alemania Cual

Domicilio: Ludwigshafen, Alemania Nümero

Nombre: EMILIO FERRERO IDENTIFICACION

Direccion: Carrera 43 No. 72-35 G.C. IJ NIT El
REPRESENTANTE

TelØfono: 347 36 11
G.E. El Otro 0
OAPODERADO Fax: 2118650
Cual E-mail: clientes(camy.com.
Domicilio:Bogota,Colombia. NUmero 438.019 T.P 31.929

1. Douglas D. ANSPAUGH 2. Nigel ARMES O 4007 Winecott Drive, 8001 Kukui Court,

Apex, Raleigh,

INVENTOR (ES) Carolina del Norte 27502, Carolina del Norte 27613,
(72) Estados Unidos de America Estados Unidos de America
3. David G. KUHN 4. Hassan OLOUMI-SADEGHI
1208 Dalgarven Drive, 12105 Pawley’s Mill Circle,
Apex, Raleigh,
Carolina del Norte 27502, Carolina del Norte 27614,
Estados Unidos de America Estados Unidos de America

0 PCT (86)

Solicitud Internacional No. PCT/EP2006/062714 Fecha: 30demayode2006
Publicaciôn Internacional No. WO 2006/128863Al Fecha: 7dediciembrede2006

TItuto (54)
MEZCLASPESTICIDAS

0 Clasificación Internacional (51) A0IN037/052

Prioridad (33) Pais deOrigen (32) Fecha
US 3 de lunio de 2005

_(31)NümerodeSolicitud

’IEISI NOD ,.60/687,111

Comprobante de pago No.: 08-160 Fecha: 2deenerode2008

CAVELIER ABOGADOS

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COLO 00361-841-184-1 10.115942

Anexos:

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Comprobante de pago de la tasa por presentaciOn de la solicitud.
Comprobante de pago por reivindicaciôn de prioridad.
Documento que acredita la existencia y representaciOn legal cuando el solicitante sea persona juridica.
Poderes, si fuere el caso.
Documento de cesiOn del inventor al solicitante o a su causante.
Declaraciones.
Copia de la solicitud internacional. (Resumen, descripción, reivindicaciones, dibujos) Traducciôn de la solicitud internacional al casteHano. (Resumen, descripciOn, reivindicaciones, dibujos)
Copia del examen preliminar efectuado por la IPEA.
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De ser el caso, copia del contrato de acceso.
De ser el caso, documento que acredite la licencia o autorizaciOn de uso de conocimientos tradicionales de las comunidades indIgenas.
De ser el caso, certificado de depOsito del material biolOgico.
Arte final 12x12
De ser el caso, informaciOn sobre otras solicitudes de patente o tItulos obtenidos en el extranjero por el mismo titular o su causante, relacionadas parcial o totalmente con Ia invención de esta solicitud.
Otros: VER HOJA DOCUMENTOS ANEXOS

FIGURA CARACTERISTICA

Solicito la concesión de Ia patente,
NOMBRE: EMILIO FERRERO

FIRMA:
C.C. 438.019 de UsaauØn T.P. 31.929 JGG

AlON.Y PODER \

e-h6tros), abajo firmado (s) -

domlclllado(s) en..LUdig.h,fe...Rep4b.]4

por el presente nombrainos a GEUMAN CAVELIER, tpa. 832; GONZALO PERDOMO, tpa. 831; ERNES9 CAVQLtER, tpa. 11810; y EMILIO FEBBERO, tpa

31929;. douilclllados en in Carters 4-N° 72-33, Eogoth, olombla, en obedeclmlento a to diapuesto an at paræ- grafo 10 del Articuio 843 del Códlgo de Comerelo, 1’

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su orden, como nuestros representantet todos los asuntos de propiedad Industrial con facultad pare reelbir

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tie Colombia, en ci extranjero; y at se tratare do fin-

pedimento, con ci certificado respeetivo. BI alguno do ’ los nombrados faiare detinitivdmente, el sigulento to-
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Id competencia desleal, a çuyo efecto autorlzo (amos) a lo diction apoderados pa quo me (floe) representen ante cualeaquiera entidacle o personas, ejerzan o no jurisdIcctón, especlalrnente Ins del orden adminis-
trativo, eonteneiosd-admlæl rativo y judicial, en todo Ic concerniente a los siguienf i asuntos: a) Obtenclón do patentee do Invenclôn, mo doe y’ dlbujos Industrlaies; ci reglatro tie mercaz tie f rfca, coiectivaa, defensivas y do servlclçu; ci depóalto do nombree comdrclales 7

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Dado i firmado hoy

(PlfrPatente, Model. end Zelclmungun.WatceI4 /und ServiaWen Handelalamen-und-aetciien)

VERTRETUNG UND V&LMACfl

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de Alemsnia

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LIER, tpa. 812; GONZALO PERfl0MO, tpa.’831; ER-
NESTO CAVELIER tpa. 11519; EMUJIO RREEOP
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lrma BASF Aktiengesellschaftt Ludigshafen. am Rhein ;k4e.1Uden Herren.,

Gte W el Z el, themikr
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e thrren Dr. We1e1 und Dr. R.ibters sind mix’ personii4

a-uf 1-jeut iger EinsLcbtnahme in das Handeleregister
tveim.I4mtsgex’icht Ludwigshafen am Rhein HR B’3000 be-i-einigo ich, daB die Herren Dr. We1ze1nd Dr. Ricbters Prokuriten gemeinsçhaft1ic1 zur Vertretung und
Zihnung dcx’ Firma. BASF Aktiengesellschaft mit dem
in Ludwigshatetiam Rhein berechtigt. sind.

:tdwigsharei am Rhein, den V1 MArz 1989

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Mender Unterschrift des I4otarassessorS

Thomas Walter

ai: mitiich best it r Vertreter des Notars Justizrat Dr. Kohler
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Quo ci seflor Thomas Walter---------..............................
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Poder precedente, ejercIa las fin.1one.:iitdia43.
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. Presidente del Tribunal Regional
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(Franz Serfas)

(ello redondo:)
El Pregidente del Tribunal Regional
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EN ESPAiOL: La legalizacion de las firmas anteriores pr k
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' CAVEUER
ABOGADOS
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Estado de North Carolina))s.s.:
Condado de Durham)

todos los derechos inherentes a dicha invendon y

que la antes mencionada compafta queda facultada por Is presente Cesion para soficitar en su

nombre la corresponcfiente soilcitud de patente en
la RepUblica de Colombia

Yo, Deborah Martin, un Notario PUbtico para la junsdicciOn anteriormente nombrada, por el presente certifico que Nigel Armes compareció personalmente ante ml este dia y reconoció la debida suscripciOn del instrumento anterior.

Da fe mi firma y sello oficial este dla 22 de Mayo de 2006.

(Firmado)
Firma del Notario PUbtico
Deborah Martin
Sello Notarial: DEBORAH MARTIN, NOTARIO PUBLICO, CONDADO DE DURHAM, N.C., Mi comision expira 10-13-2009.

Mi Comisión expira Octubre 13, 2009.

CERTIFICACION DE NOTARIO
ESTADO DE NORTH CAROLINA

Yo, Willie L Covington, Registrador de Escrituras del antedicho Condado y Estado, por el presente certifico que Deborah Martin, en el momento de firmer este documento era un Notario Publico
debidamente comisionado en y para el Condado de Durham, Estado de North Carolina.
En testimonio de 10 cual estampo mi firma y mi sello oficial Hoy dla 31 de Mayo 2006
W1LLI L. COVINGTON
, Registrador de Escrituras
Por (Firmado) Deborah Moms Registrador de Escrituras, Encargado

DEPARTAMENTO DE ESTADO SECRETARIA DE ESTADO

ODE NORTH CAROLINA
APOSTILLA (ConvenciOn de La Haya del 5 de Octubre de 1961)

1. Pais: Estados Unidos de America

2. Este documento pciblico ha sido suscrito por Deborah Moms
3. Obrando en calidad de Registrador de Escrituras Encargado
4. Lleva el sello/estampilla de Willie L.. Covington, Registrador de Escrituras, Condado de
Durham, North Carolina

Certificada

6. el 6 de Jun10, 2006
Encargado de la Secretarla de Estado de

5 en Raleigh, North Carolina

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7. por el Secretario de Estado

DE JUST

INTERpRETE FCAL
RES. No. 323 ORE MIN.

8. Estado de North Carolina
8 No. 13366
9. Sello Estampilla
10

Estado de North Carolina

Condado de Durham

Firma
(Firmado) Elaine F. Marshal
Secretario de Estado

Yo, Deborah Martin, un Notarlo PCiblico para Is jurisdicción anteriormente nombrada, par el presente certifico qua Douglal D. Anspaughôornparecló perpia1mente ante mi este dia y reconociô la debida suscripciOn del instrumento anterior.

Da fe mi firma y sello oficial este dla 23 de Mayo de 2006.

(Firmado)
Firma del Notano Püblico
Deborah Martin
Sello Notarial: DEBORAH MARTIN, NOTARIO PUBLICO, CONDADO DE DURHAM, N.C., Mi comisión expira 10-13-2009.

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MI Comisión expira Octubre 13,2009.

CERTIFICACION DE NOTARIO I
ESTADO DE NORTH CAROLINA

Yo, Willie L. Covington, Registrador de Escrituras del antedichb Cndadb Es par
el presente certifico que Deborah Mthtin, en el momento de firmar este documenera uRNotab Publico debidamente comisionado en pars el Condado de Durham, Estado de North Cdlina. Ln
En testimonio de to cual estampo mi firma ml sello oficial Hoy dIa 31 de Mayo 2006
WILLI L. COV1NGTON

Registrador de Escrituras
Por (Firmado) Deborah Moms Registrador de Escrituras, Encargado

DEPARTAMENTO DE ESTADO SECRETARIA DE ESTADO
DE NORTH CAROLINA

APOSTILLA (Convención de La Hays del5 Oe Octubre de 1961)

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en Raleigh, North Carolina
el 6 de Junio, 2006
par el Secretario de Estado Encargado de Ia Secretarla de Estado de Estado de North Carolina
No. 13367

Sello Estampilla
Firma
(Firmado) Elaine F. Marshal
Secretario de Estado

Estado de North Carolina

Condado de Durham

LDA kGUILEFA Ut--

Yo, Deborah Martin, un Notarlo P(iblico para la jurlsdicciôn anteriormente nombrada, por el presente certifico que David G. Kuhn comparecio personalmente ante mi este dia y reconoclO la debida suscripciOn del instrumento anterior.

Da fe ml firma y sello oficial este dla 17 de Mayo de 2006.

(Firmado)
Firma del Notarlo PUblico
Deborah Martin
Sello Notarial: DEBORAH MARTIN, NOTARIO PCJBLICO, CONDADO DE DURHAM, N.C., Mi comisión expira 10-13-2009. ...

Mi ComisiOn expira Octubre 13 200?

CERTIFICACION DE NOTARIO
ESTADO DE NORTH CAROLINA

Yo, Willie L. Covington,. Registrador de Escrituras del antedicho Condado Estado, por
el presente certifico que Deborah Martin, en el momento de firmar este documento era un Notario Publico debidamente comisionado en pare el Condado de Durham Estado de North Carolina.
En testimonlo de lo cual estampo mi firma mi sellooficial Hoy dla 31 de Mayo 2006
WILLI L. COVINGTON.
Registrador de Escrituras
Por (Firmado) Deborah Moms Registrador de Escrituras, Encargado

DEPARTAMENTO DE ESTADO SECRETARIA DE

DE NORTH CAROLINA 9 APOSTILLA(Convencion de La Haya del 5 de Octubre de 1961) C)
1. Pals: Estados Unidos de Amorica

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4. Lleva el sello/estampilla de Willie L.. Covington, Registrador de Escritura o?fado di
Durham, North Carolina .-
Certificàda
5 en Raleigh, North Carolina
6 el 6 de Junio, 2006
7 por el Secretario de Estadocargado de la Secretarla de Estado de
Estado de North Carolina
8 No. 13368
9. Sello Estampilla
10 Firma

(Firmado) Elaine F. Marshal co Secretario de Estado
Estado de North Carolina
)s.s.:
Condado de Durham

Yo, Deborah Martin, un Notarlo PUblico pare Ia jurlsdiccion anterlormente nombrada, por el presente certifico que Hassan Oloumi-Sadeghi comparecio personalmente ante mi este dia reconociô la debida

suscripciôn del instrumento anterior.

Da fe ml firma y sello oficial este dla 17 de Mayo de 2006.

(Firmado)
Firma del Notarlo PUblico
Deborah Martin

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Sello Notarial: DEBORAH MARTIN, NOTARIO PUBLICO, CONDADO DE DURHAM, N.C., Mi comision

expire 10-13-2009. ’:1) Mi Comision expire Octubre 13, 2009.
CERTIFICACION DE NOTARIO
ESTADO DE NORTH CAROLINA

Yo, Willie L. Covingtn, Registrador de Escrituras del antedicho Condado y Estado, par
el presente cerhfico que Deborah MaI1en el morientode firmar este documento era un Notano Publico debidamente comisionado en y par qondadoeun,.Estado de North Carolina.
En testimonio de Ia cual estampo æ*firia ml sello öficiàL Hoy dla 31 de Mayo 2006
WILLI L. COVINGTON

Registrador de Escrituras
Por (Firmado) Deborah Moms Registrador de Escrituras, Encargado

DEPARTAMENTO DE ESTADO SECRETARIA DE ESTADO
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(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) ’World Intellectual Property Organization

International Bureau 0I iiiH 11111 VII 11111 VII II 11111 11111 IHI liii 11111 lIliIIlI 11111111 V

(43) International Publication Date (10) International Publication Number
7 December 2006 (07.12.2006) PCT WO 2006/128863 Al

(51) International Patent Classification:
AOIN 37/52 (2006.01) AOIN 51/00(2006.01)
AOIP 7/00(2006.01) AOIN 47/34(2006.01)
AOIN 53/00(2006.01)

(21) International Application Number:
PcT/EP2006/062714

(22) International Filing Date: 30 May 2006 (30.05.2006)

(25) Filing Language: English

(26) Publication Language English

(30) Priority Data:
60/687,111 3 June 2005 (03.06.2005) US

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(54) Title: PESTICIDAL MIXTURE

(74) Common Representative: BASF Aktiengesellschaft; 67056 Ludwigshafen (DE).

(81) Designated States (unless otherwise indicated for every kind ofnational protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CM, CO, CR, CU, Cl DE, DL DM, DZ, EC, EE, EG, ES, F!, GB, GD, GE, GH, GM, HR, RU, ID, IL, IN, IS, 3?, KB, KG, KM, KN, KP, KR, 1(7., LC, LK, LR, LS, IT, LU, IV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, 5K, SL, SM, SY, TJ, TM, TN, TR, U, rL, UA, UG, US, liZ, VC, VN, YU, ZA, ZM, ZW

(84) Designated States (unless otherwise indicated for every kind ofregional protection available): AR]PO (BW, GH, GM, KB, LS, MW, MZ, NA, SD, SL, SZ, TZ, 11G, ZM, ZW), Eurasian (AM, AZ, BY, KG, KB, MD, RU, Ti, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, F!, FR, GB, GR, RU, IB, IS, IT, IT, LU, IV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, Cl. CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
- with international search report

Fortwo-letter codes and other abbreviations, refer to the "Guid-
anceNotes on Codes andAbbreviations" appearing at the begin-
ning ofeach regular issue ofthe PCT Gazette.

(57) Abstract: Pesticidal mixtures comprising, as active components 1) a
compound of the formula I wherein W is CI or C173; X and Y are each in-

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NHR1 dependently CI or Br; R is alkyl, alkenyl, alkynyl, or cycloalkyl optionall

’ NN- substiuted with t13 halogens, or alkyl which is substituted by alkoxy; R - and R are alkyl or may be taken together to form cycloalkyl optionally sub-
R4 stituted by 1 to 3 halogens; R is H or C1-C3-alkyl, or the enantiomers or
R3 salts thereof, and a Compound II selected from organo(thio)phosphates, car-
barnates, pyrethroids, growth regulators, nicotinic receptor agonists/antago-
fists Compounds, GABA antagonist compounds, macrocydic lactone insecticides, MET! I acaricides, MET! II and ifi compounds, uncoupler compounds, oxidative phosphorylation inhibitor compounds, moulting disruptor compounds, mixed function oxidase inhibitor compounds, sodium channel blocker compounds, and other various pesticide compounds. In synergistically effective amounts, methods for the control of insects or acarids by contacting them or their food suppiy, habitat, breeding grounds or their locus with mixtures of the compound I with a compound 11, a method of protecting plants from attack or infestation by insects or acarids employing mixtures ofthe compound I with a compound II, and a process for the preparation of a composition for treating, controlling, preventing or protecting a warm-blooded animal or a fish against infestation or infection by insects or acarids which comprises a pesticidally effective amount of a mixture of the compound! with a compound H.

WO 2006/128863 PCT/EP2006/062714

4

propyl)-malononitrlle, 2,2-BIs-(2,2,3,3,4,4,5,5-octafiuoro-pentyl)-malOflonitrlle, 2-(2,2,3,3,4,4,5,5,5Nonafiuoropentyl)-2-(3,3,3-trifiUOrO-PrOPYl)-maIOflOflitrI1e1 2-(2,2,3,3,4,4,4HeptafiuorobutyI)_2_(2,2,3,3,4,4,5,5-OCtafiUOrO-PefltYl)-malOflOflitrlle
and 2_(2,2,3,3,4,4,5,5_Octafluoro-pentyl)-2-(2,2,3,3,3-pentafiUOrO-PrOPYI)-
5 malononitrile

in synergistically effective amounts.

The present invention also provides methods for the control of Insects or acarids by
10 contacting the insect or acarid or their food supply, habitat, breeding grounds or their
locus with a pesticidally effective amount mixtures of the compound I with a corn-
pound H.

Moreover, the present Invention also relates to a method of protecting plants from at-
415 tack or infestation by insects or acarids comprising contacting the plant, or the soil or
water in which the plant is growing, with a pesticidally effective amount of mixtures of
the compound I with a compound II.

This invention also provides a method for treating, controlling, preventing or protecting
20 an animal against Infestation or infection by parasites which comprises orally, topically
or parenterally administering or applying to the animals a parasiticidally effective
amount of a mixture of the compound I with a compound H.

The Invention also provides a process for the preparation of a composition for treating,
25 controlling, preventing or protecting a warm-blooded animal or a fish against Infestation
or infection by insects or acarids which comprises a pesticidally effective amount of a mixture of the compound I with a compound H.

One typical problem arising in the field of pest control lies in the need to reduce the
30 dosage rates of the active ingredient In order to reduce or avoid unfavorable environ-
mental or toxicological effects whilst still allowing effective pest control.

Another problem encountered concerns the need to have available pest control agents which are effective against a broad spectrum pests.
35

There also exists the need for pest control agents that combine knock-down activity
with prolonged control, that Is, fast action with long lasting action.
Another difficulty In relation to the use of pesticides is that the repeated and exclusive application of an Individual pesticidal compound leads in many cases to a rapid selec-
40 bon of pests which have developed natural or adapted resistance against the active

WO 2006/128863 PCT/EP2006/062714

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compound in question. Therefore there Is a need for pest control agents that help pre-
vent or overcome resistance.

It was therefore an object of the present invention to provide pesticidal mixtures which
5 solve the problems of redUcing the dosage rate and I or enhancing the spectrum of
activity and I or combining knock-down activity with prolonged control and / or to resis-tance management

We have found that this object is in part or in whole achieved by the combination of
10 active compounds defined at the outset Moreover, we have found that simultaneous,
that is joint or separate, application of a compound I and a compound II or successive
application of a compound I and a compound II allows enhanced control of pests com-
pared to the control rates that are possible with the individual compounds.

44 15 Compounds of the formula I, their preparation and their action against insect and acarid

pests are known (EP-BI 604 798).

S The commercially available compounds of the group A may be found in The Pesticide

Manual, 13th Edition, British Crop Protection Council (2003) among other publications.
20 Thiamides of formula r2 and their preparation have been described in WO 98/28279.
Amlnoisothiazole compounds of formula F3 and their preparation have been described
in WO 00/06566. Leplmectin is known from Agro Project, PJB Publications Ltd, No-
vember 2004. Benclothiaz and its preparation have been described in EP-Al 454621.
Methidathion and Paraoxon and their preparation have been described in Farm Chemi-
25 cals Handbook, Volume 88, Meister Publishing Company, 2001. Acetoprole and its
preparation have been described in WO 98/28277. Metaflumizone and its preparation
have been described in EP-Al 462 456. Fiupyrazofos has been described in Pesticide Science 54, 1988, p.237-243 and in US 4822779. Pyrafluprole and its preparation have been described In JP 2002193709 and In WO 01/00614. Pyriprole and its preparation
30 have been described in WO 98/45274 and in US 6335357. Amidoflumet and its prepa-
ration have been described in US 6221890 and in JP 21010907. Flufenerlm and its preparation have been described in WO 03/007717 and in WO 03/007718. Cyflumeto-
fen and Its preparation have been described in WO 04/080180.
Anthrarillamides of formula F4 and their preparation have been described in
35 WO 01/70671; WO 02/48137; WO 03124222, WO 03/15518, WO 04/67528;
WO 04/33468; and WO 05/118552. The malononitrile compounds CF2HCF2CF2CF2CH2C(CN)2CH2CH2CF3 (2-(2,2,3,3,4,4,5,5-octafluoropentyl)-2-(3,3,3-trifluoropropyl)malorionit,iIe), CF3(CH2)2C(CN)2CH2(CF2)5CF2H (2-(21233,4,4,5,566,7,7-Dodecafluoro-heptyl)-2-(3,3,3-t1ifJuoro-propyl).malononithIe)
40 CF3(CH2)2C(CN)2(CH2)2C(CF3)2F (2-(3,4,4,4-Tetrafluoro-3-trifluoromethyl-butyI)-2-

WO 2006/128863 PCTIEP2006/062714

6

(3,3,3-thfluoro-propy-maIononitrlIe), CF3(CH2)2C(GN)2(CH2)2(CF2)3CF3 (2-(3,3,4,4,5,5,6,6,6-Nonafluoro-hexyl)-2-(3!3,3-trifluoro-propyl)-malononlfrlle), CF2H(CF2)3CH2C(CN)2CH2(CF2)3CF2H (2,2-Bis-(2,2,3,3,4,4,5,5-octafluoro-pentyl)- malononitrile), CF3(CH2)2C(CN)2CH2(CF2)3CF3 (2-(2,2,3,3,4,4,5,5,5-Nonafiuoro-pentyl)-
5 2-(3,3,3-trifluoro-propyl)-malononitrile), CF3(CF2)2CH2C(CN)2CH2(CF2)3CF2H (2-
(2,2,3,3,4,4,4-Heptafluoro-butyl)-2-(232,3,3,4,4,5,5-octafiuoro-pentyl)-malononit(le) and CF3CF2CH2C(CN)2CH2(CF2)3CF2H (2-(2,2,3,3,4,4,5,5-Octafluoro-pentyl)-2-(2,2,3,313-pentafiuoro-propyl)-malononitrile) have been described In WO 05/63694.

10 Mixtures, active against pests, of compounds of formula I are described in a general
manner in EP-BI 604 798. The use of pesticidal mixtures, active against certain pests,
of compounds of formula I with some of the compounds of formula Ii are described in PCT/EP/04/01 3687, filed on December 2, 2004 (published’as WO 2005/053403). The favourable synergistic effect of these mixtures is not mentioned in these documents but
15 Is described herein for the first time.

With regard to their use in the pesticidal mixtures of the present invention, the following compounds of formula I are especially preferred:

20 Compounds of formula I wherein
W is trifluoromethyl;
X and V are each Independently chlorine or bromine;
RI is C1-C8-alkyl;
R2 and R3 are Ci-C6-alkyl or may be taken together to form C3-C6-cycloalkyl which is
25 substituted by I to 2 halogen atoms;
R4 is C1-Cs-alkyl;
or the enaritlomers or salts thereof.

Particular preference is given to N-ethyl-2,2-dimethylpropionamide-2-(2,6-dlchloro-
30 a,a,(x-trifluoro-p-tolyl)hydrazone and N-Ethyl-2,2-dichloro-1 -methylcyclopropane-
carboxarnide, 2-(2,6-dichloro-a,cx,cx-trifiuoro-p-tolyl)hydrazone.

Furthermore, particular preference with respect to the use in the inventive mixtures is given to the compound of formula I-I (N-ethyl-2,2-dimethylpropionamide-2-(2,6-
35 dichloro-a,aa-trifiuoro-p-tolyl)-hydrazone):
5H3

Cl HN

’ N)çCH3 I-I

CF’’" 1-13C CH3

3 ’-’I

WO 2006/128863 PCTIEP2006/062714

octafluoropentyl)-2-(3,3,3-trifluoropropyl)malOflOflitrile), CF3(CH2)2C(CN)2CH2(CF2)5CF2H (2(2,2,3,3,4,4,5,5,6,6,7,7-Dodecafluoro-heptyl)-2-(3,3,3-trifluoro-propyi)-malononitrlle), CF3(CH2)2C(CN)2(CH2)2C(CF3)2F (2-(3,4,4,4-Tetrafluoro-3-trifluoromethyi-butyl)-2-(3,3,3-trifluoro-propyl)-maloflOflitrlle),
5 CF3(CH2)2C(CN)2(CH2)2(CF2)3CF3 (2-(3,3,4,4,5,5,6,6,6-Nonafluoro-hexyl)-2-(3,3,3-
trifluoro-propyl)-malononitrile), CF2H(CF2)3CH2C(CN)2CH2(CF2)30F2H (2,2-Bis-(2,2,3,3,4,4,5,5-octafluoro-pentyl)-malononitrile), CF3(CH2)2C(CN)2CH2(CF2)3CF3 (2-(2,2,3,3,4,4,5,5,5-Nonafluoro-pentyl)-2-(3,3,3-t(fluoro-propyl)-maiononitrlle), CF3(CF2)2CH2C(CN)2CH2(CF2)3CF2H (2-(2,2,3,3,4,4,4-Heptafluoro-butyl)-2-
10 (2,2,3,3,4,4,5,5-octafluoro-pentyl)-malononitrile) and CF3CF2CH2C(CN)2CH2(CF2)3CF2H
(2-(2,2,3,3,4,4,5,5-Octafluoro-pentyl)-2-(2,2,3,3,3-pentafluoro-propyl)-malononitrlle), flonicamid, pymetrozine and pyridalyl.

Very preferred compounds of unknown mode of action group A.15. are anthranilamide
15 compounds of formula V.

Also, avery preferred compound of Group A.15 Is the malononitrile compound CF2HCF2CF2CF2CH2C(CN)2CH2CH2CF3 (2-(2,2,3,3,4,4,5,5-octafluoropentyl)-2-(3,3,3-trifluoropropyl)malononitrile. This compound and its preparation is disclosed in WO
20 05/63694.

Moreover, especially preferred with regard to their use according to the present inven-
tion are mixtures wherein the compound of formula II is selected from the groups A.3. (pyrethroids), A.4. (growth regulators), A.5. (nicotinic receptor agonists/antagonists
25 compounds), A.6. (GABA antagonist compounds), A.7. (macrocyclic lactone Insecti-
cides), A.I0.(uncoupler compounds), A.14. (sodium channel blocker compounds), or A.15. (various pesticides).

Most preferred are mixtures wherein the compound of formula Ills selected from the
30 group A-I consisting of bifenthrin, cyhalothrin, cypermethrin, alpha-cypermethrin, del-
tamethrin, Iamda-cyhalothrin, permethrin; flufeno.xuron, hexaflumuron, teflubenzuron, novaluron; clothianidin, acetamiprid, imidacloprid, thiamethoxam; fipronil, ethiprole; abmamectin, emamectin, spinosad; chlorfenapy indoxacarb, metaflumizone; an-thranilamide compounds of formula r4, malononitrfle compounds as described in JP
35 2002 284608, WO 02/89579, WO 02/90320, WO 02190321, WO 04/06677, WO
04/20399, JP 2004 99597, WO 05/68423, WO 05/68432, or WO 05/63694, especially
the malononitrile compounds CF2HCF2CF2CF2CH2C(CN)2CH2CH2CF3 (2-(2,2,3,3,4,4,5,5-octafluoropentyl)-2-(3,3,3-trtfluoropropyl)malononitrile), CF3(CH2)2C(CN)2CH2(CF2)5CF2H (2-(2,2,3,3,4,4,5,5,6,6,7,7-Dodecafiuoro-heptyl)-2-
40 (3,3,3-trtfluoro-propyl)-malononitrlle), CF3(CH2)2C(CN)2(CH2)2C(CF3)2F (2-(3,4,4,4-

WO 2006/128863 PCTIEP2006/062714

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Tetrafluoro-3-trifluoromethyl-butyl)-2-(3,3,3-trifluorO-PrOPYl)-malOnOflltrlle), CF3(CH2)2C(CN)2(CH2)2(CF2)3CF3 (2-(3,3,4,4,5,5,6,6,6-Nonafluoro-hexyl)-2-(3,3,3-trifluoro-propyl)-malononitrlle). CF2H(CF2)3CH2C(CN)2CH2(CF2)3CF2H (2,2-Bis-(2,2,3,3,4,4,5,5-octafluoro-pentyl)-malononitrile), CF3(CH2)2C(CN)2CH2(CF2)3CF3 (2-
5 (2,2,3,3,4,4,5,5,5-Nonafluoro-pentyl)-2-(3,3,3-trifluoro-prOpyl)-malOflOflitrlle),
CF3(CF2)2CH2C(CN)2CH2(CF2)3CF2H (2-(2,2,3,3,4,4,4-Heptafluoro-butyl)-2-(2,2,3,3,4,4,5,5-octafluoro-pentyl)-malononitrile) and CF3CF2CH2C(CN)2CH2(CF2)3CF2H (2(2,2,3,3,4,4,5,5_Octafluoro-pentyl)-2-(2,2,3,3,3-pentafluoro-propyl)-malOflOflitriIe),
flonicamid, pymetrozine and pyridalyl.
10

Synergistic mixtures of the compound of formula I-I: N-ethyl-2,2-dimethylproplonamlde-2-(2,6-dichloro-cz,a,(x-trffluoro-p-tolyl)hydraZOfle with one of the
pesticides of group A are especially preferred.

’ 15 Also especially preferred are synergistic mixtures of the compound of formula 1-2: N-
Ethyl-2,2-dichloro-1 -methylcyclopropane-carboxarnide, 2-(2,6-dIchloro-(,ch,x-trifluoro-p-
tolyl)hydrazone with one of the pesticides of group A.

When preparing the mixtures, it is preferred to employ the pure active compounds I and
20 ii, to which further active compounds, also against harmful fungi or else herbicidal or
growth-regulating active compounds or fertilizers can be added.

The mixtures of compounds I and II, or the compounds I and II used simultaneously,
that. Is jointly or separately, exhibit outstanding action against pests from the following
25 orders:

insects from the order of the lepidopterans (Lepidoptera), for example Agrot/syps//on,
Agrotis segetum, Alabama argillacea, Ant/cars/a gemmatalis, Argyresthia conjugal/a,
Autographa gamma, Bupalus pin/ar/us, Cacoec/a murinana, Capua ret/cu/ana, Chelma-
30 tobia brumata, Choristoneura fum/ferana, Chor/stoneura occidentails, Cirphis

4 un,ouncta, Cydia pomonella, Dendrol/mus p/ni; D/aphania n//Ida/is, Diatraea grandi-

ose//a, Ear/as insulana, Elasmopalpus /,’noseilus, Eupoeclila amb/guella, Eve/la bou-
ilana, Fe/Us subterranea, Gal/er/a malone/la, Grapho/itlia funebrana, Grapho//tha ma-
lesta, He/lath/s ann,era, Hello/h/s virescens, Hello/his zea, He//u/a undalis, Hibernia
35 defol/anfa, Hyphantrla cunea, Hyponomeuta ma//ne//us, Ke/fenla lycopers/cella, Lamb-
c’/Aa fiscellaria, Lap/iygma ex,’ua, Leucoptera coffee/la, Leucoptera sciteila, Lithoco/-
/etis blancardella, Lobes/a botrana, Loxostege st/ct/ca/is, Lyman/na d/spar, Lyman/na monaclia, Lyonetia c/erkel/a, Malacosoma neustnia, Maniestra brassicae, Orgy/a pseu-dotsugata, Os/n/n/a nub//ails, Panoils flammea, Pect/nophora gossyp/eI/a, Per/drama
40 saucla, Pha/era bucephala, Phthorimaea operaulella, Phyioon/stis c//re/la, Pier/s bras-

WO 2006/128863 PCTIEP2006/062714

11

siose, Platbypena scabra, Plutella xy/oste/Ia, Pseudop/usia includens, R/7yacion/a frus-trana, Scrobioa/pula abso/uta, Sitotroga cerea/ella, Sparganothis pifleriana, Spodoptera frugoerda, Spodoptera littoralis, Spodoptera litura, Thaumatopoea pityocampa, Tortr/x vfr/dana, Trichop/usia n/and Zeiraphera canadensis,
5

beetles (Coleoptera), for example Agrilus sinuatus, Agriotes lineatus, Agriotes obscu-
rus, Amphirnallus so/st//falls, Anisandrus dLcpar, Anthonomus grand/s, Anthonomus pomorum, Aphthona euphor/dae, Athous haemorrhoidalis, Atomaria ilnearis, Blasto-phaguspinioerda, Blitophaga undata, Bruchus rufimanus, Bruclius pisorum, Bruchus
10 lent/s1 Bydflscus betulae, Cassida nebulosa, Cerotoma frifurcata, Cetorila aurata,
Ceuthorrhynchus assin//is, Ceuthonhiynchus nap,; C/iaetocnØrna tibia/Is, Conodelus vespemnus, Criocetis asparagi Ctenicera sap., D/abrotlça lOng/corn/a, Diabrot/ca semiunctata, Diabrofica 12-punctata Diabrotica spec/ass, Diabrotica virgifera, Epila-
chna var/vest/s. Ep/trixhirEiiennis, Eutinobothrus brasi//ensis, Hy/obius abietis, Hypera
15 brunne4oenn/s, Hypera post/ca, Ips typographus, Lema b//ineats, Lema melanopus,
Lept/notarsa decern/ineata, Limonius califomicus, L/ssorhoptrus oryzophu/us, Melanotus camniunis, Me/i’ethes aeneus, Me/a/ant/ia hipocastani Mel%ntha me/olontha,
Qu/ema orj’zae, Otiorr/?ynchus su/catus, Otiorriiynchus ovatus, P/iaedon coc/ilear/ae, Phyllobiusp)ql Phyiotreta chrysocephala, Pl7yiophaga sp., Phyiopertha hart/co/a,
20 Phyllofreta nemorum, P/iyllotrota sfriolata, Pop//I/ajapan/ca, Mona llneatus and S/to-
ph//us granaria,

flies, mosquitoes (Diptera), e.g. Aedes aegypti Aedes albopictus, Aedes vexens, An-asfrep/ia ludens, Anopheles maculi;oennfs, Anopheles cruc/ans, Anopheles a/bfrnanus,
25 Anopheles gambiae, Anopheles freebomi, Anopheles leucosphyrus, Anopheles
mus, Anopheles quadthnaculatus, Ca/liphora v/c/na, Cora#& cap/tate, Chrysoniya bezz/ana, Chrysomya homin/vorax, Chrysomya mace//ar/a, Chrysops disca/is,
C/irysops si/acea, Chiysops at/anticus, Cochu/omy/a homh-iivorax, Contathi/a sorghicola Cordy/obla anthropaphaga, Cu/icc/des furens, Culexp4i/ens, Cu/axnirripa/pus, Cu/ax
30 qu/nquefascfatus, Cu/ex tarsal/s. Cu//sofa inomata, Cu//sofa me/anura, Darius cucurbi-
faa, Dacus oleae, Das/neura brass/rise, Della antique, Della coarctafa, Della platura,
Della rad/cum, Dermatob/a horn/nis, Fann/a can/cu/ar/s1 Geornyza Tripunctafa, Gaster-op/i//us /ntest/na//s, Gloss/na mors/fans, Gloss/na pa/pal/s. Gloss/na fusc/pes, Gloss/na tech/no/des, Haematob/a in-Hans, Hap/od4ilosis equestris, H4ipelates Sp,D., Hy/emy/a
35 platura, Hypoderrna /ineata, Leptoconops ton-ens, Lir/omyza safivae, Lfr/omyza trifo/,’Z
Luduia caprina, Lucille cupi*la, Lucilfa serfca/a, Lycoria pectoralls, Mansonla f/U//anus, Mayet/ola destructor, Musca domestica, Muscina stabulans, Oestrus avis, Opornyza forum, Osc/nella Mt, Pegomya hysocyami Phorbia ant/qua, Phorbia brass/rise, Phor-
b/a coarctata, Phiebotomus argentioes, Psorophora co/umb/ae, Ps//a rosae, Psoro-
40 phora disc%r, Pros/mu//urn mb’tum, Rhago/et/s cerasi Rhagoletis pomonella, Sar-

WO 2006/128863 PCTIEP2006/062714

12

cophaga haemoffholda//s Sarcophaga sp., Sirnuilum vittatuin, Stonioxys ca/cifrans, Tabanus bovinus, Tabanus stratus, Tabanus I/nec/a, and Tabanus sh7l//is, Tipula 0/- eracea, and Tioula pa/udosa

5 thrips (77,ysanoptera), e.g. Dichromothrios corbett, Dichromothrios ssp, Franklin/ella
fusca, Franklin/ella occidental/s3 Franklin/el/a tr/tici Scirtothr,os cifr Thri;os oryzae,
777r4s palm/and Thris tabac,

termites (Isoptera), e.g. Ca/otermes ifsv/co//is, Leucotennes flav,es, Heterotermes
10 aureus, Ret/cu/Hermes ifsvioes, Ret/cu/Hermes v/rginidus, Reticul/tennes luc/fugus,
Termes natalensis, and Coptotermes formosanus,

cockroaches (Blattaria Blattodea), e.g. B/site//a german/ca, Blat/ella asah/nae, Peri-planeta americana, Penolanetajapan/ca, Perilaneta brunnea, Penlaneta fu/i’ginosa,

4t 15 Pen;olaneta australasiae, andB/a/ta or/entails,
true bugs (Hem4tera), e.g. Acrosternurn h//are, Bilssus leucoptenis, Cyrtope/tis no/a-
/us, Dysdercus cingu/atus, Dysdercus intermedius, Eurygasterintegriceps, Eusch/stus /rnpictiventiis, Leptog/ossusphyiopus, Lygus l/neo/arls, Lyguspratens/s, Nezara At/du-
20 /a, Piesma quadrata, Solubea insular/s. Thyantaperd/tor, Acyrthosiohon onobrychis,
Adelges lap/c/s. Aphidula nasturtii Aph/s fabae, Aphis forbesi Aphis pomi Aphis gos-
sypil, Aphis grossu/ar/ae, Aphis schne/deri Aphis sp/raecola, Aphis sambuci Acyrtho-s,ohon p/sum, Aulacorthum solan Bern/s/a argentifol/ Brachycaudus cardul, Brachy-caudus heilchrysi Brachycaudus pers/cae, Brachycaudus prun/cola, Brev/coryne bras-
25 s/cae, Cap/tophorus horn,; Cerosioha gossypiZ Chaetosihon fragaefol//, Cryptomyzus
ribis, Dreyfusia nordmann/enae, Dreyfus/a piceae, Dysaph/s radicola, Dysau/acortbum pseudosolan, Dysaphis plan/ag/flea, Dysaphis py4 Ernpoasca fabae, Hyalopterus
prun/, Hyperomyzus /actucae, Macrosihum avenae, Macros/phum euphorbiae, Ma-cros4ohon rosae, Megoura P/c/se, Me/anaph/s pyrar/us, Metopo/ophium dirhodum, My-
30 ZUS persicae, Myzus asca/on/cus, Myzus cerasi Myzus var/ans, Nasonovia r1b1s-n/gr4
Nilaparvata lugens, Pemphi’us bursar/us, Perkhisiella saccharicida, Phorodon humu/1 Psyila mall, Psyila p/r4 Rhopa/omyzus ascalonicus, Rhopa/osio/ium maid/s. Rhopa/os/- phum pad! Rhopalosiihum /nsertum, Sappaph/s ma/a, Sappaph/s mali; Sch/zaph/s gram/num, Schizoneura /anug/nasa, S/lob/on avenae, Tria/eurodes vaporar/orum,
35 Toxoptera aurant/land, 14teus v/tffoIiZ C/rnex /ectularius, C/rnex hemioterus, Reduv/us
seni//s, Tr/atoma spp., and Arilus cr/ta/us.

ants, bees, wasps, sawflles (Hymenoptera), e.g. At/ia//a rosae, A/ta cephalotes, A/ta capivara, At/a cepha/otes, At/a /aevi’ata, A/ta robusta, At/a sexdens, A/ta texana,
40 Crematogaster Spp., Hoplocampa m/nuta, Hoplocampa testud/nea, Monomorium pha-

WO 2006/128863 PCT/EP2006/062714

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raonis, So/enopsis geminata, Solenopsis inv/cia, Solenopsis richter So/enopsis xylonl. Pogonomyrmex barbatus, Pogonomyrmex californ/cus, P/ia/dole rnegacepha/a, Dasy-mutilla occidentalls, Bombus spp. Vespula squamosa, Paravespula vulgaris, Paraves-
pu/a pennsylvanlca, Paravespula gennanica, Do//chovespu/a macu/ata, Vespa crabro,
5 Pollstes rubiqinosa, Camponotus floridanus, and Linepitlierna humile,

crickets, grasshoppers, locusts (Orthoptera), e.g. Achats domest/ca, G4ry//ota/pa gry/lo-ta/pa, Locusta migratoria, Me/anoplus bMttatus, Me/anop/us fetnuirubrurn, Me/anoplus mex/canus, Me/anop/us sangu/nies, Me/anoplus spretus, Nomadacris septemfasciata,
10 SchiŁtocercaamericana, Schistocerca gregaria, Dociostaurus maroccanus, Tachyc/nes
asynamorus, Oeda/eus senega/ensis, Zonozerus variegatus, Hierog/yphus daganensis, Kraussaria angulifera, Ca/liptamus ita/icus, Chortoicetes terminifera, and Locustana parda/ina,

15 Arachnoidea, such as arachnids (Acarina), e.g. of the families Argasidae, ixodidae and
Sarcoptidae, such as Amblyomma americanum, Amb/yornma variegatum, Ambryoinma macu/atum, Argaspersicus, s9oophi/us annu/atus, Booph//us deco/oratus, Boop/il/us rn/crop/us, Dermacentors/Ivarum, Dermacentor anderson,; Derinacentor var/sb//is, Hya/omma truncatum, Ixodes ricinus, Ixodes rubicundus, Ixodes scapular/s1 Ixodes
20 ho/ocyclus, Ixodes pacificus, Omitliodorus moubata, Ornithodorus herms, Omithodo-
rus turicata, Omlthonyssus bacot Otobius megn/ni, Dermanyssus ga/llnae, Psoroptes
ovis, Rh4oicephalus sangu/neus, R/woicepha/us append/cu/atus, Rhi;oicepha/us evertsi Sarcoptes scabiel, and Erlophyidae spp. such as Aculus sch/echtenda/i Piiyiocopfrata 0/elvora and Eriophyes sheldont, Tarsonemidae spp. such as Phytonemuspalildus and
25 Po/yphagotarsonemus latus Tenuipalpldae spp. such as Brev4ia/pus phoenici Tetra-
nychidae spp. such as Tetranychus cinnabar/nus, Tetranychus kanzawai, Tetranychus pacificus, Tetranychus telar/us and Tefranychus urticae, Panoriychus ulmi, Panony-
chus citri, and 011gonychus pratensis Araneida, e.g. Latrodectus mactans, and Loxos-ce/es rec/usa,
30

fleas (Siphonaptera), e.g. Ctenocephalldes fells, Ctenocephalldes can/s. Xenopsy//a cheopis, Pu/ax/iT/tans, Tunga penetrans, and Nosopsyllus fasclatus,

silverfish, firebrat (Thysanura), e.g. Lepisma saccharina and Thermobia domest/ca,
35 centipedes (Chilopoda), e.g. Scutiera co/eoptrata,

millipedes (Diplopoda), e.g. Narceus spp.,

Earwigs (Dermaptera), e.g. forficula auricu/aria,
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WO 2006/128863 PCT/EP2006/062714

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lice (Phthiraptera), e.g. Pediculus liumanus cap/ifs, Pediculus hurnanus corporis, Pt/il-rus pub/s, Haematop/nus eurysternus, Haematopinus suis, L/nognat/ius vitu1i Boy/cola boy/s. Menopon ga//mae, Menacanthus sframineus and Solenopotes capi//atus.

Moreover, the inventive mixtures are especially useful for the control of Isoptera, Dip-
tera, Blattaria (Blattodea), Hymenoptera, Siphonaptera, and Acarina.

The mixtures according to the invention or the compounds I and II can be converted
Into the customary formulations, for example solutions, emulsions, suspensions, dusts,
10 powders, pastes and granules. The application form depends on the particular pur-
pose; in each case, it should ensure a fine and uniform distribution of the compound according to the invention.

The formulations are prepared in a known manner, for example by extending the active
15 compound with solvents and/or carriers, if desired using emulsifiers and dispersants.
Solvents/auxiliaries which are suitable include:

water, aromatic solvents (for example Solvesso products, xylene), paraffins (for
example mineral fractions), alcohols (for example methanol, butanol, pentanol,
benzyl alcohol), ketones (for example cyclohexanone, gamma-butyrolactone),
20 pyrrolidones (NMP, NOP), acetates (glycol cliacetate), glycols, fatty acid dimethylamides, fatty acids and fatty acid esters. In principle, solvent mixtures
may also be used.
carriers such as ground natural minerals (for example kaolins, clays, talc, chalk)
and ground synthetic minerals (for example highly disperse silica, silicates);
25 emulsifiers such as nonionic and anionic emulsifiers (for example
polyoxyethylene fatty alcohol ethers, alkylsulfonates and arylsulfonates) and
dispersants such as lignin-sulfite waste liquors and methylcellulose.

4Suitablesurfactants are alkali metal, alkaline earth metal and ammonium salts of
30 lignosulfonlc acid, naphthalenesulfonic acid, phenolsulfonic acid,
dlbutyinaphthalenesulfonic acid, alkylarylsulfonates, alkyl sulfates, alkylsullbnates, fatty
alcohol sulfates, fatty acids and sulfated fatty alcohol glycol ethers, furthermore
condensates of sulfonated naphthalene and naphthalene derivatives with
formaldehyde, condensates of naphthalene or of naphthalenesulfonic acid with phenol
35 and formaldehyde, polyoxyethylene octyiphenyl ether, ethoxylated Isooctyiphenol,
octylphenol, nonylphenol, alkyiphenyl polyglycol ethers, tributylphenyl polyglycol ether, trlstearylphenyl polyglycol ether, alkylaryl poiyether alcohols, alcohol and fatty alcohol/ethylene oxide condensates, ethoxylated castor oil, polyoxyethylene alkyl

WO 2006/128863 PCT/EP2006/062714

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ethers, ethoxylated polyoxypropylene, lauryl alcohol polyglycol ether acetal, sorbitol esters, lignin-sulfite waste liquors and methylcellulose.

Substances which are suitable for the preparation of directly sprayable solutions,
5 emulsions, pastes or oil dispersions are mineral oil fractions of medium to high boiling
point, such as kerosene or diesel oil, furthermore coal tar oils and oils of vegetable or animal origin, aliphatic, cyclic and aromatic hydrocarbons, for example toluene, xyiene, paraffin, tetrahydronaphthalene, alkylated naphthalenes or their derivatives, methanol, ethanol, propanol, butanol, cyclohexanol, cyclohexanone, isophorone, strongly polar
10 solvents, for example dimethyl sulfoxide, N-methylpyrrolldone and water.

Powders, materials for spreading and. dustable products can be prepared by mixing or
concomitantly grinding the active substances with a solid carrier.

15 Granules, for example coated granules, impregnated granules and homogeneous
granules, can be prepared by binding the active compounds to solid carriers. Examples

S of solid carriers are mineral earths such as silica gels, silicates, talc, kaolin, attaclay,

limestone, lime, chalk, bole, loess, clay, dolomite, diatomaceous earth, calcium sulfate,
magnesium sulfate, magnesium oxide, ground synthetic materials, fertilizers, such as,
20 for example, ammonium sulfate, ammonium phosphate, ammonium nitrate, ureas, and
products of vegetable origin, such as cereal meal, tree bark meal, wood meal and
nutshell meal, cellulose powders and other solid carriers.

In general, the formulations comprise from 0.01 to 95% by weight, preferably from 0.1
25 to 90% by weight, of the active compounds. The active compounds are employed in a
purity of from 90% to 100%, preferably 95% to 100% (according to NMR spectrum).

The following are examples of formulations: 1. Products for dilution with water

30 A) Soluble concentrates (SL LS)
10 parts by weight of the active compounds are dissolved in water or In a water-soluble solvent As an alternative, wetters or other auxiliaries are added. The active compound dissolves upon dilution with water.

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WO 2006/128863 PCTIEP2006/062714

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B) Dispersible concentrates (DC)
20 parts by welghtof the active compounds are dissolved In cyclohexanone with
addition of a dispersant, for example polyvinylpyrrolidone. Dilution with water gives a dispersion.

C) Emulsifiable concentrates (EC)
15 parts by weight of the active compounds are dissolved in xylene with addition of calcium dodecylbenzenesulfonate and castor oil ethoxylate (in each case 5% strength). Dilution with water gives an emulsion

0) Emulsions (EW, ED, ES)
40 parts by weight of the active compounds are dissolved in xylene with addition of calcium dodecylbenzeriesulfonate and castor oil ethoxylate (in each case 5% strength). This mixture is introduced Into water by means of an emulsifier (Ultraturax) and made
15 Into a homogeneous emulsion. Dilution with water gives an emulsion.

E) Suspensions (SC, OD, ES)
In an agitated ball mill, 20 parts by weight of the active compounds are comminuted
with addition of dispersant, wetters and water or an organic solvent to give a fine active
20 compound suspension. Dilution with water gives a stable suspension of the active
compound.

9- Waterdispersible-granilesand-watersokible-granti1es-(WG-SG)-
50 parts by weight of the active compounds are ground finely with addition of
25 dispersants and wetters and made into water-dispersible or water-soluble granules by
means of technical appliances (for example extrusion, spray tower, fluidized bed).
Dilution with water gives a stable dispersion or solution of the active compound.

G) Water-dispersible powders and water-soluble powders (WP, SP, WS)
30 75 parts by weight of the active compounds are ground in a rotor stator mill with
addition of dispersant, wetters and silica gel. Dilution with water gives a stable
dispersion or solution with the active compound.

2. Products to be applied undiluted
35

H) Dustable powders (DPI DS)
5 parts by weight of the active compounds are ground finely and mixed intimately with 95% of finely divided kaolin. This gives a dustable product

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W020061128863 PCTIP2006/062714

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I) Granules (GR, FG, GG, MG)
0.5 part by weight of the active compounds is ground finely and associated with 95.5% carriers. Current methods are extrusion, spray-drying or the fluidized bed. This gives granules to be applied undiluted.

J) ULV solutions (UL)
10 parts by weight of the active compounds are dissolved in an organic solvent, for example xylene. This gives a product to be applied undiluted.

10 The Inventive mixtures can be used as such, in the form of their formulations or the use
forms prepared therefrom, for example In the form of directly sprayable solutions,
powders, suspensions or dispersions, emulsions, oil dispersions, pastes, dustable products, materials for spreading, or granules, by means of spraying, atomizing,
dusting, spreading or pouring. The use forms depend entirely on the intended
15 purposes; It Is Intended to ensure in each case the finest possible distribution of the
active compounds according to the invention.

Aqueous use forms can be prepared from emulsion concentrates, pastes or wettable powders (sprayable powders, oil dispersions) by adding water. To prepare emulsions,
20 pastes or oil dispersions, the substances, as such or dissolved In an oil or solvent, can
be homogenized In water by means of a wetter, tackifier, dispersant or emulsifier. Alternatively, it is possible to prepare concentrates composed of active substance,
wetter, tackifler, dispersant or emulsifier and, If appropriate, solvent or oil, and such concentrates are suitable for dilution with water.
25

The active compound concentrations in the ready-to-use preparations can be varied within relatively wide ranges. In general, they are from 0,0001 to 10%, preferably from 0,01 to 1%.

30 The inventive mixtures may also be used successfully in the ultra-low-volume process
(ULV), it being possible to apply formulations comprising over 95% by weight of active

S compound, or even to apply the active compound without additives.

Compositions of this Invention may also contain other active ingredients, for example
other pesticides, Insecticides, herbicides, fertilizers such as ammonium nitrate, urea,
35 potash, and superphosphate, phytotoxlcants and plant growth regulators, safeners and
nematicides. These additional ingredients may be used sequentially or in combination
with the above-described compositions, if appropriate also added only immediately
prior to use (tank mix). These agents can be admixed with the mixtures according to

WO 2006/128863 PCTP2006/062714

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the Invention in a weight ratio of 1:10Ao 10:1. For example, the plant(s) may be
sprayed with a composition of this invention either before or after being treated with
other active ingredients.

5 The mixtures and methods according to the invention are particularly useful for the con-
trol of pests. The inventive mixtures are suitable for efficiently controlling insects and
arachnids. They can be applied to any and all developmental stages, such as egg,
larva, pupa, and adult

10 The pests may be controlled by contacting the target pest, its food supply, habitat,
breeding ground or its locus with a pesticidally effective amount of the inventive mix-
tures or of compositions comprising the mixtures.

"Locus" means a plant, seed, soil, area, material or environment in which a pest is gro- JI 15 wing or may grow.
In general, "pesticidally effective amount" means the amount of the inventive mixtures
. or of compositions comprising the mixtures needed to achieve an observable effect on
growth, including the effects of necrosis, death, retardation, prevention, and removal,
20 destruction, or otherwise diminishing the occurrence and activity of the target organism.
The pesticidally effective amount can vary for the various mixtures / compositions used
in the invention. A pesticidally effective amount of the mixtures I compositions will also
vary according to the prevailing conditions such as desired pesticidal effect and dura-
tion, weather, target species, locus, mode of application, and the like.
25

The inventive mixtures or compositions of these mixtures can also be employed for protecting plants from attack or infestation by Insects or arachnids comprising
contacting a plant, or soil or water in which the plant is growing.

30 In the context of the present invention, the term plant refers to an entire plant, a part of
the plant or the propagation material of the plant, that Is, the seed or the seedling.

Some of the inventive mixtures have systemic action and can therefore be used for the protection of the plant shoot against foliar pests as well as for the protection of the seed
35 and roots against soil pests.

The compounds I and the compound II can be applied simultaneously, that is jointly or separately, or in succession, the sequence, in the case of separate application, gener-
ally not having any effect on the result of the control measures.
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WO 2006/128863 PCT/EP20061062714 5rf
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The compounds I and the compound II are usually applied in a weight ratio of from
100:1 to 1:100, preferably from 20:1 to 1:50, in particular from 5:1 to 1:20.
Depending on the desired effect, the application rates of the mixtures according to the
invention are from 5 glha to 2000 glha, preferably from 50 to 1500 glha, in particular
5 from 50 to 750 glha.

The inventive mixtures are also suitable for the.protection of the seed and the seed-
lings’ roots and shoots, preferably the seeds, against soil pests.

10 Conventional seed treatment formulations include for example flowable concentrates
ES, solutions LS, powders for dry treatment DS, water dispersible powders WS or
granules for slurry treatment, water soluble powders SS and emulsion ES. Application
to the seeds is carried out before sowing, either directly on the seeds or after having
, pregerminatedthe latter. Preferred are FS formulations.
15

In the treatment of seed, the application rates of the mixture are generally from 0,1 to
10 kg per 100 kg of seed. The separate orjoint application of the compounds I and II or
. of the mixtures of the compounds I and II is carried out by spraying or dusting the
seeds, the seedlings, the plants or the soils before or after sowing of the plants or be-
20 fore or after emergence of the plants.

The invention also relates to the propagation products of plants, and especially the
seed comprising, that is, coated with and/or containing, a mixture as defined above or a
composition containing the mixture of two active Ingredients or a mixture of two corn-
25 positions each providing one of the two active ingredients. The seed comprises the
Inventive mixtures In an amount of from 0,1 g to 10 kg per 100 kg of seed.

The Inventive mixtures are effective through both contact (via soil, glass, wall, bed net, carpet, plant parts or animal parts), and ingestion (bait, or plant part) and through
30 trophallaxls and transfer.

Preferred application methods are into water bodies, via soil, cracks and crevices, pastures, manure piles, sewers, into water, on floor, wall, or by perimeter spray application and bait.
35

According to a preferred embodiment of the invention, the Inventive mixtures are em-ployed via soil application. Soil application is especially favorable for use against ants, termites, flies, crickets, or cockroaches.

WO 2006/128863 PCTIEP2006/062714

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According to another preferred embodiment of the invention, for use against non crop pests such as ants, termites, wasps, files, mosquitoes, crickets, locusts, or cock-roaches the inventive mixtures are prepared into a bait preparation.

5 The bait can be a liquid, a solidor a semisolid preparation (e.g. a gel). The bait em-
ployed In the composition is a product which is sufficiently attractive to incite insects
such as ants, termites, wasps, flies, mosquitoes, crickets etc. or cockroaches to eat it.
This attractant may be chosen from feeding stimulants or para and I or sex phero-
mones. Suitable feeding stimulants are chosen, for example, from animal and/or plant
10 proteins (meat-, fish- or blood meal, insect parts, crickets powder, egg yolk), from fats
and oils of animal and/or plant origin, or mono-, oligo- or polyorganosaccharides, espe-cially from sucrose, lactose, fructose, dextrose, glucose, starch, pectin or even molas-
ses or honey, or from salts such as ammonium sulfate, ammonium carbonate or am-monium acetate. Fresh or decaying parts of fruits, crops, plants, animals, insects or
15 specific parts thereof can also serve as a feeding stimulant Pheromones are known to
be more insect specific. Specific pheromones are described In the literature and are
known to those skilled in the art.

Methods to control infectious diseases transmitted by insects (e.g. malaria, dengue and
20 yellow fever, lymphatic filariasis, and leishmaniasis) with the inventive mixture and its
respective compositions also comprise treating surfaces of huts and houses, air spray-
ing and impregnation of curtains, tents, clothing items, bed nets, tsetse-fly trap or the
like. Insecticidal compositions for application to fibers, fabric, knitgoods, nonwovens,
netting material or foils and tarpaulins preferably comprise a mixture including the in-
25 secticide, optionally a repellent and at least one binder.

The impregnation of curtains and bednets is mostly done by dipping the textile material
into emulsions or dispersions of the Insecticide or spraying them onto the nets.

4 30 The Inventive mixtures and the compositions comprising them can be used for protect-

ing wooden materials such as trees, board fences, sleepers, etc. and buildings such as
houses, outhouses, factories, but also construction materials, furniture, leathers, fibers,
vinyl articles, electric wires and cables etc. from ants and/or termites, and for control-
ling ants and termites from doing harm to crops or human being (e.g. when the pests
35 invade Into houses and public facilities). The inventive mixtures are applied not only to
the surrounding soil surface or into the under-floor soil in order to protect wooden mate-rials but It can also be applied to lumbered articles such as surfaces of the under-floor concrete, alcove posts, beams, plywoods, furniture, etc., wooden articles such as parti-
cle boards, half boards, etc. and vinyl articles such as coated electric wires, vinyl
40 sheets, heat Insulating material such as styrene foams, etc. In case of application

WO 2006/128863 PCTIEP2006/062714

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against ants doing harm to crops or human beings, the ant control composition of the present invention is directly applied to the nest of the ants or to its surrounding or via
bait contact. The mixtures or compositions of the invention can also be applied preven-tively to places at which occurrence of the pests is expected.

In the case of soil treatment or of application to the pests dwelling place or nest, the quantity of active Ingredients ranges from 0.0001 to 500 g per 100 m2, preferably from 0.001 to 20 g per 100 m2.

10 Customary application rates in the protection of materials are, for example, from 0.01 g
to 1000 g of active compound per M2treated material, desirably from 0.1 g to 50 g per
M2.

Insecticidal compositions for use in the impregnation of materials typically contain from
15 0.001 to 95 weight %, preferably from 0.1 to 45 weight %, and more preferably from 1
to 25 weight % of at least one repellent and / or inventive mixture.

For use in bait compositions, the typical content of the inventive mixture is from 0.0001 weight % to 15 weight %, desirably from 0.001 weight % to 5% weight %. The compost-
20 bon used may also comprise other additives such as a solvent of the active material, a
flavoring agent, a preserving agent, a dye or a bitter agent Its attractiveness may also
be enhanced by a special color, shape or texture.

For use in spray compositions, the content of the inventive mixture is from 0.001 to 80
25 weights %, preferably from 0.01 to 50 weight % and most preferably from 0.01 to 15
weight%.

For use in treating crop plants, the rate of application of the inventive mixture may be in
the range of 0.1 g to 4000 g per hectare, desirably from 25 g to 600 g per hectare,
30 more desirably from 50 g to 500 g per hectare.

It was also an object of the present invention to provide mixtures suitable for treating,
controlling, preventing and protecting warm-blooded animals, including humans, and
. fish against Infestation and infection by pests. Problems that may be encountered with
35 pest control on or in animals and/or humans are similar to those described at the out-
set, namely the need for reduced dosage rates, and / or enhanced spectrum of activity
and/or combination of knock-down activity with prolonged control and / or resistance
management

WO 2006/128863 PCTIEP2006/062714

22

This invention also provides a method for treating, controlling, preventing and protect-
ing warm-blooded animals, including humans, and fish against infestation and infection by pests of the orders Siphonaptera, Hymenoptera, Hemiptera, Orthoptera, Acarina, Phthiraptera, and Diptera, which comprises orally, topically or parenterally administer-
5 ing or applying to said animals a pesticidally effective amount of mixtures according to
the invention.

The invention also provides a process for the preparation of a composition for treating, controlling, preventing or protecting a warm-blooded animal or a fish against Infestation
10 or infection by pests of the Siphonaptera, Hymenoptera, Hemiptera, Orthoptera,
Acarina, Phthiraptera, and Diptera orders which comprises a pesticidally effective
amount of a mixture according to the invention.

The above method is particularly useful for controlling and preventing infestations and
15 infections in warm-blooded animals such as cattle, sheep, swine, camels, deer, horses,
poultry, goats, dogs and cats as well as humans.

Infestations in warm-blooded animals and fish including, but not limited to, lice, biting
Is lice, ticks, nasal bots, keds, biting flies, muscoid flies, files, mylasitic fly larvae, chig-
20 gers, gnats, mosquitoes and fleas may be controlled, prevented or eliminated by the
mixtures according to the invention.

The inventive mixtures and compositions comprising them are especially suitable for
efficiently combating the following pests:

fleas (Sihonaptera), e.g. Ctenocepha/Idea fells, C. can/s. Xenopsy/Ia cheopis, Pu/ex
11t/tans, Tunga penetrans, and Nosopsy//us fasciatus;

ants, wasps, sawflies (Hymenoptera), e.g. Ama//a rosae, A/ta cephalofes, A/ta
’ 30 sexdens, A/ta texana, Crematogasterspp., Hoplocampa minuta, Hop/ocampa testudi-
naB, Monomor/um pharaon/s, Solenopsis geminata, So/enopsis mv/c/a, S. r/chten S.
xyloni, Pogonomyrmex barbatus, Pogonomyrmex californ/cus, Dasy,nut/lla occidentalls,
Bombus SPp. Vespu/a squamosa, Paravespula vu/garis, P. pennsylvanica, P. ger-
man/ca, Dol/chovespula maculata, Vespa crabro, Pofistes rubi’/nosa, Camponotus
35 florldanus, and L/nepitheum lium/le,

crickets, grasshoppers, locusts (Orthoptera), e.g. Ache/a domes//ca, Foificula aur/cu-
lana, Gryl/otalpa gryl/ota/paLocusta miqratoria, Melanoplus bivittatus, Melanoplus fe-mur-rubrum, Melanoplus mexicanus, Melanoplus sangu/n4c’es, Melanoplus spretus,

WO 2006/128863 PCTIEP2006/062714

23

Nomadacris septemfasciata, Schistocerca americana, Schistocerca peregrina, Stauronotus maroacanus and Tac/iycines asynamorus.

Acarina, e.g. ticks (Ixodida), e.g. Phipicephalus sangulneus, or mites, such as
5 Mesostigmata, e.g. Omithonyssus bacoti and Dermanyssus gallinae, Prostiqmata, e.g.
Pymotes tnWc orAstiqmata, e.g. Acarus s/rn;

lice (Phthlraptera), e.g. Ped/cu/us humanus capitis, Pedicu/us humanus corporis, Pythi-rus pubis, Haematopinus eurysternus, Haematop/nus suis, Linognathus v/tuliarid So-
10 /enopotes capillatus;

flies, mosquitoes (Diotera), e.g. Aedes aegypti Aedes aibopictus, Aedes vexans, An-astrepha ludens, Anopheles macul4oennis, Anopheles cruc/nas, An. albinianus, An. Gambiae, An. freeborn,; An. /eucosp/iyrus, An. minimus, An. quad/in7aculatus, Cal-
15 lihora v/c/na, Cerat/tis cap/fats, Chrysomya bezziana, Chrysomya hominivorax, Chry-
somya macel/aria, Chrysomya bezziana, Chrysops discs/is, C. s/laces, C. atlant/cus, Cochiomyla /iom/riivorax, Contar/nia sorghicola, cordy/obia ant/iropophaga, Cu/lao/des furens, CulexpØiens, Cu/ex nirioa/pus, C. quinquefasciatus, C. tarsal/s. Cuilseta)or-nate, C. melanura, Dacus cucurb/tae, Dacus oleae, Dasineura brassicae, Dermatobia
20 horn/n/s1 Fannia can/cu/ar/s, Gasteroplil/us infest/nails, Gloss/na mars/tans, Gloss/na
pa/pails, G. fusc,oes, G. tach/noides, Haematobia i17/tans, Hap/odi;o/os/s equestris, Hio-palates spp., Hy/emyia platura, Hypodernia ilneata, Leptoconops toirens, L/rioma Łat/vae,Liriomyza frffo/,Z Lucille caprina, Lucilla cupr/na, Lucille sericata, Lycoria pec-toral/s. Mansonia titillanus, Mayet/o/a destizictor, Musca domestics, Muscina stabulans,.
25 Oestrus avis, Oscinella fr/f, Pegomya hysocyam/, Phorbia ant/qua, Phorbia brassicae,
Phorbia coarctata, Phlebotomus argent4es, Psorophora colurnb/ae, P. discolor,
Pros/mull/rn mixtum, Rhago/et/s ceras, Rhago/etis pomone//a, Sarcophaga haemor-rhoidalls, Sarcophaga sp., S/mull/rn vittatum, Stornoxys ca/c/trans. Tabanus bovinus,
Tabanus atratus, T lineola, T. s/mills, Tipula oleracea, and Tipu/apaludosa
30 true bugs (Hem49tera), e.g. Acrosternum h//are, Bilssus leucopterus, Cyiiope/tis no-
tatus, Dysdercus cingulatus, Dysdercus intermedius, Eurygaster/ntegr/ceps, Euschis-
(us Impictiventris, Leptog/ossusphyllopus, Lygus ilneolar/s, Lyguspratensis, Nezara
vir/dula, P/esma quadrata, Solubea insular/s, Thyanta perd/tor, Acyrthosihon ono-

0 brychis, Ade/ges lands, Aphidu/a nastuntii Aphis fabee, Aphis forbesi, Aphis porn,;
35 Aphis gossyph Aphis grossular/ae, Aphis schneideni Aphis sp/raeco/a, Aphis sambuc
Acyrthosiphon p/sum, Aulacorthum so/an!; Brachycaudus cardu, Brachycaudus
hellchrysi; Brachycaudus persicae, Brachycaudus prun/cola, Brev/coryne brassicae,
Cap/tophorus horn,; Cerosioha gossypil, Chaetoslphon fragaefolii Cryptomyzus rib/s.
Dreyfusia nordmann/anae, Dreyfusla p/ceae, Dysaph/s red/cola; Dysaulacorthurn
40 pseudosolan/, Dysaphis plantagmnea, Dysaph/s pyrl, Enipoasca fabae, Hyalopterus

WO 20061128863 PCT1EP20061062714

24

pruni Hyperomyzus Iactucae, Macrosiohum avenae, Macrosihum euphorbise, Mac-rosihon rosae, Megoura viciae, Melanaphis pyrarius, Metopoloph/um dirhodum, My-zodes persicae, Myzus asca/onicus, Myzus ceras4 Myzus varians, Nasonovia,ib/s-n/g4 Nilaparvata lugens, Pemphigus bursar/us, Perkins/ella saccharicida, Phorodon
5 humuli, Psylla ma/i; Psj4la pirl Rhopalomyzus asca/onicus, Rhopalosiohum maid/s,
Rhopalosiohum padi, Rhopa/osiohum insertum, Sappaphis ma/a, Sappaphis mall, Schizaphis graminum, Schizoneura /anug/nosa, Sitobion avenae, Tr/a/eumdes vapo-rariorum, Toxoptera auranti/and, V/teus v/thai/i, Cimex lectu/arius, C. hemioterus, Re-duvius senilis, Triatonia spp., and Arilus critatus.
10

For oral administration to warm-blooded animals, the mixtures according to the inven-
tion may be formulated as animal feeds, animal feed premixes, animal feed concen-trates, pills, solutions, pastes, suspensions, drenches, gels, tablets, boluses and cap-sules. In addition, the mixtures according to the invention may be administered to the
15 animals in their drinking water. For oral administration, the dosage form chosen should
provide the animal with 0.01 mg/kg to 100 mg/kg of animal body weight per day of the mixture.

Alternatively, the mixtures according to the invention may be administered to animals
20 parenterally, for example, by intraruminal, intramuscular, intravenous or subcutaneous
injection. The mixtures according to the Invention may be dispersed or dissolved ma physiologically acceptable carrier for subcutaneous injection. Alternatively, the mixtures according to the invention may be formulated Into an implant for subcutaneous admini-stration. In addition the mixtures according to the Invention may be transdermally ad-
25 ministered to animals. For parenteral administration, the dosage form chosen should
provide the animal with 0,01 mg/kg to 100 mg/kg of animal body weight per day of the mixture.

The mixtures according to the invention may also be applied topically to the animals in
30 the form of dips, dusts, powders, collars, medallions, sprays, spot-on and pour-on for-
mulations. For topical application, dips and sprays usually contain 0,5 ppm to 5,000
ppm and preferably 1 ppm to 3,000 ppm of the inventive compounds. In addition, the mixtures according to the invention may be formulated as ear tags for animals, particu-larly quadrupeds such as cattle and sheep.
35

The pesticidal action of the compounds and the mixtures can be demonstrated by the experiments below:

Potato plants for Colorado potato beetle and two-leaf cotton plants for tobacco bud-
40 worm were utilized for bioassays. Excised plant leaves were dipped into 1:1 ace-

WO 2006/128863 PCTIEP2006/062714

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Table 2. Activity of mixtures of compound 1-2 with alpha-cypermethrin, metaflumizone or Imidacloprid

Active Dose rate
ppm]

Mortality of
Colorado Potato Beetle

Mortality of
Tobacco Budworm
1-2 100 12.5
60 39.6 5.4
30 6.3
alpha-

cypermethrin 0.06 4.2 8.9
0.03 0 0
1-2 alpha-
cypermethrlri

mortality
observed

mortality
expected

%moiiallty
observed

%moiia/ity
expected
100+0.06 75.0 20.3
100+0.03 60.7 12.5
60+0.06 79.2 42.1 42.9 13.8
60+0.03 70.8 39.6 17.9 5.4
30+0.06 45.8 10.2
30+0.03 45.8 j 6.3

metaflumlzone 0.3 78.6
0.1 1.8
1-2 mete-
flumizone

mortality
observed

mortality
expected

Yomortallty
observed

%mortalfty
expected
100+0.3 100 81.3
100+0.1 67.9 14.1
100 79.8
60+0.1 64.3 7.1

Imidacloprid 0.06 0
I-I imidaclo-
prid

mortality
observed

mortality
expected

%mortallty
observed

%mortality
expected
60 0.06 83.3 39.6
3040.06 41.7 6.3