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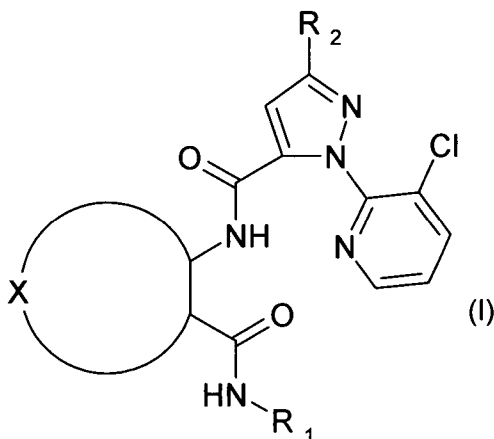
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(54) Title: PESTICIDAL FORMULATION



(57) Abstract: The present invention relates to novel insecticidal active compositions comprising an insecticidally active bisamide derivative of formula (I) wherein the substituents are defined in claim 1, and b) at least one adjuvant component selected from b1) an oil additive comprising an oil of vegetable or animal origin, a mineral oil, the alkylesters thereof or mixtures of these oils and oil derivatives; b2) an adjuvant having the formula (II) $R_6 - (CO)_m - O - [-R_7O-]_n - R_8$ wherein R_6 is a C_{16} to C_{20} straight or branched chain alkyl or alkenyl group, R_7 is ethyl or isopropyl, n is from 8 to 30 and m is 0 or 1 and when R_7 is ethyl, R_8 is a C_1 to C_7 alkyl group and when R_7 is isopropyl, R_8 is hydrogen or a C_1 to C_7 alkyl group; and b3) one or more completely esterified organic phosphates and/or phosphonates, or mixtures of said adjuvant components.

Pesticidal Formulation

The present invention relates to novel insecticidal active compositions, in particular to insecticidal active composition comprising a bisamide derivative, and an adjuvant component and to their use for controlling insects or representatives of the order Acarina.

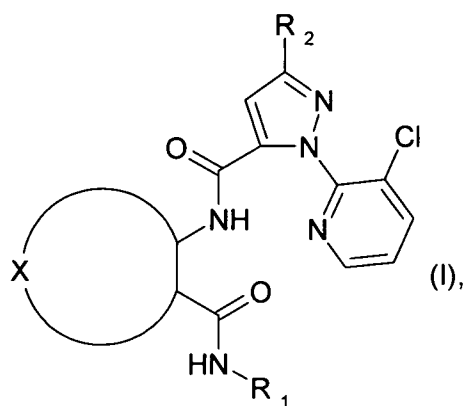
Numerous formulation types are used in the agrochemical industry. The choice of formulation type depends on various factors, including the physical properties of the active ingredient itself. Oil dispersions are particularly useful for formulations containing oil insoluble active ingredients. It is further known from US-A-4,834,908 that certain crop oil concentrates are useful to increase the herbicidal activity of diverse chemical classes and assist in defeating the apparent antagonism which arises in herbicidal mixtures. WO 2007/081553 describes suspension concentrate compositions of carboxamide arthropodicides which can contain water-immiscible carrier selected from a fatty acid ester of a C₁-C₄alkanol, a vegetable oil and a mineral oil. Liquid formulations and tensid/solvent systems which comprise completely esterified organic phosphates and/or phosphonates as solvents are described in EP1164842B1.

Bisamide derivatives with insecticidal activity are known and described, for example, in WO 04/067528, WO 2005/085234, WO 2006/111341, WO07/020050, WO06/040113, and WO 2007/093402.

Surprisingly, it has now been found that certain classes of adjuvants are very useful to significantly increase the insecticidal action of a specific class of bisamide derivatives.

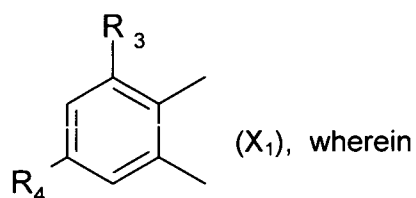
The object of the present invention is thus a pesticidal composition comprising
a) a compound of formula I

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wherein

X is a bivalent group



R₁ is C₃-C₆cycloalkyl substituted by C₃-C₆cycloalkyl;

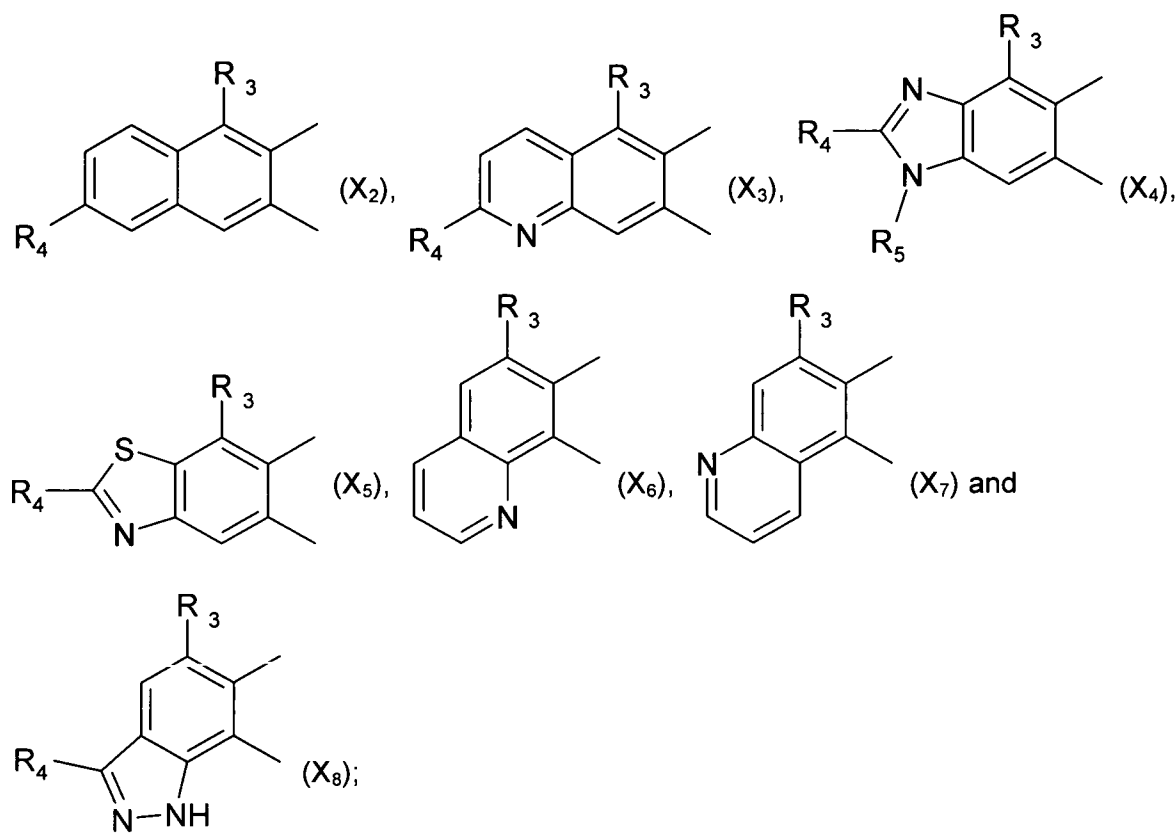
R₂ is halogen, C₁-C₄alkoxy, C₁-C₄haloalkyl or C₁-C₄haloalkoxy;

R₃ is C₁-C₄alkyl or halogen; and

R₄ is hydrogen, C₁-C₄alkyl, C₁-C₄alkoxy, cyano, nitro, or halogen;

or X is a bivalent group selected from

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wherein R₁ is hydrogen, C₁-C₄alkyl or C₁-C₄alkyl substituted with one or two groups selected from C₃-C₆cycloalkyl and cyano; or R₁ is C₃-C₆cycloalkyl or C₃-C₆cycloalkyl substituted by C₃-C₆cycloalkyl;

R₂ is halogen, C₁-C₄alkoxy, C₁-C₄haloalkyl or C₁-C₄haloalkoxy;

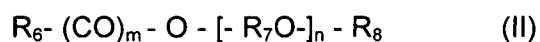
R₃ is C₁-C₄alkyl or halogen; and

R₄ and R₅ independently from each other, are hydrogen, C₁-C₄alkyl, C₁-C₄alkoxy, cyano, nitro, or halogen; and agronomically acceptable salts/isomers/enantiomers/tautomers/N-oxides of those compounds and

b) at least one adjuvant component selected from

b1) an oil additive comprising an oil of vegetable or animal origin, a mineral oil, the alkylesters thereof or mixtures of these oils and oil derivatives;

b2) an adjuvant having the formula (II)



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wherein R_6 is a C_{16} to C_{20} straight or branched chain alkyl or alkenyl group, R_7 is ethyl or isopropyl, n is from 8 to 30 and m is 0 or 1 and when R_7 is ethyl, R_8 is a C_1 to C_7 alkyl group and when R_7 is isopropyl, R_8 is hydrogen or a C_1 to C_7 alkyl group; and

b3) one or more completely esterified organic phosphates and/or phosphonates, or mixtures of said adjuvant components.

The compounds of formula I which have at least one basic centre can form, for example, acid addition salts, for example with strong inorganic acids such as mineral acids, for example perchloric acid, sulfuric acid, nitric acid, nitroic acid, a phosphorus acid or a hydrohalic acid, with strong organic carboxylic acids, such as C_1 - C_4 alkanecarboxylic acids which are unsubstituted or substituted, for example by halogen, for example acetic acid, such as saturated or unsaturated dicarboxylic acids, for example oxalic acid, malonic acid, succinic acid, maleic acid, fumaric acid or phthalic acid, such as hydroxycarboxylic acids, for example ascorbic acid, lactic acid, malic acid, tartaric acid or citric acid, or such as benzoic acid, or with organic sulfonic acids, such as C_1 - C_4 alkane- or arylsulfonic acids which are unsubstituted or substituted, for example by halogen, for example methane- or p-toluenesulfonic acid. Compounds of formula I which have at least one acidic group can form, for example, salts with bases, for example mineral salts such as alkali metal or alkaline earth metal salts, for example sodium, potassium or magnesium salts, or salts with ammonia or an organic amine, such as morpholine, piperidine, pyrrolidine, a mono-, di- or tri-lower-alkylamine, for example ethyl-, diethyl-, triethyl- or dimethylpropylamine, or a mono-, di- or trihydroxy-lower-alkylamine, for example mono-, di- or triethanolamine. Where appropriate, the corresponding internal salts can furthermore be formed.

The alkyl groups occurring in the definitions of the substituents can be straight-chain or branched and are, for example, methyl, ethyl, n-propyl, isopropyl, n-butyl, sec-butyl, iso-butyl or tert-butyl.

Halogen is generally fluorine, chlorine, bromine or iodine.

Haloalkyl groups preferably have a chain length of from 1 to 6 carbon atoms. Haloalkyl is, for example, fluoromethyl, difluoromethyl, trifluoromethyl, chloromethyl, dichloromethyl, trichloromethyl, 2,2,2-trifluoroethyl, 2-fluoroethyl, 2-chloroethyl, pentafluoroethyl, 1,1-difluoro-

2,2,2-trichloroethyl, 2,2,3,3-tetrafluoroethyl and 2,2,2-trichloroethyl; preferably trichloromethyl, difluorochloromethyl, difluoromethyl, trifluoromethyl and dichlorofluoromethyl.

Haloalkoxy groups preferably have a chain length of from 1 to 6 carbon atoms. Haloalkoxy is, for example, fluoromethoxy, difluoromethoxy, trifluoromethoxy, chloromethoxy, 2,2,2-trifluoroethoxy, 2-fluoroethoxy, 2,2-difluoroethoxy, 2-chloroethoxy, pentafluoroethoxy, 2,2,3,3-tetrafluoroethoxy and 2,2,2-trichloroethoxy; preferably difluorochloromethoxy, difluoromethoxy, trifluoromethoxy, 2-fluoroethoxy, 2,2-difluoroethoxy and 2,2,2-trifluoroethoxy.

Alkoxy groups preferably have a preferred chain length of from 1 to 6 carbon atoms. Alkoxy is, for example, methoxy, ethoxy, propoxy, i-propoxy, n-butoxy, isobutoxy, sec-butoxy and tert-butoxy; preferably methoxy and ethoxy.

The cycloalkyl groups have from 3 to 6 ring carbon atoms, for example cyclopropyl, cyclobutyl, cyclopentyl and cyclohexyl.

The compounds of formula I, wherein X is X₁, X₂, X₃ or X₈ are preferred. The compounds of formula I, wherein X is X₈ are especially preferred for the use in the compositions according to the present invention.

Especially suitable compounds for the use in the compositions according to the present invention are selected from the compounds of formula I described in Table 1:

Table 1: preferred compounds of formula I:

Compound No.	Substituent Designations of formula I
1.1	R ₁ is cyclopropyl substituted by cyclopropyl at the 1-position, R ₂ is bromine, R ₃ is methyl, R ₄ is CN and X is X ₁ ;
1.2	R ₁ is cyclopropyl substituted by cyclopropyl at the 1-position, R ₂ is CF ₃ , R ₃ is methyl, R ₄ is Cl and X is X ₁ ;
1.3	R ₁ is cyclopropyl substituted by cyclopropyl at the 1-position, R ₂ is CF ₃ , R ₃ is methyl, R ₄ is CN and X is X ₁ ;
1.4	R ₁ is cyclopropyl substituted by cyclopropyl at the 1-position, R ₂ is

Compound No.	Substituent Designations of formula I
	OCH ₂ CF ₃ , R ₃ is methyl, R ₄ is CN and X is X ₁ ;
1.5	R ₁ is methyl, R ₂ is CF ₃ , R ₃ is chlorine, R ₄ is chlorine and X is X ₂ ;
1.6	R ₁ is isopropyl, R ₂ is CF ₃ , R ₃ is chlorine, R ₄ is chlorine and X is X ₂ ;
1.7	R ₁ is methyl, R ₂ is bromine, R ₃ is chlorine, R ₄ is chlorine and X is X ₂ ;
1.8	R ₁ is methyl, R ₂ is CF ₃ , R ₃ is methyl, R ₄ is chlorine and X is X ₂ ;
1.9	R ₁ is isopropyl, R ₂ is CF ₃ , R ₃ is methyl, R ₄ is chlorine and X is X ₂ ;
1.10	R ₁ is methyl, R ₂ is bromine, R ₃ is methyl, R ₄ is chlorine and X is X ₂ ;
1.11	R ₁ is methyl, R ₂ is CF ₃ , R ₃ is methyl, R ₄ is methyl and X is X ₃ ;
1.12	R ₁ is isopropyl, R ₂ is CF ₃ , R ₃ is chlorine, R ₄ is hydrogen and X is X ₈ ;
1.13	R ₁ is methyl, R ₂ is CF ₃ , R ₃ is chlorine, R ₄ is hydrogen and X is X ₈ ;
1.14	R ₁ is isopropyl, R ₂ is methoxy; R ₃ is methyl, R ₄ is hydrogen and X is X ₈ ;
1.15	R ₁ is methyl, R ₂ is methoxy; R ₃ is methyl, R ₄ is hydrogen and X is X ₈ ;
1.16	R ₁ is isopropyl, R ₂ is CF ₃ , R ₃ is methyl, R ₄ is hydrogen and X is X ₈ ;
1.17	R ₁ is isopropyl, R ₂ is Br, R ₃ is methyl, R ₄ is hydrogen and X is X ₈ ;
1.18	R ₁ is isopropyl, R ₂ is Br, R ₃ is chlorine, R ₄ is hydrogen and X is X ₈
1.19	R ₁ is isopropyl, R ₂ is methoxy, R ₃ is chlorine, R ₄ is hydrogen and X is X ₈ ;

The compounds of formula I can be prepared analogously to known processes, for example as described, for example, in WO 2005/085234, WO 2006/111341, WO 2007/020050 , WO2006/040113, and WO2007/093402.

The preparation of the compounds of formula II is described in EP 1427280A0.

Salts of compounds of formula I can be prepared in a manner known per se. Thus, for example, acid addition salts of compounds of formula I are obtained by treatment with a suitable acid or a suitable ion exchanger reagent and salts with bases are obtained by treatment with a suitable base or with a suitable ion exchanger reagent.

Salts of compounds of formula I can be converted in the customary manner into the free compounds of formula I, acid addition salts, for example, by treatment with a suitable basic

compound or with a suitable ion exchanger reagent and salts with bases, for example, by treatment with a suitable acid or with a suitable ion exchanger reagent.

Salts of compounds of formula I can be converted in a manner known per se into other salts of compounds of formula I, acid addition salts, for example, into other acid addition salts, for example by treatment of a salt of inorganic acid such as hydrochloride with a suitable metal salt such as a sodium, barium or silver salt, of an acid, for example with silver acetate, in a suitable solvent in which an inorganic salt which forms, for example silver chloride, is insoluble and thus precipitates from the reaction mixture.

Depending on the procedure or the reaction conditions, the compounds of formula I, which have salt-forming properties can be obtained in free form or in the form of salts.

The compounds of formula I and, where appropriate, the tautomers thereof, in each case in free form or in salt form, can be present in the form of one of the isomers which are possible or as a mixture of these, for example in the form of pure isomers, such as antipodes and/or diastereomers, or as isomer mixtures, such as enantiomer mixtures, for example racemates, diastereomer mixtures or racemate mixtures, depending on the number, absolute and relative configuration of asymmetric carbon atoms which occur in the molecule and/or depending on the configuration of non-aromatic double bonds which occur in the molecule; the invention relates to the pure isomers and also to all isomer mixtures which are possible and is to be understood in each case in this sense hereinabove and hereinbelow, even when stereochemical details are not mentioned specifically in each case.

Diastereomer mixtures or racemate mixtures of compounds of formula I, in free form or in salt form, which can be obtained depending on which starting materials and procedures have been chosen can be separated in a known manner into the pure diastereomers or racemates on the basis of the physicochemical differences of the components, for example by fractional crystallization, distillation and/or chromatography.

Enantiomer mixtures, such as racemates, which can be obtained in a similar manner can be resolved into the optical antipodes by known methods, for example by recrystallization from an optically active solvent, by chromatography on chiral adsorbents, for example high-performance liquid chromatography (HPLC) on acetyl cellulose, with the aid of suitable mi-

croorganisms, by cleavage with specific, immobilized enzymes, via the formation of inclusion compounds, for example using chiral crown ethers, where only one enantiomer is complexed, or by conversion into diastereomeric salts, for example by reacting a basic end-product racemate with an optically active acid, such as a carboxylic acid, for example camphor, tartaric or malic acid, or sulfonic acid, for example camphorsulfonic acid, and separating the diastereomer mixture which can be obtained in this manner, for example by fractional crystallization based on their differing solubilities, to give the diastereomers, from which the desired enantiomer can be set free by the action of suitable agents, for example basic agents.

Pure diastereomers or enantiomers can be obtained not only by separating suitable isomer mixtures, but also by generally known methods of diastereoselective or enantioselective synthesis, for example by carrying out the process according to the invention with starting materials of a suitable stereochemistry.

It is advantageous to isolate or synthesize in each case the biologically more effective isomer, for example enantiomer or diastereomer, or isomer mixture, for example enantiomer mixture or diastereomer mixture, if the individual components have a different biological activity.

The compounds of formula I and, where appropriate, the tautomers thereof, in each case in free form or in salt form, can, if appropriate, also be obtained in the form of hydrates and/or include other solvents, for example those which may have been used for the crystallization of compounds which are present in solid form.

Preferred adjuvant components b) are adjuvants known as penetrations enhancers and/or spreaders and wetters and combinations thereof. Penetration enhancers are adjuvants which increase the amount of a pesticide that is taken up in the plant and/or decreases the time span for the agrochemical to be taken up. Spreading and wetting adjuvants are additives which increase the sprayed area by increasing the spread for the spray droplet on the leaves.

Preferred adjuvant components b) are adjuvant components b1) which are oil based and contain mineral oils also known as liquid petrolatum, paraffin oil, paraffinic oil, comprise a mixture of long-chain, liquid hydrocarbons obtained from petroleum, or oils of vegetable

origin, for example rapeseed oil, olive oil or sunflower oil, alkyl esters of oils of vegetable origin, for example the methyl derivatives like methylated rape seed oil, or an oil of animal origin, such as fish oil or beef tallow and mixtures thereof.

Further preferred adjuvant components b1) contain alkylesters or alkylethers of higher fatty acids and alcohols (C_8 - C_{22}), especially the methyl and ethyl derivatives of C_{12} - C_{18} fatty acids, for example the methylesters of lauric acid, palmitic acid and oleic acid. These esters are known as methyl laurate (CAS-111-82-0), methyl palmitate (CAS-112-39-0) and methyl oleate (CAS-112-62-9). The hydrocarbon chain can be branched or unbranched, saturated or unsaturated or OH substituted. These alkylated esters and ethers can also include polyethoxylated or polypropoxylated esters and a mixture thereof. Particularly preferred polyethoxylated fatty alcohols contain 8 – 20 ethoxylates, for example oleic acid ethoxylate with EO up to 20. (Genopol® O100, Genopol® O120)

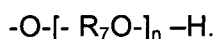
Further preferred adjuvant components b) contain sorbitan fatty esters and ethoxylated sorbitan fatty esters. (particularly Tween® 80 and Tween® 85).

Further preferred adjuvant components b) are the components b3) which are based on phosphate or phosphonate chemistry. Especially preferred phosphate or phosphonate components are selected from the group consisting of c1) esters of phosphoric acid with alcohols selected from the group consisting of monohydric alkanols having 5 to 22 carbon atoms, diols or polyols, aryl, alkylaryl, poly(alkyl)aryl or poly (arylalkyl)aryl alcohols, alkoxyated alcohols obtained by reacting the above mentioned alcohols with alkylene oxides, and alkoxyated alcohols obtained by reacting monohydric alkanols with 1 to 4 carbon atoms and alkylene oxides, and c2) phosphonates based on alkyl-, aryl-, alkylaryl-, poly(alkyl)aryl- or poly(arylalkyl)arylphosphonic acids diesterified with alcohols and/or alkoxyated alcohols, with alcohols from the group consisting of monohydric alkanols having 1 to 22 carbon atoms, diols or polyols, aryl, alkylaryl, poly(alkyl)aryl and poly(arylalkyl)aryl alcohols and alkoxyated alcohols obtained by reacting the abovementioned alcohols with alkylene oxides. The above mentioned phosphate or phosphonate components and its preparation is described in EP 1164842B1. An especially preferred surface active component b) of this class is tris-(2-ethylhexyl)phosphate.

Further preferred adjuvant components b) are the components b2) which are based on butyl endcapped ethoxylated fatty acids of formula II as described in EP 1427280A0. When R_6 in formula II is an alkenyl group it may have one or more double bonds which may be in either cis or trans configuration(s). Preferably R_6 has from 1 to 3 double bonds. It is generally preferred that the double bond(s) are in the cis configuration. It is especially preferred that R_6 is a C_{18} branched chain alkyl or C_{18} alkenyl group for example oleyl or isostearyl (derived from the alcohol, 2-hexyl-dodecan-1-ol).

The value of n is preferably from 10 to 30 and especially from 10 to 20. The value of n may be an integer when a specific and uniform number of groups R_2O are introduced or may be an average value when a range of numbers of such groups are introduced.

The value of m is preferably 0. When R_8 is not hydrogen it is preferably a C_1 to C_4 alkyl group and in particular methyl or butyl. Butyl is especially preferred. Those skilled in the art will appreciate that an alkyl group R_8 represents an "end cap" to the terminal hydroxyl of the group



Since "end capping" a terminal ethylene oxide group (R_7 is ethyl) removes certain undesirable properties, it is desirable in order to achieve the objects of the invention to "end cap" substantially all of the terminal hydroxyl groups when R_7 is ethyl. Thus R_8 is not hydrogen when R_7 is ethyl. When R_7 is isopropyl on the other hand, R_8 may be hydrogen or alkyl since both moieties achieve the objects of the invention. It is thus possible to "end cap" only a proportion of the terminal hydroxyl groups such that R_8 is a mixture of hydrogen and alkyl groups.

As specific examples of the adjuvants of formula II especially suitable for the agrochemical compositions of the present invention there may be mentioned oleyl 10 propylene oxide (i.e. a compound of formula II wherein R_6 is oleyl, m is 0, R_7 is isopropylene, n is 10 and R_8 is hydrogen), oleyl 10 propylene oxide end-capped butyl ether (i.e. a compound of formula II wherein R_6 is oleyl, m is 0, R_7 is isopropylene, n is 10 and R_8 is butyl), oleyl 20 propylene oxide, oleyl 20 propylene oxide end-capped butyl ether, isostearyl 10 propylene oxide, isostearyl 20 propylene oxide, oleyl 10 ethylene oxide end-capped butyl ether, oleyl 20 ethylene oxide end-capped butyl ether, oleic acid 10 ethylene oxide end-capped methyl ether (i.e. a compound of formula II wherein R_6 is oleyl, m is 1, R_7 is ethylene, n is 10 and R_8 is methyl), oleic acid 20 ethylene oxide end-capped methyl ether.

Particularly preferred compositions according to the present invention comprises as oil additives mineral oil, sunflower oil or methylated rape seed oil.

Examples of oil additives suitable for the compositions according to the present invention, which comprise mixtures of oils or mineral oils, or the derivatives thereof, with surfactants, are Edenor ME SU®, Emery 2231®, Turbocharge® (Zeneca Agro, Stoney Creek, Ontario, CA), AGRIDEX® (Bayer AG) or Actipron® (BP Oil UK Limited, GB).

The application and efficacy of the oil additives can be improved by combining them with surface-active substances, such as non-ionic, anionic or cationic surfactants. Examples of suitable anionic, non-ionic, and cationic surfactants are listed in WO 97/34485 on pages 7 and 8.

Suitable surface-active substances are, depending on the type of the active ingredient to be formulated, non-ionic, cationic and/or anionic surfactants or surfactant mixtures which have good emulsifying, dispersing and wetting properties. The surfactants mentioned below are only to be considered as examples; a large number of further surfactants which are conventionally used in the art of formulation and suitable according to the invention are described in the relevant literature.

Suitable non-ionic surfactants are, especially, polyglycol ether derivatives of aliphatic or cycloaliphatic alcohols, of saturated or unsaturated fatty acids or of alkyl phenols which may contain approximately 3 to approximately 30 glycol ether groups and approximately 8 to approximately 20 carbon atoms in the (cyclo)aliphatic hydrocarbon radical or approximately 6 to approximately 18 carbon atoms in the alkyl moiety of the alkyl phenols. Also suitable are water-soluble polyethylene oxide adducts with polypropylene glycol, ethylenediaminopolypropylene glycol or alkyl polypropylene glycol having 1 to approximately 10 carbon atoms in the alkyl chain and approximately 20 to approximately 250 ethylene glycol ether groups and approximately 10 to approximately 100 propylene glycol ether groups. Normally, the abovementioned compounds contain 1 to approximately 5 ethylene glycol units per propylene glycol unit. Examples which may be mentioned are nonylphenoxypolyethoxyethanol, castor oil polyglycol ether, polypropylene glycol/polyethylene oxide adducts, tributylphenoxypolyethoxyethanol, polyethylene glycol or octylphenoxypolyethoxyethanol. Also suitable are fatty acid esters of polyoxyethylene sorbitan, such as polyoxyethylene sorbitan trioleate.

The cationic surfactants are, especially, quarternary ammonium salts which generally have at least one alkyl radical of approximately 8 to approximately 22 C atoms as substituents and as further substituents (unhalogenated or halogenated) lower alkyl or hydroxyalkyl or benzyl radicals. The salts are preferably in the form of halides, methylsulfates or ethylsulfates. Examples are stearyltrimethylammonium chloride and benzylbis(2-chloroethyl)ethylammonium bromide.

Examples of suitable anionic surfactants are water-soluble soaps or water-soluble synthetic surface-active compounds. Examples of suitable soaps are the alkali, alkaline earth or (unsubstituted or substituted) ammonium salts of fatty acids having approximately 10 to approximately 22 C atoms, such as the sodium or potassium salts of oleic or stearic acid, or of natural fatty acid mixtures which are obtainable for example from coconut or tall oil; mention must also be made of the fatty acid methyl taurates. However, synthetic surfactants are used more frequently, in particular fatty sulfonates, fatty sulfates, sulfonated benzimidazole derivatives or alkylaryl sulfonates. As a rule, the fatty sulfonates and fatty sulfates are present as alkali, alkaline earth or (substituted or unsubstituted) ammonium salts and they generally have an alkyl radical of approximately 8 to approximately 22 C atoms, alkyl also to be understood as including the alkyl moiety of acyl radicals; examples which may be mentioned are the sodium or calcium salts of lignosulfonic acid, of the dodecylsulfuric ester or of a fatty alcohol sulfate mixture prepared from natural fatty acids. This group also includes the salts of the sulfuric esters and sulfonic acids of fatty alcohol/ethylene oxide adducts. The sulfonated benzimidazole derivatives preferably contain 2 sulfonyl groups and a fatty acid radical of approximately 8 to approximately 22 C atoms. Examples of alkylarylsulfonates are the sodium, calcium or triethanolammonium salts of decylbenzenesulfonic acid, of dibutyl-naphthalenesulfonic acid or of a naphthalenesulfonic acid/formaldehyde condensate. Also possible are, furthermore, suitable phosphates, such as salts of the phosphoric ester of a p-nonylphenol/(4-14)ethylene oxide adduct, or phospholipids.

Preferred surface-active substances are anionic surfactants of the dodecylbenzene sulfonate type, especially the calcium salts thereof, as well as non-ionic surfactants of the fatty alcohol ethoxylate type. Especially preferred are ethoxylated C₁₂-C₂₂-fatty alcohols with a degree of ethoxylation of between 5 and 40. Examples of commercially available, preferred surfactants are the Genapol types (Clariant AG, Muttenz, Switzerland).

The concentration of surface-active substances in relation to the total additive is in general between 1 and 30% by weight.

Furthermore, the addition of an organic solvent to the oil additive/surfactant mixture can effect a further increase in efficacy. Suitable solvents are for example the Solvesso® (ESSO) or Aromatic Solvent® (Exxon Corporation) types. The concentration of such solvents may be from 10 to 80% by weight of the total weight.

Compositions comprising oil additives of this kind, which are also described for example in US-A-4,834,908, are a further embodiment of the present invention. A preferred oil additive is known under the name MERGE® which can be obtained from the BASF Corporation and is basically described for example in US-A-4,834,908 in column 5, as example COC-1. A further preferred oil additive according to the invention is SCORE® (Novartis Crop Protection Canada) and Adigor.

Typical rates of concentration are between 0.1 and 1000 ppm, preferably between 0.1 and 500 ppm, of active ingredient. The rate of application per hectare is generally 1 to 2000 g of active ingredient per hectare, in particular 10 to 1000 g/ha, preferably 10 to 600 g/ha. The adjuvant is applied so that the ratio of the adjuvant to the active ingredient lies in between 1:1 and 10000:1, preferably in between 10:1 and 5000:1.

Whereas concentrated compositions tend to be preferred for commercial goods, the end consumer as a rule uses concentrated products which can be diluted into any of the described compositions.

The formulations which are used to obtain the invention are prepared in a manner known per se, in the absence of auxiliaries for example by grinding, screening and/or compressing a solid active ingredient and in the presence of at least one auxiliary for example by intimately mixing and/or grinding the active ingredient with the auxiliary (auxiliaries).

The application methods for the compositions, that is the methods of controlling pests of the abovementioned type, such as spraying, atomizing, dusting, brushing on, dressing, scattering or pouring - which are to be selected to suit the intended aims of the prevailing circum-

stances - and the use of the compositions for controlling pests of the abovementioned type are other subjects of the invention.

A preferred method of application in the field of crop protection is application to the foliage of the plants (foliar application), it being possible to select frequency and rate of application to match the danger of infestation with the pest in question.

The compositions according to the present invention can be preferably formulated as emulsion concentrates, suspension concentrates, oil dispersions, suspoemulsions, wettable powders or wettable granules, suspension concentrates are especially preferred. In a preferred embodiment of the present invention, the adjuvant b) is added to a suspension concentrate which contains the compounds of formula I.

The adjuvant b) can either be build into the formulation concentrate which comprises the active or tank-mixed.

Examples for formulations suitable for tank mix with adjuvants b):

Emulsion Concentrates:

Active ingredient: 1-50%, preferably 1-20%
 Surfactants: 1-30%, preferably 5-25%
 Solvent: 2-98%, preferably 50-95%

Example F1:

Active ingredient	2%	5%	10%
Castor oil ethoxylate (36EO) (non-ionic surfactant)	10%	15%	15%
Ca-Dodecylbenzene sulfonate	5%	5%	5%
Acetophenone	20%	20%	20%
Triethylphosphate	Rest	30%	0%
N-Methylpyrrolidone	0	Rest	Rest

Suspension Concentrates:

Active ingredient: 5-65 %, preferably 10-50%

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Surfactants: 1-30%, preferably 2-25%
 Water: 2-98%, preferably 50-95%

Example F2:

Active ingredient	10%	20%	20%
Atlox 4913	1%	0%	1%
Sodium Lignosulfonate	0.5%	1%	2%
Tristyrenephenol(10EO)	2%	0%	4%
Tristyrenephenol(16EO)	0%	4%	0%
Blockcopolymer PO/EO	0%	2%	0%
Polydimethylsiloxane	0.5%	0.5%	0.5%
Propylene glycol	2.5%	2.5%	2.5%
Water	Rest	Rest	Rest

The finely ground active ingredient is mixed intimately with the additives. Suspensions of any desired concentration can be prepared from the thus resulting suspension concentrate by dilution with water.

Oil dispersions:

Active ingredient: 5-65 %, preferably 10-50%
 Surfactants: 1-30%, preferably 2-25%
 Oil: 2-98%, preferably 50-95%

Example F3:

Active ingredient	10%
Alkylated polyvinylpyrrolidone	2%
Castor oil ethoxylate (36EO)	9%
(non-ionic surfactant)	
Ca-Dodecylbenzene sulfonate	6%
Tristyrenephenol(10EO)	2%
Aromatic Solvent	Rest

Wettable Powders:

Active ingredient: 0.5-80 %, preferably 1-70%
 Surfactants: 0.5-30%, preferably 2-25%

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Carrier material: 1-98%, preferably 50-90%

Example F4:

Active ingredient	10%
Pergopak M	5%
Sodium Polycarboxylate	3%
Sodium Lignosulfonate	5%
Alkylarylsulphonate	3%
Kaolin Powder	Rest

Wettable granules:

Active ingredient: 0.5-80 %, preferably 1-70%
Surfactants: 0.5-30%, preferably 2-25%
Carrier material: 1-98%, preferably 50-90%

Example F5:

Active ingredient	10%
Sodium Lignosulfonate	30%
Silicon Oil Emulsion	2.0%
Celite 209	Rest

Examples of preferred adjuvant components b) according to the present invention are:

1. Oils

- a. Mineral oils: SUNSPRAY®, CROPSPRAY® (Sun Oil company, Belgium), Isopar® V (Exxon), paraffin oils, TURBOCHARGE® (Zeneca Agro, Stoney Creek, Ontario, CA), MERGE® (BASF) or Adigor®.
- b. Vegetable oils: oils obtained from plants, (especially sunflower, olive, soja, castor oil) and seed oils.

2. Fatty acids, esterified fatty acids, saponified fatty acids and blends thereof:

Emulsogen® M (Clariant) Tween® 80, Tween® 85

An example for a suitable blend is:

Ethoxylated Oleyl-polyglycoether (10 EO)	5%
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Ethoxylated Oleyl-polyglycolether (12 EO)	15%
Water	Rest

3. Phosphate and Phosphonates:

Example:

Trisethylhexyl phosphate	90%
Alkyl benzene sulfonic acid (C10 - C13)	4%
Polyoxyethylene alkyl amine	6%

4. Butyl endcapped (compounds of formula II)

Example:

Agnique F0H	20%
Mowiol 4	4%
Water	Rest

The activity of the compositions according to the invention can be broadened considerably, and adapted to prevailing circumstances, by adding other insecticidally, acaricidally and/or fungicidally active ingredients. The mixtures of the compounds of formula I with other insecticidally, acaricidally and/or fungicidally active ingredients may also have further surprising advantages which can also be described, in a wider sense, as synergistic activity. For example, better tolerance by plants, reduced phytotoxicity, insects can be controlled in their different development stages or better behaviour during their production, for example during grinding or mixing, during their storage or during their use.

Suitable additions to active ingredients here are, for example, representatives of the following classes of active ingredients: organophosphorus compounds, nitrophenol derivatives, thioureas, juvenile hormones, formamidines, benzophenone derivatives, ureas, pyrrole derivatives, carbamates, pyrethroids, chlorinated hydrocarbons, acylureas, pyridyl-methyleneamino derivatives, macrolides, neonicotinoids and *Bacillus thuringiensis* preparations.

The following mixtures of the compounds of formula I with active ingredients are preferred (the abbreviation "TX" means "one compound selected from the group consisting of the compounds of formula I described in Table 1 of the present invention"):

an adjuvant selected from the group of substances consisting of petroleum oils
(alternative name) (628) + TX,

an acaricide selected from the group of substances consisting of 1,1-bis(4-chlorophenyl)-2-ethoxyethanol (IUPAC name) (910) + TX, 2,4-dichlorophenyl benzenesulfonate (IUPAC/Chemical Abstracts name) (1059) + TX, 2-fluoro-*N*-methyl-*N*-1-naphthylacetamide (IUPAC name) (1295) + TX, 4-chlorophenyl phenyl sulfone (IUPAC name) (981) + TX, abamectin (1) + TX, acequinocyl (3) + TX, acetoprole [CCN] + TX, acrinathrin (9) + TX, aldicarb (16) + TX, aldoxycarb (863) + TX, alpha-cypermethrin (202) + TX, amidithion (870) + TX, amidoflumet [CCN] + TX, amidothioate (872) + TX, amiton (875) + TX, amiton hydrogen oxalate (875) + TX, amitraz (24) + TX, aramite (881) + TX, arsenous oxide (882) + TX, AVI 382 (compound code) + TX, AZ 60541 (compound code) + TX, azinphos-ethyl (44) + TX, azinphos-methyl (45) + TX, azobenzene (IUPAC name) (888) + TX, azocyclotin (46) + TX, azothoate (889) + TX, benomyl (62) + TX, benoxafos (alternative name) [CCN] + TX, benzoximate (71) + TX, benzyl benzoate (IUPAC name) [CCN] + TX, bifenazate (74) + TX, bifenthrin (76) + TX, binapacryl (907) + TX, brofenvalerate (alternative name) + TX, bromocyclen (918) + TX, bromophos (920) + TX, bromophos-ethyl (921) + TX, bromopropylate (94) + TX, buprofezin (99) + TX, butocarboxim (103) + TX, butoxycarboxim (104) + TX, butylpyridaben (alternative name) + TX, calcium polysulfide (IUPAC name) (111) + TX, camphechlor (941) + TX, carbanolate (943) + TX, carbaryl (115) + TX, carbofuran (118) + TX, carbophenothion (947) + TX, CGA 50'439 (development code) (125) + TX, chinomethionat (126) + TX, chlorbenside (959) + TX, chlordimeform (964) + TX, chlordimeform hydrochloride (964) + TX, chlorfenapyr (130) + TX, chlorfenethol (968) + TX, chlorfenson (970) + TX, chlorfensulphide (971) + TX, chlorfenvinphos (131) + TX, chlorobenzilate (975) + TX, chloromebuform (977) + TX, chloromethiuron (978) + TX, chloropropylate (983) + TX, chlorpyrifos (145) + TX, chlorpyrifos-methyl (146) + TX, chlorthiophos (994) + TX, cinerin I (696) + TX, cinerin II (696) + TX, cinerins (696) + TX, clofentezine (158) + TX, closantel (alternative name) [CCN] + TX, coumaphos (174) + TX, crotamiton (alternative name) [CCN] + TX, crotoxyphos (1010) + TX, cufraneb (1013) + TX, cyanthoate (1020) + TX, cyflumetofen (CAS Reg. No.: 400882-07-7) + TX, cyhalothrin (196) + TX,

cyhexatin (199) + TX, cypermethrin (201) + TX, DCPM (1032) + TX, DDT (219) + TX, demephion (1037) + TX, demephion-O (1037) + TX, demephion-S (1037) + TX, demeton (1038) + TX, demeton-methyl (224) + TX, demeton-O (1038) + TX, demeton-O-methyl (224) + TX, demeton-S (1038) + TX, demeton-S-methyl (224) + TX, demeton-S-methylsulphon (1039) + TX, diafenthuron (226) + TX, dialifos (1042) + TX, diazinon (227) + TX, dichlofluanid (230) + TX, dichlorvos (236) + TX, dicliphos (alternative name) + TX, dicofol (242) + TX, dicrotophos (243) + TX, dienochlor (1071) + TX, dimefox (1081) + TX, dimethoate (262) + TX, dinactin (alternative name) (653) + TX, dinex (1089) + TX, dinex-diclexine (1089) + TX, dinobuton (269) + TX, dinocap (270) + TX, dinocap-4 [CCN] + TX, dinocap-6 [CCN] + TX, dinocton (1090) + TX, dinopenton (1092) + TX, dinosulfon (1097) + TX, dinoterbon (1098) + TX, dioxathion (1102) + TX, diphenyl sulfone (IUPAC name) (1103) + TX, disulfiram (alternative name) [CCN] + TX, disulfoton (278) + TX, DNOC (282) + TX, dofenapyn (1113) + TX, doramectin (alternative name) [CCN] + TX, endosulfan (294) + TX, endothion (1121) + TX, EPN (297) + TX, eprinomectin (alternative name) [CCN] + TX, ethion (309) + TX, ethoate-methyl (1134) + TX, etoxazole (320) + TX, etrimfos (1142) + TX, fenazaflor (1147) + TX, fenazaquin (328) + TX, fenbutatin oxide (330) + TX, fenothiocarb (337) + TX, fenpropathrin (342) + TX, fenpyrad (alternative name) + TX, fenpyroximate (345) + TX, fenson (1157) + TX, fentrifanil (1161) + TX, fenvalerate (349) + TX, fipronil (354) + TX, fluacrypyrim (360) + TX, fluazuron (1166) + TX, flubenzimine (1167) + TX, flucycloxuron (366) + TX, flucythrinate (367) + TX, fluenetil (1169) + TX, flufenoxuron (370) + TX, flumethrin (372) + TX, fluorbenside (1174) + TX, fluvalinate (1184) + TX, FMC 1137 (development code) (1185) + TX, formetanate (405) + TX, formetanate hydrochloride (405) + TX, formothion (1192) + TX, formparanate (1193) + TX, gamma-HCH (430) + TX, glyodin (1205) + TX, halfenprox (424) + TX, heptenophos (432) + TX, hexadecyl cyclopropanecarboxylate (IUPAC/Chemical Abstracts name) (1216) + TX, hexythiazox (441) + TX, iodomethane (IUPAC name) (542) + TX, isocarbophos (alternative name) (473) + TX, isopropyl O-(methoxyaminothiophosphoryl)salicylate (IUPAC name) (473) + TX, ivermectin (alternative name) [CCN] + TX, jasmolin I (696) + TX, jasmolin II (696) + TX, jodfenphos (1248) + TX, lindane (430) + TX, lufenuron (490) + TX, malathion (492) + TX, malonoben (1254) + TX, mecarbam (502) + TX, mephosfolan (1261) + TX, mesulfen (alternative name) [CCN] + TX, methacrifos (1266) + TX, methamidophos (527) + TX, methidathion (529) + TX, methiocarb (530) + TX, methomyl (531) + TX, methyl bromide (537) + TX, metolcarb (550) + TX, mevinphos (556) + TX, mexacarbate (1290) + TX, milbemectin

(557) + TX, milbemycin oxime (alternative name) [CCN] + TX, mipafox (1293) + TX, monocrotophos (561) + TX, morphothion (1300) + TX, moxidectin (alternative name) [CCN] + TX, naled (567) + TX, NC-184 (compound code) + TX, NC-512 (compound code) + TX, nifluridide (1309) + TX, nikkomycins (alternative name) [CCN] + TX, nitrilacarb (1313) + TX, nitrilacarb 1:1 zinc chloride complex (1313) + TX, NNI-0101 (compound code) + TX, NNI-0250 (compound code) + TX, omethoate (594) + TX, oxamyl (602) + TX, oxydeprofos (1324) + TX, oxydisulfoton (1325) + TX, pp'-DDT (219) + TX, parathion (615) + TX, permethrin (626) + TX, petroleum oils (alternative name) (628) + TX, phenkapton (1330) + TX, phenthoate (631) + TX, phorate (636) + TX, phosalone (637) + TX, phosfolan (1338) + TX, phosmet (638) + TX, phosphamidon (639) + TX, phoxim (642) + TX, pirimiphos-methyl (652) + TX, polychloroterpenes (traditional name) (1347) + TX, polynactins (alternative name) (653) + TX, proclonol (1350) + TX, profenofos (662) + TX, promacyl (1354) + TX, propargite (671) + TX, propetamphos (673) + TX, propoxur (678) + TX, prothidathion (1360) + TX, prothoate (1362) + TX, pyrethrin I (696) + TX, pyrethrin II (696) + TX, pyrethrins (696) + TX, pyridaben (699) + TX, pyridaphenthion (701) + TX, pyrimidifen (706) + TX, pyrimitate (1370) + TX, quinalphos (711) + TX, quintiofos (1381) + TX, R-1492 (development code) (1382) + TX, RA-17 (development code) (1383) + TX, rotenone (722) + TX, schradan (1389) + TX, sebufos (alternative name) + TX, selamectin (alternative name) [CCN] + TX, SI-0009 (compound code) + TX, sophamide (1402) + TX, spiroadiclofen (738) + TX, spiromesifen (739) + TX, SSI-121 (development code) (1404) + TX, sulfiram (alternative name) [CCN] + TX, sulfluramid (750) + TX, sulfotep (753) + TX, sulfur (754) + TX, SZI-121 (development code) (757) + TX, tau-fluvalinate (398) + TX, tebufenpyrad (763) + TX, TEPP (1417) + TX, terbam (alternative name) + TX, tetrachlorvinphos (777) + TX, tetradifon (786) + TX, tetranactin (alternative name) (653) + TX, tetrasul (1425) + TX, thiafenox (alternative name) + TX, thiocarboxime (1431) + TX, thiofanox (800) + TX, thiometon (801) + TX, thioquinox (1436) + TX, thuringiensin (alternative name) [CCN] + TX, triamphos (1441) + TX, triarathene (1443) + TX, triazophos (820) + TX, triazuron (alternative name) + TX, trichlorfon (824) + TX, trifenofos (1455) + TX, trinactin (alternative name) (653) + TX, vamidothion (847) + TX, vaniliprole [CCN] and YI-5302 (compound code) + TX,

an algicide selected from the group of substances consisting of bethoxazin [CCN] + TX, copper dioctanoate (IUPAC name) (170) + TX, copper sulfate (172) + TX, cybutryne [CCN] + TX, dichlone (1052) + TX, dichlorophen (232) + TX, endothal (295) + TX,

fentin (347) + TX, hydrated lime [CCN] + TX, nabam (566) + TX, quinochloramine (714) + TX, quinonamid (1379) + TX, simazine (730) + TX, triphenyltin acetate (IUPAC name) (347) and triphenyltin hydroxide (IUPAC name) (347) + TX,

an anthelmintic selected from the group of substances consisting of abamectin (1) + TX, crufomate (1011) + TX, doramectin (alternative name) [CCN] + TX, emamectin (291) + TX, emamectin benzoate (291) + TX, eprinomectin (alternative name) [CCN] + TX, ivermectin (alternative name) [CCN] + TX, milbemycin oxime (alternative name) [CCN] + TX, moxidectin (alternative name) [CCN] + TX, piperazine [CCN] + TX, selamectin (alternative name) [CCN] + TX, spinosad (737) and thiophanate (1435) + TX,

an avicide selected from the group of substances consisting of chloralose (127) + TX, endrin (1122) + TX, fenthion (346) + TX, pyridin-4-amine (IUPAC name) (23) and strychnine (745) + TX,

a bactericide selected from the group of substances consisting of 1-hydroxy-1*H*-pyridine-2-thione (IUPAC name) (1222) + TX, 4-(quinoxalin-2-ylamino)benzenesulfonamide (IUPAC name) (748) + TX, 8-hydroxyquinoline sulfate (446) + TX, bronopol (97) + TX, copper dioctanoate (IUPAC name) (170) + TX, copper hydroxide (IUPAC name) (169) + TX, cresol [CCN] + TX, dichlorophen (232) + TX, dipyrithione (1105) + TX, dodicin (1112) + TX, fenaminosulf (1144) + TX, formaldehyde (404) + TX, hydrargaphen (alternative name) [CCN] + TX, kasugamycin (483) + TX, kasugamycin hydrochloride hydrate (483) + TX, nickel bis(dimethyldithiocarbamate) (IUPAC name) (1308) + TX, nitrapyrin (580) + TX, octhilineone (590) + TX, oxolinic acid (606) + TX, oxytetracycline (611) + TX, potassium hydroxyquinoline sulfate (446) + TX, probenazole (658) + TX, streptomycin (744) + TX, streptomycin sesquisulfate (744) + TX, tecloftalam (766) + TX, and thiomersal (alternative name) [CCN] + TX,

a biological agent selected from the group of substances consisting of *Adoxophyes orana* GV (alternative name) (12) + TX, *Agrobacterium radiobacter* (alternative name) (13) + TX, *Amblyseius* spp. (alternative name) (19) + TX, *Anagrapha falcifera* NPV (alternative name) (28) + TX, *Anagrus atomus* (alternative name) (29) + TX, *Aphelinus abdominalis* (alternative name) (33) + TX, *Aphidius colemani* (alternative name) (34) + TX, *Aphidoletes aphidimyza* (alternative name) (35) + TX, *Autographa californica* NPV (alternative name) (38) + TX, *Bacillus firmus* (alternative name) (48) + TX, *Bacillus sphaericus* Neide (scientific name) (49) + TX, *Bacillus thuringiensis* Berliner (scientific name) (51) + TX, *Bacillus thuringiensis* subsp. *aizawai* (scientific name) (51) + TX, *Bacillus thuringiensis* subsp. *israelensis* (scientific name) (51) + TX, *Bacillus thuringiensis* subsp. *japonensis*

(scientific name) (51) + TX, *Bacillus thuringiensis* subsp. *kurstaki* (scientific name) (51) + TX, *Bacillus thuringiensis* subsp. *tenebrionis* (scientific name) (51) + TX, *Beauveria bassiana* (alternative name) (53) + TX, *Beauveria brongniartii* (alternative name) (54) + TX, *Chrysoperla carnea* (alternative name) (151) + TX, *Cryptolaemus montrouzieri* (alternative name) (178) + TX, *Cydia pomonella* GV (alternative name) (191) + TX, *Dacnusa sibirica* (alternative name) (212) + TX, *Diglyphus isaea* (alternative name) (254) + TX, *Encarsia formosa* (scientific name) (293) + TX, *Eretmocerus eremicus* (alternative name) (300) + TX, *Helicoverpa zea* NPV (alternative name) (431) + TX, *Heterorhabditis bacteriophora* and *H. megidis* (alternative name) (433) + TX, *Hippodamia convergens* (alternative name) (442) + TX, *Leptomastix dactylopii* (alternative name) (488) + TX, *Macrolophus caliginosus* (alternative name) (491) + TX, *Mamestra brassicae* NPV (alternative name) (494) + TX, *Metaphycus helvolus* (alternative name) (522) + TX, *Metarhizium anisopliae* var. *acridum* (scientific name) (523) + TX, *Metarhizium anisopliae* var. *anisopliae* (scientific name) (523) + TX, *Neodiprion sertifer* NPV and *N. lecontei* NPV (alternative name) (575) + TX, *Orius* spp. (alternative name) (596) + TX, *Paecilomyces fumosoroseus* (alternative name) (613) + TX, *Phytoseiulus persimilis* (alternative name) (644) + TX, *Spodoptera exigua* multicapsid nuclear polyhedrosis virus (scientific name) (741) + TX, *Steinernema bibionis* (alternative name) (742) + TX, *Steinernema carpocapsae* (alternative name) (742) + TX, *Steinernema feltiae* (alternative name) (742) + TX, *Steinernema glaseri* (alternative name) (742) + TX, *Steinernema riobrave* (alternative name) (742) + TX, *Steinernema riobravus* (alternative name) (742) + TX, *Steinernema scapterisci* (alternative name) (742) + TX, *Steinernema* spp. (alternative name) (742) + TX, *Trichogramma* spp. (alternative name) (826) + TX, *Typhlodromus occidentalis* (alternative name) (844) and *Verticillium lecanii* (alternative name) (848) + TX,

a soil sterilant selected from the group of substances consisting of iodomethane (IUPAC name) (542) and methyl bromide (537) + TX,

a chemosterilant selected from the group of substances consisting of apholate [CCN] + TX, bisazir (alternative name) [CCN] + TX, busulfan (alternative name) [CCN] + TX, diflubenzuron (250) + TX, dimatif (alternative name) [CCN] + TX, hemel [CCN] + TX, hempa [CCN] + TX, metepa [CCN] + TX, methiotepa [CCN] + TX, methyl apholate [CCN] + TX, morzid [CCN] + TX, penfluron (alternative name) [CCN] + TX, tepa [CCN] + TX, thiohempa (alternative name) [CCN] + TX, thiotepa (alternative name) [CCN] + TX, tretamine (alternative name) [CCN] and uredepa (alternative name) [CCN] + TX,

an insect pheromone selected from the group of substances consisting of (*E*)-dec-5-en-1-yl acetate with (*E*)-dec-5-en-1-ol (IUPAC name) (222) + TX, (*E*)-tridec-4-en-1-yl acetate (IUPAC name) (829) + TX, (*E*)-6-methylhept-2-en-4-ol (IUPAC name) (541) + TX, (*E,Z*)-tetradeca-4,10-dien-1-yl acetate (IUPAC name) (779) + TX, (*Z*)-dodec-7-en-1-yl acetate (IUPAC name) (285) + TX, (*Z*)-hexadec-11-enal (IUPAC name) (436) + TX, (*Z*)-hexadec-11-en-1-yl acetate (IUPAC name) (437) + TX, (*Z*)-hexadec-13-en-11-yn-1-yl acetate (IUPAC name) (438) + TX, (*Z*)-icos-13-en-10-one (IUPAC name) (448) + TX, (*Z*)-tetradec-7-en-1-al (IUPAC name) (782) + TX, (*Z*)-tetradec-9-en-1-ol (IUPAC name) (783) + TX, (*Z*)-tetradec-9-en-1-yl acetate (IUPAC name) (784) + TX, (7*E*,9*Z*)-dodeca-7,9-dien-1-yl acetate (IUPAC name) (283) + TX, (9*Z*,11*E*)-tetradeca-9,11-dien-1-yl acetate (IUPAC name) (780) + TX, (9*Z*,12*E*)-tetradeca-9,12-dien-1-yl acetate (IUPAC name) (781) + TX, 14-methyloctadec-1-ene (IUPAC name) (545) + TX, 4-methylnonan-5-ol with 4-methylnonan-5-one (IUPAC name) (544) + TX, alpha-multistriatin (alternative name) [CCN] + TX, brevicomin (alternative name) [CCN] + TX, codlure (alternative name) [CCN] + TX, codlemone (alternative name) (167) + TX, cuelure (alternative name) (179) + TX, disparlure (277) + TX, dodec-8-en-1-yl acetate (IUPAC name) (286) + TX, dodec-9-en-1-yl acetate (IUPAC name) (287) + TX, dodeca-8 + TX, 10-dien-1-yl acetate (IUPAC name) (284) + TX, dominicalure (alternative name) [CCN] + TX, ethyl 4-methyloctanoate (IUPAC name) (317) + TX, eugenol (alternative name) [CCN] + TX, frontalinal (alternative name) [CCN] + TX, gossyplure (alternative name) (420) + TX, grandlure (421) + TX, grandlure I (alternative name) (421) + TX, grandlure II (alternative name) (421) + TX, grandlure III (alternative name) (421) + TX, grandlure IV (alternative name) (421) + TX, hexalure [CCN] + TX, ipsdienol (alternative name) [CCN] + TX, ipsenol (alternative name) [CCN] + TX, japonilure (alternative name) (481) + TX, lineatin (alternative name) [CCN] + TX, litlure (alternative name) [CCN] + TX, looplure (alternative name) [CCN] + TX, medlure [CCN] + TX, megatomoic acid (alternative name) [CCN] + TX, methyl eugenol (alternative name) (540) + TX, muscalure (563) + TX, octadeca-2,13-dien-1-yl acetate (IUPAC name) (588) + TX, octadeca-3,13-dien-1-yl acetate (IUPAC name) (589) + TX, orfralure (alternative name) [CCN] + TX, oryctalure (alternative name) (317) + TX, ostramone (alternative name) [CCN] + TX, siglure [CCN] + TX, sordidin (alternative name) (736) + TX, sulcatol (alternative name) [CCN] + TX, tetradec-11-en-1-yl acetate (IUPAC name) (785) + TX, trimedlure (839) + TX, trimedlure A (alternative name) (839) + TX, trimedlure B₁ (alternative name) (839) + TX, trimedlure B₂ (alternative name) (839) + TX, trimedlure C (alternative name) (839) and trunc-call (alternative name) [CCN] + TX,

an insect repellent selected from the group of substances consisting of 2-(octylthio)-ethanol (IUPAC name) (591) + TX, butopyronoxyl (933) + TX, butoxy(polypropylene glycol) (936) + TX, dibutyl adipate (IUPAC name) (1046) + TX, dibutyl phthalate (1047) + TX, dibutyl succinate (IUPAC name) (1048) + TX, diethyltoluamide [CCN] + TX, dimethyl carbate [CCN] + TX, dimethyl phthalate [CCN] + TX, ethyl hexanediol (1137) + TX, hexamide [CCN] + TX, methoquin-butyl (1276) + TX, methylneodecanamide [CCN] + TX, oxamate [CCN] and picaridin [CCN] + TX,

an insecticide selected from the group of substances consisting of 1-dichloro-1-nitroethane (IUPAC/Chemical Abstracts name) (1058) + TX, 1,1-dichloro-2,2-bis(4-ethylphenyl)ethane (IUPAC name) (1056), + TX, 1,2-dichloropropane (IUPAC/Chemical Abstracts name) (1062) + TX, 1,2-dichloropropane with 1,3-dichloropropene (IUPAC name) (1063) + TX, 1-bromo-2-chloroethane (IUPAC/Chemical Abstracts name) (916) + TX, 2,2,2-trichloro-1-(3,4-dichlorophenyl)ethyl acetate (IUPAC name) (1451) + TX, 2,2-dichlorovinyl 2-ethylsulfinyethyl methyl phosphate (IUPAC name) (1066) + TX, 2-(1,3-dithiolan-2-yl)phenyl dimethylcarbamate (IUPAC/ Chemical Abstracts name) (1109) + TX, 2-(2-butoxyethoxy)ethyl thiocyanate (IUPAC/Chemical Abstracts name) (935) + TX, 2-(4,5-dimethyl-1,3-dioxolan-2-yl)phenyl methylcarbamate (IUPAC/ Chemical Abstracts name) (1084) + TX, 2-(4-chloro-3,5-xylyloxy)ethanol (IUPAC name) (986) + TX, 2-chlorovinyl diethyl phosphate (IUPAC name) (984) + TX, 2-imidazolidone (IUPAC name) (1225) + TX, 2-isovalerylindan-1,3-dione (IUPAC name) (1246) + TX, 2-methyl(prop-2-ynyl)aminophenyl methylcarbamate (IUPAC name) (1284) + TX, 2-thiocyanatoethyl laurate (IUPAC name) (1433) + TX, 3-bromo-1-chloroprop-1-ene (IUPAC name) (917) + TX, 3-methyl-1-phenylpyrazol-5-yl dimethylcarbamate (IUPAC name) (1283) + TX, 4-methyl(prop-2-ynyl)amino-3,5-xylyl methylcarbamate (IUPAC name) (1285) + TX, 5,5-dimethyl-3-oxocyclohex-1-enyl dimethylcarbamate (IUPAC name) (1085) + TX, abamectin (1) + TX, acephate (2) + TX, acetamiprid (4) + TX, acethion (alternative name) [CCN] + TX, acetoprole [CCN] + TX, acrinathrin (9) + TX, acrylonitrile (IUPAC name) (861) + TX, alanycarb (15) + TX, aldicarb (16) + TX, aldoxycarb (863) + TX, aldrin (864) + TX, allethrin (17) + TX, allosamidin (alternative name) [CCN] + TX, allyxycarb (866) + TX, alpha-cypermethrin (202) + TX, alpha-ecdysone (alternative name) [CCN] + TX, aluminium phosphide (640) + TX, amidithion (870) + TX, amidothioate (872) + TX, aminocarb (873) + TX, amiton (875) + TX, amiton hydrogen oxalate (875) + TX, amitraz (24) + TX, anabasine (877) + TX, athidathion (883) + TX, AVI 382 (compound code) + TX, AZ 60541 (compound code) + TX, azadirachtin (alternative name) (41) + TX,

azamethiphos (42) + TX, azinphos-ethyl (44) + TX, azinphos-methyl (45) + TX, azothoate (889) + TX, *Bacillus thuringiensis* delta endotoxins (alternative name) (52) + TX, barium hexafluorosilicate (alternative name) [CCN] + TX, barium polysulfide (IUPAC/Chemical Abstracts name) (892) + TX, barthrin [CCN] + TX, Bayer 22/190 (development code) (893) + TX, Bayer 22408 (development code) (894) + TX, bendiocarb (58) + TX, benfuracarb (60) + TX, bensultap (66) + TX, beta-cyfluthrin (194) + TX, beta-cypermethrin (203) + TX, bifenthrin (76) + TX, bioallethrin (78) + TX, bioallethrin S-cyclopentenyl isomer (alternative name) (79) + TX, bioethanomethrin [CCN] + TX, biopermethrin (908) + TX, bioresmethrin (80) + TX, bis(2-chloroethyl) ether (IUPAC name) (909) + TX, bistrifluron (83) + TX, borax (86) + TX, brofenvalerate (alternative name) + TX, bromfenvinfos (914) + TX, bromocyclen (918) + TX, bromo-DDT (alternative name) [CCN] + TX, bromophos (920) + TX, bromophos-ethyl (921) + TX, bufencarb (924) + TX, buprofezin (99) + TX, butacarb (926) + TX, butathiofos (927) + TX, butocarboxim (103) + TX, butonate (932) + TX, butoxycarboxim (104) + TX, butylpyridaben (alternative name) + TX, cadusafos (109) + TX, calcium arsenate [CCN] + TX, calcium cyanide (444) + TX, calcium polysulfide (IUPAC name) (111) + TX, camphechlor (941) + TX, carbanolate (943) + TX, carbaryl (115) + TX, carbofuran (118) + TX, carbon disulfide (IUPAC/Chemical Abstracts name) (945) + TX, carbon tetrachloride (IUPAC name) (946) + TX, carbophenothion (947) + TX, carbosulfan (119) + TX, cartap (123) + TX, cartap hydrochloride (123) + TX, cevadine (alternative name) (725) + TX, chlorbicyclen (960) + TX, chlordane (128) + TX, chlordecone (963) + TX, chlordimeform (964) + TX, chlordimeform hydrochloride (964) + TX, chlorethoxyfos (129) + TX, chlorfenapyr (130) + TX, chlorfenvinphos (131) + TX, chlorfluazuron (132) + TX, chlormephos (136) + TX, chloroform [CCN] + TX, chloropicrin (141) + TX, chlorphoxim (989) + TX, chlorprazophos (990) + TX, chlorpyrifos (145) + TX, chlorpyrifos-methyl (146) + TX, chlorthiophos (994) + TX, chromafenozide (150) + TX, cinerin I (696) + TX, cinerin II (696) + TX, cinerins (696) + TX, cis-resmethrin (alternative name) + TX, cismethrin (80) + TX, clocythrin (alternative name) + TX, cloethocarb (999) + TX, closantel (alternative name) [CCN] + TX, clothianidin (165) + TX, copper acetoarsenite [CCN] + TX, copper arsenate [CCN] + TX, copper oleate [CCN] + TX, coumaphos (174) + TX, coumithoate (1006) + TX, crotamiton (alternative name) [CCN] + TX, crotoxyphos (1010) + TX, crufomate (1011) + TX, cryolite (alternative name) (177) + TX, CS 708 (development code) (1012) + TX, cyanofenphos (1019) + TX, cyanophos (184) + TX, cyanthoate (1020) + TX, cyclethrin [CCN] + TX, cycloprothrin (188) + TX, cyfluthrin (193) + TX, cyhalothrin (196) + TX,

cypermethrin (201) + TX, cyphenothrin (206) + TX, cyromazine (209) + TX, cythioate (alternative name) [CCN] + TX, d-limonene (alternative name) [CCN] + TX, d-tetramethrin (alternative name) (788) + TX, DAEP (1031) + TX, dazomet (216) + TX, DDT (219) + TX, decarbofuran (1034) + TX, deltamethrin (223) + TX, demephion (1037) + TX, demephion-O (1037) + TX, demephion-S (1037) + TX, demeton (1038) + TX, demeton-methyl (224) + TX, demeton-O (1038) + TX, demeton-O-methyl (224) + TX, demeton-S (1038) + TX, demeton-S-methyl (224) + TX, demeton-S-methylsulphon (1039) + TX, diafenthuron (226) + TX, dialifos (1042) + TX, diamidafos (1044) + TX, diazinon (227) + TX, dicapthon (1050) + TX, dichlofenthion (1051) + TX, dichlorvos (236) + TX, dicliphos (alternative name) + TX, dicresyl (alternative name) [CCN] + TX, dicrotophos (243) + TX, dicyclanil (244) + TX, dieldrin (1070) + TX, diethyl 5-methylpyrazol-3-yl phosphate (IUPAC name) (1076) + TX, diflubenzuron (250) + TX, dilor (alternative name) [CCN] + TX, dimefluthrin [CCN] + TX, dimefox (1081) + TX, dimetan (1085) + TX, dimethoate (262) + TX, dimethrin (1083) + TX, dimethylvinphos (265) + TX, dimetilan (1086) + TX, dinex (1089) + TX, dinex-diclexine (1089) + TX, dinoprop (1093) + TX, dinosam (1094) + TX, dinoseb (1095) + TX, dinotefuran (271) + TX, diofenolan (1099) + TX, dioxabenzofos (1100) + TX, dioxacarb (1101) + TX, dioxathion (1102) + TX, disulfoton (278) + TX, dithicrofos (1108) + TX, DNOC (282) + TX, doramectin (alternative name) [CCN] + TX, DSP (1115) + TX, ecdysterone (alternative name) [CCN] + TX, EI 1642 (development code) (1118) + TX, emamectin (291) + TX, emamectin benzoate (291) + TX, EMPC (1120) + TX, empenthrin (292) + TX, endosulfan (294) + TX, endothion (1121) + TX, endrin (1122) + TX, EPBP (1123) + TX, EPN (297) + TX, epofenonane (1124) + TX, eprinomectin (alternative name) [CCN] + TX, esfenvalerate (302) + TX, etaphos (alternative name) [CCN] + TX, ethiofencarb (308) + TX, ethion (309) + TX, ethiprole (310) + TX, ethoate-methyl (1134) + TX, ethoprophos (312) + TX, ethyl formate (IUPAC name) [CCN] + TX, ethyl-DDD (alternative name) (1056) + TX, ethylene dibromide (316) + TX, ethylene dichloride (chemical name) (1136) + TX, ethylene oxide [CCN] + TX, etofenprox (319) + TX, etrimfos (1142) + TX, EXD (1143) + TX, famphur (323) + TX, fenamiphos (326) + TX, fenazaflor (1147) + TX, fenchlorphos (1148) + TX, fenethacarb (1149) + TX, fenfluthrin (1150) + TX, fenitrothion (335) + TX, fenobucarb (336) + TX, fenoxacrim (1153) + TX, fenoxycarb (340) + TX, fenpirithrin (1155) + TX, fenpropathrin (342) + TX, fenpyrad (alternative name) + TX, fensulfothion (1158) + TX, fenthion (346) + TX, fenthion-ethyl [CCN] + TX, fenvalerate (349) + TX, fipronil (354) + TX, flonicamid (358) + TX, flubendiamide (CAS. Reg. No.: 272451-65-7) + TX, flucofuron (1168) + TX,

flucycloxuron (366) + TX, flucythrinate (367) + TX, fluenetil (1169) + TX, flufenerim [CCN] + TX, flufenoxuron (370) + TX, flufenprox (1171) + TX, flumethrin (372) + TX, fluvalinate (1184) + TX, FMC 1137 (development code) (1185) + TX, fonofos (1191) + TX, formetanate (405) + TX, formetanate hydrochloride (405) + TX, formothion (1192) + TX, formparanate (1193) + TX, fosmethilan (1194) + TX, fospirate (1195) + TX, fosthiazate (408) + TX, fosthietan (1196) + TX, furathiocarb (412) + TX, furethrin (1200) + TX, gamma-cyhalothrin (197) + TX, gamma-HCH (430) + TX, guazatine (422) + TX, guazatine acetates (422) + TX, GY-81 (development code) (423) + TX, halfenprox (424) + TX, halofenozide (425) + TX, HCH (430) + TX, HEOD (1070) + TX, heptachlor (1211) + TX, heptenophos (432) + TX, heterophos [CCN] + TX, hexaflumuron (439) + TX, HHDN (864) + TX, hydramethylnon (443) + TX, hydrogen cyanide (444) + TX, hydroprene (445) + TX, hyquincarb (1223) + TX, imidacloprid (458) + TX, imiprothrin (460) + TX, indoxacarb (465) + TX, iodomethane (IUPAC name) (542) + TX, IPSP (1229) + TX, isazofos (1231) + TX, isobenzan (1232) + TX, isocarbophos (alternative name) (473) + TX, isodrin (1235) + TX, isofenphos (1236) + TX, isolane (1237) + TX, isoprocab (472) + TX, isopropyl O-(methoxyaminothiophosphoryl)salicylate (IUPAC name) (473) + TX, isoprothiolane (474) + TX, isothioate (1244) + TX, isoxathion (480) + TX, ivermectin (alternative name) [CCN] + TX, jasmolin I (696) + TX, jasmolin II (696) + TX, jodfenphos (1248) + TX, juvenile hormone I (alternative name) [CCN] + TX, juvenile hormone II (alternative name) [CCN] + TX, juvenile hormone III (alternative name) [CCN] + TX, kelevan (1249) + TX, kinoprene (484) + TX, lambda-cyhalothrin (198) + TX, lead arsenate [CCN] + TX, lepimectin (CCN) + TX, leptophos (1250) + TX, lindane (430) + TX, lirimfos (1251) + TX, lufenuron (490) + TX, lythidathion (1253) + TX, *m*-cumenyl methylcarbamate (IUPAC name) (1014) + TX, magnesium phosphide (IUPAC name) (640) + TX, malathion (492) + TX, malonoben (1254) + TX, mazidox (1255) + TX, mecarbam (502) + TX, mecarphon (1258) + TX, menazon (1260) + TX, mephosfolan (1261) + TX, mercurous chloride (513) + TX, mesulfenfos (1263) + TX, metaflumizone (CCN) + TX, metam (519) + TX, metam-potassium (alternative name) (519) + TX, metam-sodium (519) + TX, methacrifos (1266) + TX, methamidophos (527) + TX, methanesulfonyl fluoride (IUPAC/Chemical Abstracts name) (1268) + TX, methidathion (529) + TX, methiocarb (530) + TX, methocrotophos (1273) + TX, methomyl (531) + TX, methoprene (532) + TX, methoquin-butyl (1276) + TX, methothrin (alternative name) (533) + TX, methoxychlor (534) + TX, methoxyfenozide (535) + TX, methyl bromide (537) + TX, methyl isothiocyanate (543) + TX, methylchloroform (alternative name) [CCN] + TX, methylene

chloride [CCN] + TX, metofluthrin [CCN] + TX, metolcarb (550) + TX, metoxadiazone (1288) + TX, mevinphos (556) + TX, mexacarbate (1290) + TX, milbemectin (557) + TX, milbemycin oxime (alternative name) [CCN] + TX, mipafox (1293) + TX, mirex (1294) + TX, monocrotophos (561) + TX, morphothion (1300) + TX, moxidectin (alternative name) [CCN] + TX, naftalofos (alternative name) [CCN] + TX, naled (567) + TX, naphthalene (IUPAC/Chemical Abstracts name) (1303) + TX, NC-170 (development code) (1306) + TX, NC-184 (compound code) + TX, nicotine (578) + TX, nicotine sulfate (578) + TX, nifluridide (1309) + TX, nitenpyram (579) + TX, nithiazine (1311) + TX, nitrilacarb (1313) + TX, nitrilacarb 1:1 zinc chloride complex (1313) + TX, NNI-0101 (compound code) + TX, NNI-0250 (compound code) + TX, nor nicotine (traditional name) (1319) + TX, novaluron (585) + TX, noviflumuron (586) + TX, O-5-dichloro-4-iodophenyl O-ethyl ethylphosphonothioate (IUPAC name) (1057) + TX, O,O-diethyl O-4-methyl-2-oxo-2H-chromen-7-yl phosphorothioate (IUPAC name) (1074) + TX, O,O-diethyl O-6-methyl-2-propylpyrimidin-4-yl phosphorothioate (IUPAC name) (1075) + TX, O,O,O',O'-tetrapropyl dithiopyrophosphate (IUPAC name) (1424) + TX, oleic acid (IUPAC name) (593) + TX, omethoate (594) + TX, oxamyl (602) + TX, oxydemeton-methyl (609) + TX, oxydeprofos (1324) + TX, oxydisulfoton (1325) + TX, pp'-DDT (219) + TX, para-dichlorobenzene [CCN] + TX, parathion (615) + TX, parathion-methyl (616) + TX, penfluron (alternative name) [CCN] + TX, pentachlorophenol (623) + TX, pentachlorophenyl laurate (IUPAC name) (623) + TX, permethrin (626) + TX, petroleum oils (alternative name) (628) + TX, PH 60-38 (development code) (1328) + TX, phenkapton (1330) + TX, phenothrin (630) + TX, phenthoate (631) + TX, phorate (636) + TX, phosalone (637) + TX, phosfolan (1338) + TX, phosmet (638) + TX, phosnichlor (1339) + TX, phosphamidon (639) + TX, phosphine (IUPAC name) (640) + TX, phoxim (642) + TX, phoxim-methyl (1340) + TX, pirimetaphos (1344) + TX, pirimicarb (651) + TX, pirimiphos-ethyl (1345) + TX, pirimiphos-methyl (652) + TX, polychlorodicyclopentadiene isomers (IUPAC name) (1346) + TX, polychloroterpenes (traditional name) (1347) + TX, potassium arsenite [CCN] + TX, potassium thiocyanate [CCN] + TX, prallethrin (655) + TX, precocene I (alternative name) [CCN] + TX, precocene II (alternative name) [CCN] + TX, precocene III (alternative name) [CCN] + TX, primidophos (1349) + TX, profenofos (662) + TX, profluthrin [CCN] + TX, promacyl (1354) + TX, promecarb (1355) + TX, propaphos (1356) + TX, propetamphos (673) + TX, propoxur (678) + TX, prothidathion (1360) + TX, prothiofos (686) + TX, prothoate (1362) + TX, protrifenbute [CCN] + TX, pymetrozine (688) + TX, pyraclofos (689) + TX, pyrazophos (693) + TX, pyresmethrin (1367) + TX, pyrethrin I (696) + TX,

pyrethrin II (696) + TX, pyrethrins (696) + TX, pyridaben (699) + TX, pyridalyl (700) + TX, pyridaphenthion (701) + TX, pyrimidifen (706) + TX, pyrimitate (1370) + TX, pyriproxyfen (708) + TX, quassia (alternative name) [CCN] + TX, quinalphos (711) + TX, quinalphos-methyl (1376) + TX, quinothion (1380) + TX, quintiofos (1381) + TX, R-1492 (development code) (1382) + TX, rafoxanide (alternative name) [CCN] + TX, resmethrin (719) + TX, rotenone (722) + TX, RU 15525 (development code) (723) + TX, RU 25475 (development code) (1386) + TX, ryania (alternative name) (1387) + TX, ryanodine (traditional name) (1387) + TX, sabadilla (alternative name) (725) + TX, schradan (1389) + TX, sebufos (alternative name) + TX, selamectin (alternative name) [CCN] + TX, SI-0009 (compound code) + TX, SI-0205 (compound code) + TX, SI-0404 (compound code) + TX, SI-0405 (compound code) + TX, silafluofen (728) + TX, SN 72129 (development code) (1397) + TX, sodium arsenite [CCN] + TX, sodium cyanide (444) + TX, sodium fluoride (IUPAC/Chemical Abstracts name) (1399) + TX, sodium hexafluorosilicate (1400) + TX, sodium pentachlorophenoxide (623) + TX, sodium selenate (IUPAC name) (1401) + TX, sodium thiocyanate [CCN] + TX, sophamide (1402) + TX, spinosad (737) + TX, spiromesifen (739) + TX, spirotetmat (CCN) + TX, sulcofuron (746) + TX, sulcofuron-sodium (746) + TX, sulfluramid (750) + TX, sulfotep (753) + TX, sulfuryl fluoride (756) + TX, sulprofos (1408) + TX, tar oils (alternative name) (758) + TX, tau-fluvalinate (398) + TX, tazimcarb (1412) + TX, TDE (1414) + TX, tebufenozide (762) + TX, tebufenpyrad (763) + TX, tebupirimfos (764) + TX, teflubenzuron (768) + TX, tefluthrin (769) + TX, temephos (770) + TX, TEPP (1417) + TX, terallethrin (1418) + TX, terbam (alternative name) + TX, terbufos (773) + TX, tetrachloroethane [CCN] + TX, tetrachlorvinphos (777) + TX, tetramethrin (787) + TX, theta-cypermethrin (204) + TX, thiacloprid (791) + TX, thiafenox (alternative name) + TX, thiamethoxam (792) + TX, thicofos (1428) + TX, thiocarboxime (1431) + TX, thiocyclam (798) + TX, thiocyclam hydrogen oxalate (798) + TX, thiodicarb (799) + TX, thiofanox (800) + TX, thiometon (801) + TX, thionazin (1434) + TX, thiosultap (803) + TX, thiosultap-sodium (803) + TX, thuringiensin (alternative name) [CCN] + TX, tolfenpyrad (809) + TX, tralomethrin (812) + TX, transfluthrin (813) + TX, transpermethrin (1440) + TX, triamiphos (1441) + TX, triazamate (818) + TX, triazophos (820) + TX, triazuron (alternative name) + TX, trichlorfon (824) + TX, trichlormetaphos-3 (alternative name) [CCN] + TX, trichloronat (1452) + TX, trifenofos (1455) + TX, triflumuron (835) + TX, trimethacarb (840) + TX, triprene (1459) + TX, vamidothion (847) + TX, vaniliprole [CCN] + TX, veratridine (alternative name) (725) + TX, veratrine (alternative name) (725) + TX, XMC (853) + TX, xylylcarb (854) + TX, YI-5302

(compound code) + TX, zeta-cypermethrin (205) + TX, zetamethrin (alternative name) + TX, zinc phosphide (640) + TX, zolaprofos (1469) and ZXI 8901 (development code) (858) + TX,

a molluscicide selected from the group of substances consisting of bis(tributyltin) oxide (IUPAC name) (913) + TX, bromoacetamide [CCN] + TX, calcium arsenate [CCN] + TX, cloethocarb (999) + TX, copper acetoarsenite [CCN] + TX, copper sulfate (172) + TX, fentin (347) + TX, ferric phosphate (IUPAC name) (352) + TX, metaldehyde (518) + TX, methiocarb (530) + TX, niclosamide (576) + TX, niclosamide-olamine (576) + TX, pentachlorophenol (623) + TX, sodium pentachlorophenoxide (623) + TX, tazimcarb (1412) + TX, thiodicarb (799) + TX, tributyltin oxide (913) + TX, trifenmorph (1454) + TX, trimethacarb (840) + TX, triphenyltin acetate (IUPAC name) (347) and triphenyltin hydroxide (IUPAC name) (347) + TX,

a nematocide selected from the group of substances consisting of AKD-3088 (compound code) + TX, 1,2-dibromo-3-chloropropane (IUPAC/Chemical Abstracts name) (1045) + TX, 1,2-dichloropropane (IUPAC/ Chemical Abstracts name) (1062) + TX, 1,2-dichloropropane with 1,3-dichloropropene (IUPAC name) (1063) + TX, 1,3-dichloropropene (233) + TX, 3,4-dichlorotetrahydrothiophene 1,1-dioxide (IUPAC/Chemical Abstracts name) (1065) + TX, 3-(4-chlorophenyl)-5-methylrhodanine (IUPAC name) (980) + TX, 5-methyl-6-thioxo-1,3,5-thiadiazinan-3-ylacetic acid (IUPAC name) (1286) + TX, 6-isopentenylaminopurine (alternative name) (210) + TX, abamectin (1) + TX, acetoprole [CCN] + TX, alanycarb (15) + TX, aldicarb (16) + TX, aldoxycarb (863) + TX, AZ 60541 (compound code) + TX, benclothiaz [CCN] + TX, benomyl (62) + TX, butylpyridaben (alternative name) + TX, cadusafos (109) + TX, carbofuran (118) + TX, carbon disulfide (945) + TX, carbosulfan (119) + TX, chloropicrin (141) + TX, chlorpyrifos (145) + TX, cloethocarb (999) + TX, cytokinins (alternative name) (210) + TX, dazomet (216) + TX, DBCP (1045) + TX, DCIP (218) + TX, diamidafos (1044) + TX, dichlofenthion (1051) + TX, dicliphos (alternative name) + TX, dimethoate (262) + TX, doramectin (alternative name) [CCN] + TX, emamectin (291) + TX, emamectin benzoate (291) + TX, eprinomectin (alternative name) [CCN] + TX, ethoprophos (312) + TX, ethylene dibromide (316) + TX, fenamiphos (326) + TX, fenpyrad (alternative name) + TX, fensulfothion (1158) + TX, fosthiazate (408) + TX, fosthietan (1196) + TX, furfural (alternative name) [CCN] + TX, GY-81 (development code) (423) + TX, heterophos [CCN] + TX, iodomethane (IUPAC name) (542) + TX, isamidofos (1230) + TX, isazofos (1231) + TX, ivermectin (alternative name) [CCN] + TX, kinetin (alternative name) (210) + TX,

mecarphon (1258) + TX, metam (519) + TX, metam-potassium (alternative name) (519) + TX, metam-sodium (519) + TX, methyl bromide (537) + TX, methyl isothiocyanate (543) + TX, milbemycin oxime (alternative name) [CCN] + TX, moxidectin (alternative name) [CCN] + TX, *Myrothecium verrucaria* composition (alternative name) (565) + TX, NC-184 (compound code) + TX, oxamyl (602) + TX, phorate (636) + TX, phosphamidon (639) + TX, phosphocarb [CCN] + TX, sebufos (alternative name) + TX, selamectin (alternative name) [CCN] + TX, spinosad (737) + TX, terbam (alternative name) + TX, terbufos (773) + TX, tetrachlorothiophene (IUPAC/ Chemical Abstracts name) (1422) + TX, thiafenox (alternative name) + TX, thionazin (1434) + TX, triazophos (820) + TX, triazuron (alternative name) + TX, xilenols [CCN] + TX, YI-5302 (compound code) and zeatin (alternative name) (210) + TX,

a nitrification inhibitor selected from the group of substances consisting of potassium ethylxanthate [CCN] and nitrapyrin (580) + TX,

a plant activator selected from the group of substances consisting of acibenzolar (6) + TX, acibenzolar-S-methyl (6) + TX, probenazole (658) and *Reynoutria sachalinensis* extract (alternative name) (720) + TX,

a rodenticide selected from the group of substances consisting of 2-isovalerylindan-1,3-dione (IUPAC name) (1246) + TX, 4-(quinoxalin-2-ylamino)benzenesulfonamide (IUPAC name) (748) + TX, alpha-chlorohydrin [CCN] + TX, aluminium phosphide (640) + TX, antu (880) + TX, arsenous oxide (882) + TX, barium carbonate (891) + TX, bithiosemi (912) + TX, brodifacoum (89) + TX, bromadiolone (91) + TX, bromethalin (92) + TX, calcium cyanide (444) + TX, chloralose (127) + TX, chlorophacinone (140) + TX, cholecalciferol (alternative name) (850) + TX, coumachlor (1004) + TX, coumafuryl (1005) + TX, coumatetralyl (175) + TX, crimidine (1009) + TX, difenacoum (246) + TX, difethialone (249) + TX, diphacinone (273) + TX, ergocalciferol (301) + TX, flocoumafen (357) + TX, fluoroacetamide (379) + TX, flupropadine (1183) + TX, flupropadine hydrochloride (1183) + TX, gamma-HCH (430) + TX, HCH (430) + TX, hydrogen cyanide (444) + TX, iodomethane (IUPAC name) (542) + TX, lindane (430) + TX, magnesium phosphide (IUPAC name) (640) + TX, methyl bromide (537) + TX, norbormide (1318) + TX, phosacetim (1336) + TX, phosphine (IUPAC name) (640) + TX, phosphorus [CCN] + TX, pindone (1341) + TX, potassium arsenite [CCN] + TX, pyrinuron (1371) + TX, scilliroside (1390) + TX, sodium arsenite [CCN] + TX, sodium cyanide (444) + TX, sodium fluoroacetate (735) + TX, strychnine (745) + TX, thallium sulfate [CCN] + TX, warfarin (851) and zinc phosphide (640) + TX,

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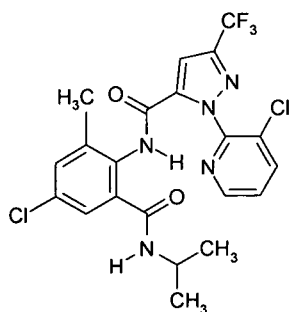
a synergist selected from the group of substances consisting of 2-(2-butoxyethoxy)-ethyl piperonylate (IUPAC name) (934) + TX, 5-(1,3-benzodioxol-5-yl)-3-hexylcyclohex-2-enone (IUPAC name) (903) + TX, farnesol with nerolidol (alternative name) (324) + TX, MB-599 (development code) (498) + TX, MGK 264 (development code) (296) + TX, piperonyl butoxide (649) + TX, piprotal (1343) + TX, propyl isomer (1358) + TX, S421 (development code) (724) + TX, sesamex (1393) + TX, sesasmolin (1394) and sulfoxide (1406) + TX,

an animal repellent selected from the group of substances consisting of anthraquinone (32) + TX, chloralose (127) + TX, copper naphthenate [CCN] + TX, copper oxychloride (171) + TX, diazinon (227) + TX, dicyclopentadiene (chemical name) (1069) + TX, guazatine (422) + TX, guazatine acetates (422) + TX, methiocarb (530) + TX, pyridin-4-amine (IUPAC name) (23) + TX, thiram (804) + TX, trimethacarb (840) + TX, zinc naphthenate [CCN] and ziram (856) + TX,

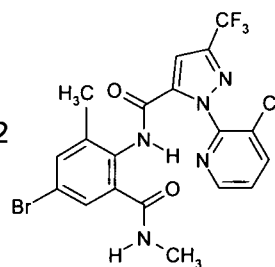
a virucide selected from the group of substances consisting of imanin (alternative name) [CCN] and ribavirin (alternative name) [CCN] + TX,

a wound protectant selected from the group of substances consisting of mercuric oxide (512) + TX, octhilinone (590) and thiophanate-methyl (802) + TX,

an insecticide selected from the group consisting of the compound of formula A-1

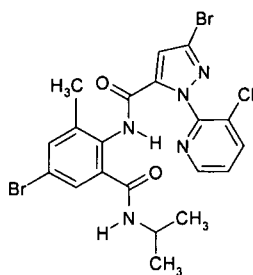


(A-1) + TX, the formula A-2

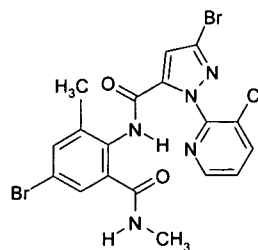


(A-2) + TX,

the formula A-3



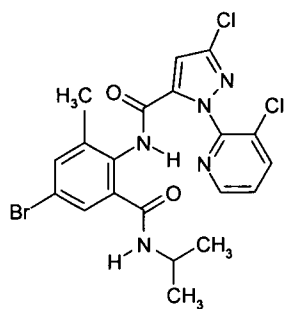
(A-3) + TX, the formula A-4



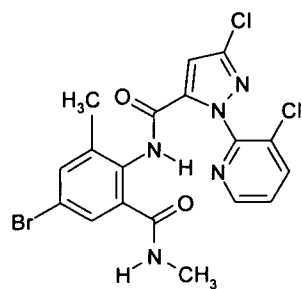
(A-4) + TX,

the formula A-5

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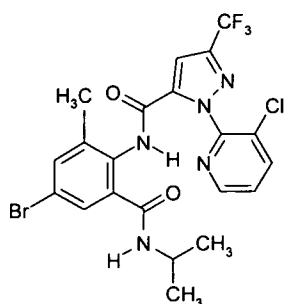


(A-5) + TX, the formula A-6

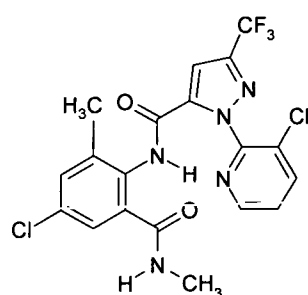


(A-6) + TX,

the formula A-7

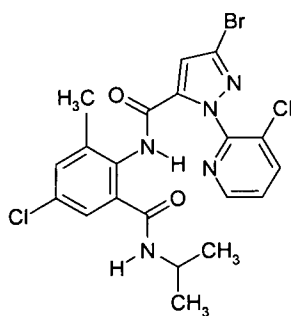


(A-7) + TX, the formula A-8

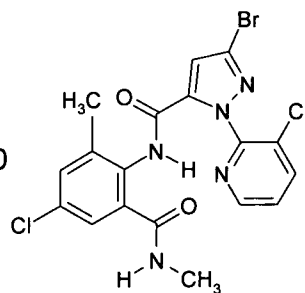


(A-8) + TX,

the formula A-9

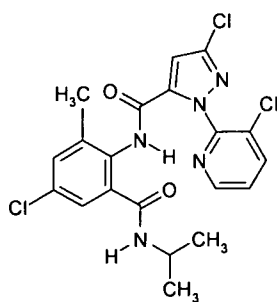


(A-9) + TX, the formula A-10

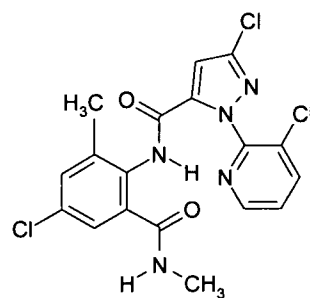


(A-10) + TX,

the formula A-11

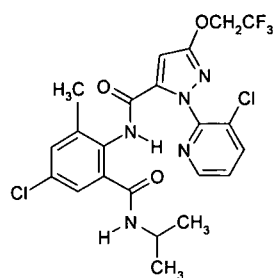


(A-11) + TX, the formula A-12

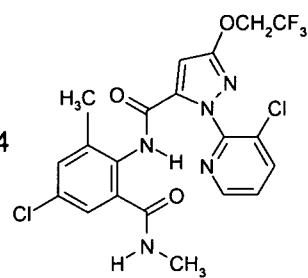


(A-12) + TX,

the formula A-13

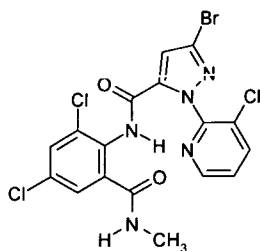


(A-13) + TX, the formula A-14

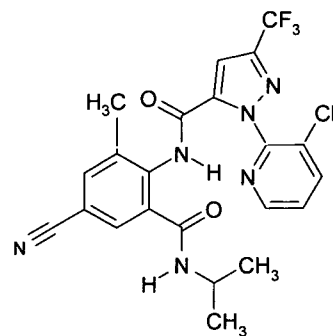


(A-14) + TX,

the formula A-15

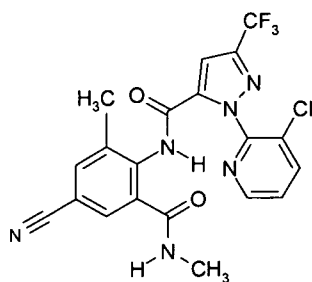


(A-15) + TX, the formula A-16

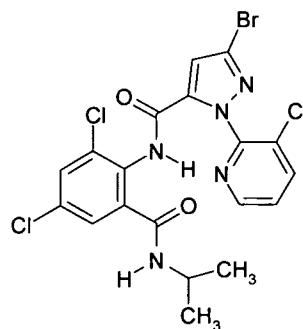


(A-16) + TX,

the formula A-17

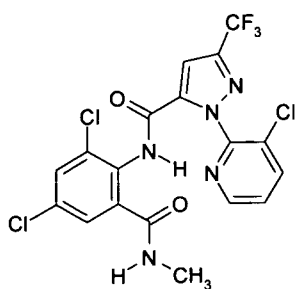


(A-17) + TX, the formula A-18

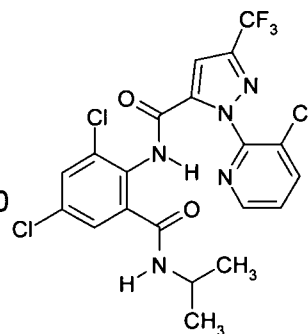


(A-18) + TX,

the formula A-19



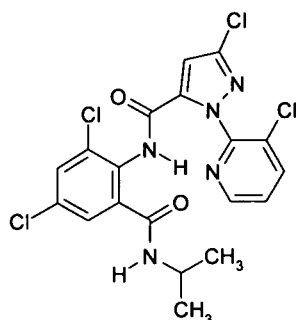
(A-19) + TX, the formula A-20



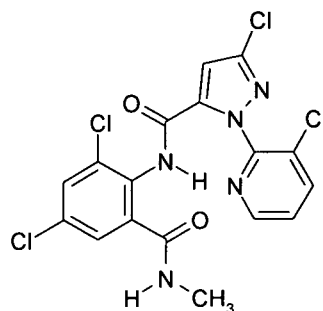
(A-20) + TX,

the formula A-21

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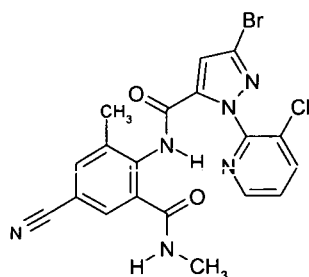


(A-21) + TX, the formula A-22

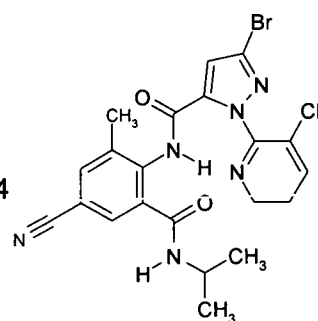


(A-22) + TX,

the formula A-23

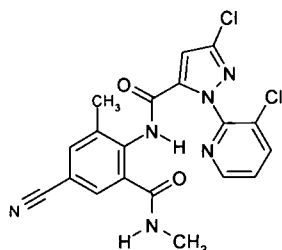


(A-23) + TX, the formula A-24

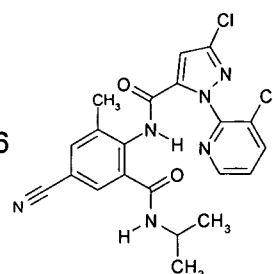


(A-24) + TX,

the formula A-25



(A-25) + TX, and the formula A-26



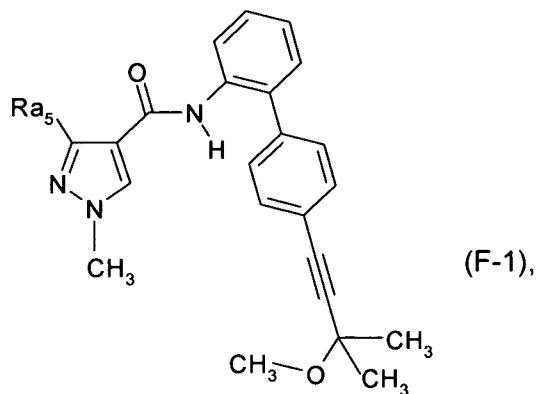
(A-26) + TX,

and biologically active compounds selected from the group consisting of Azaconazole [60207-31-0] + TX, Bitertanol [70585-36-3] + TX, Bromuconazole [116255-48-2] + TX, Cyproconazole [94361-06-5] + TX, Difenoconazole [119446-68-3] + TX, Diniconazole [83657-24-3] + TX, Epoxiconazole [106325-08-0] + TX, Fenbuconazole [114369-43-6] + TX, Fluquinconazole [136426-54-5] + TX, Flusilazole [85509-19-9] + TX, Flutriafol [76674-21-0] + TX, Hexaconazole [79983-71-4] + TX, Imazalil [35554-44-0] + TX, Imibenconazole [86598-92-7] + TX, Ipconazole [125225-28-7] + TX, Metconazole [125116-23-6] + TX, Myclobutanil [88671-89-0] + TX, Pefurazoate [101903-30-4] + TX, Penconazole [66246-88-6] + TX, Prothioconazole [178928-70-6] + TX, Pyrifeno-

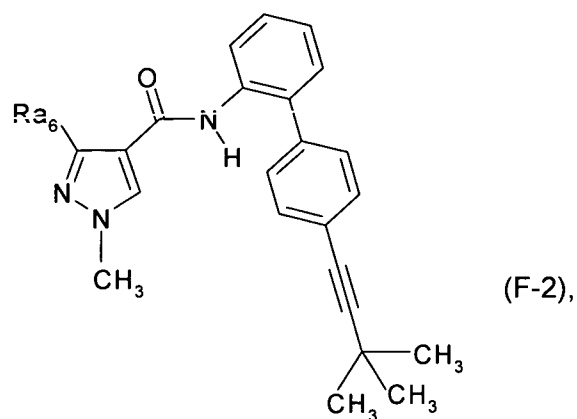
[88283-41-4] + TX, Prochloraz [67747-09-5] + TX, Propiconazole [60207-90-1] + TX, Simeconazole [149508-90-7] + TX, Tebuconazole [107534-96-3] + TX, Tetraconazole [112281-77-3] + TX, Triadimefon [43121-43-3] + TX, Triadimenol [55219-65-3] + TX, Triflumizole [99387-89-0] + TX, Triticonazole [131983-72-7] + TX, Ancymidol [12771-68-5] + TX, Fenarimol [60168-88-9] + TX, Nuarimol [63284-71-9] + TX, Bupirimate [41483-43-6] + TX, Dimethirimol [5221-53-4] + TX, Ethirimol [23947-60-6] + TX, Dodemorph [1593-77-7] + TX, Fenpropidine [67306-00-7] + TX, Fenpropimorph [67564-91-4] + TX, Spiroxamine [118134-30-8] + TX, Tridemorph [81412-43-3] + TX, Cyprodinil [121552-61-2] + TX, Mepanipyrim [110235-47-7] + TX, Pyrimethanil [53112-28-0] + TX, Fenpiclonil [74738-17-3] + TX, Fludioxonil [131341-86-1] + TX, Benalaxyl [71626-11-4] + TX, Furalaxyl [57646-30-7] + TX, Metalaxyl [57837-19-1] + TX, R-Metalaxyl [70630-17-0] + TX, Ofurace [58810-48-3] + TX, Oxadixyl [77732-09-3] + TX, Benomyl [17804-35-2] + TX, Carbendazim [10605-21-7] + TX, Debacarb [62732-91-6] + TX, Fuberidazole [3878-19-1] + TX, Thiabendazole [148-79-8] + TX, Chlozolate [84332-86-5] + TX, Dichlozoline [24201-58-9] + TX, Iprodione [36734-19-7] + TX, Myclozoline [54864-61-8] + TX, Procymidone [32809-16-8] + TX, Vinclozoline [50471-44-8] + TX, Boscalid [188425-85-6] + TX, Carboxin [5234-68-4] + TX, Fenfuram [24691-80-3] + TX, Flutolanil [66332-96-5] + TX, Mepronil [55814-41-0] + TX, Oxycarboxin [5259-88-1] + TX, Penthiopyrad [183675-82-3] + TX, Thifluzamide [130000-40-7] + TX, Guazatine [108173-90-6] + TX, Dodine [2439-10-3] [112-65-2] (freie Base) + TX, Iminoctadine [13516-27-3] + TX, Azoxystrobin [131860-33-8] + TX, Dimoxystrobin [149961-52-4] + TX, enestroburin {Proc. BCPC, Int. Congr., Glasgow, 2003, 1, 93} + TX, Fluoxastrobin [361377-29-9] + TX, Kresoxim-methyl [143390-89-0] + TX, Metominostrobin [133408-50-1] + TX, Trifloxystrobin [141517-21-7] + TX, Orysastrobin [248593-16-0] + TX, Picoxystrobin [117428-22-5] + TX, Pyraclostrobin [175013-18-0] + TX, Ferbam [14484-64-1] + TX, Mancozeb [8018-01-7] + TX, Maneb [12427-38-2] + TX, Metiram [9006-42-2] + TX, Propineb [12071-83-9] + TX, Thiram [137-26-8] + TX, Zineb [12122-67-7] + TX, Ziram [137-30-4] + TX, Captafol [2425-06-1] + TX, Captan [133-06-2] + TX, Dichlofluanid [1085-98-9] + TX, Fluoroimide [41205-21-4] + TX, Folpet [133-07-3] + TX, Tolyfluanid [731-27-1] + TX, Bordeaux Mixture [8011-63-0] + TX, Copperhydroxid [20427-59-2] + TX, Copperoxychlorid [1332-40-7] + TX, Coppersulfat [7758-98-7] + TX, Copperoxid [1317-

39-1] + TX, Mancopper [53988-93-5] + TX, Oxine-copper [10380-28-6] + TX, Dinocap [131-72-6] + TX, Nitrothal-isopropyl [10552-74-6] + TX, Edifenphos [17109-49-8] + TX, Iprobenphos [26087-47-8] + TX, Isoprothiolane [50512-35-1] + TX, Phosdiphen [36519-00-3] + TX, Pyrazophos [13457-18-6] + TX, Tolclofos-methyl [57018-04-9] + TX, Acibenzolar-S-methyl [135158-54-2] + TX, Anilazine [101-05-3] + TX, Benthiavalicarb [413615-35-7] + TX, Blastidicin-S [2079-00-7] + TX, Chinomethionat [2439-01-2] + TX, Chloroneb [2675-77-6] + TX, Chlorothalonil [1897-45-6] + TX, Cyflufenamid [180409-60-3] + TX, Cymoxanil [57966-95-7] + TX, Dichlone [117-80-6] + TX, Diclocymet [139920-32-4] + TX, Diclomezine [62865-36-5] + TX, Dicloran [99-30-9] + TX, Diethofencarb [87130-20-9] + TX, Dimethomorph [110488-70-5] + TX, SYP-LI90 (Flumorph) [211867-47-9] + TX, Dithianon [3347-22-6] + TX, Ethaboxam [162650-77-3] + TX, Etridiazole [2593-15-9] + TX, Famoxadone [131807-57-3] + TX, Fenamidone [161326-34-7] + TX, Fenoxanil [115852-48-7] + TX, Fentin [668-34-8] + TX, Ferimzone [89269-64-7] + TX, Fluazinam [79622-59-6] + TX, Fluopicolide [239110-15-7] + TX, Flusulfamide [106917-52-6] + TX, Fenhexamid [126833-17-8] + TX, Fosetyl-aluminium [39148-24-8] + TX, Hymexazol [10004-44-1] + TX, Iprovalicarb [140923-17-7] + TX, IKF-916 (Cyazofamid) [120116-88-3] + TX, Kasugamycin [6980-18-3] + TX, Methasulfocarb [66952-49-6] + TX, Metrafenone [220899-03-6] + TX, Pencycuron [66063-05-6] + TX, Phthalide [27355-22-2] + TX, Polyoxins [11113-80-7] + TX, Probenazole [27605-76-1] + TX, Propamocarb [25606-41-1] + TX, Proquinazid [189278-12-4] + TX, Pyroquilon [57369-32-1] + TX, Quinoxifen [124495-18-7] + TX, Quintozene [82-68-8] + TX, Schwefel [7704-34-9] + TX, Tiadinil [223580-51-6] + TX, Triazoxide [72459-58-6] + TX, Tricyclazole [41814-78-2] + TX, Triforine [26644-46-2] + TX, Validamycin [37248-47-8] + TX, Zoxamide (RH7281) [156052-68-5] + TX, Mandipropamid [374726-62-2] + TX, the compound of formula F-1

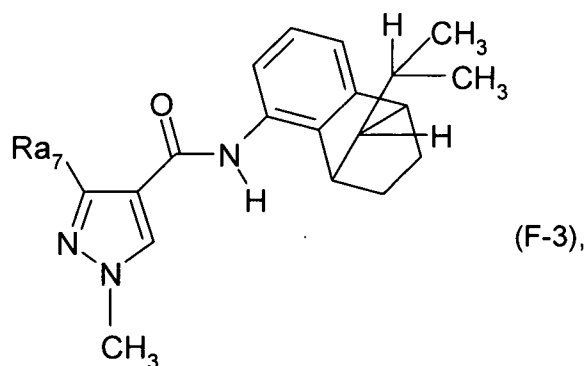
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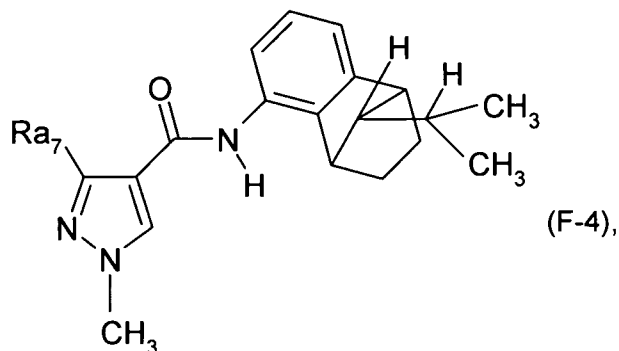
wherein Ra_5 is trifluoromethyl or difluoromethyl (WO2004/058723) + TX, the compound of formula F-2



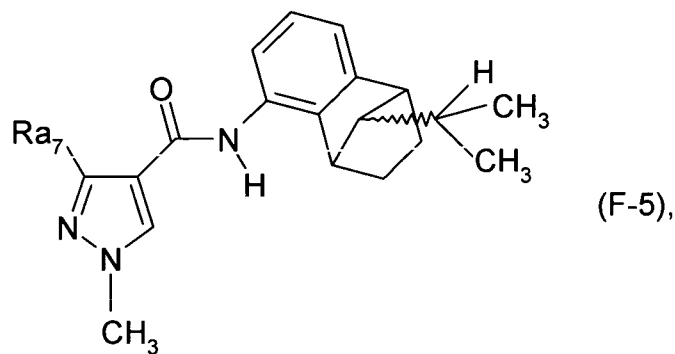
wherein Ra_6 is trifluoromethyl or difluoromethyl (WO2004/058723) + TX, the racemic compound of formula F-3 (syn)



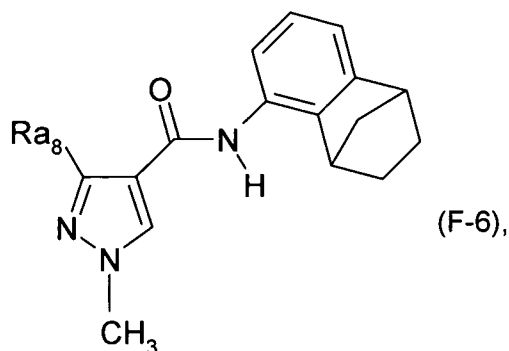
wherein Ra_7 is trifluoromethyl or difluoromethyl (WO2004/035589) + TX, the racemic mixture of formula F-4 (anti)



wherein Ra_7 is trifluoromethyl or difluoromethyl (WO2004/035589) + TX, the compound of formula F-5

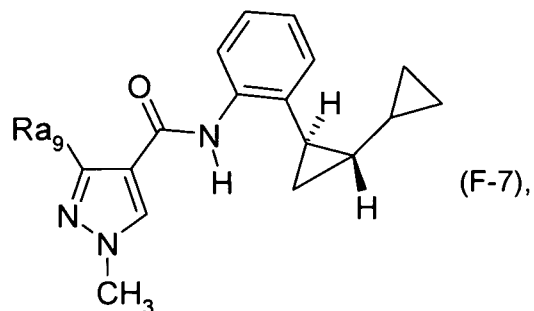


which is an epimeric mixture of racemic compounds of formulae F-3 (syn) and F-4 (anti), wherein the ratio from racemic compounds of formula F-3 (syn) to racemic compounds of formula F-4 (anti) is from 1000 : 1 to 1 : 1000 and wherein Ra_7 is trifluoromethyl or difluoromethyl (WO2004/035589) + TX, the compound of formula F-6

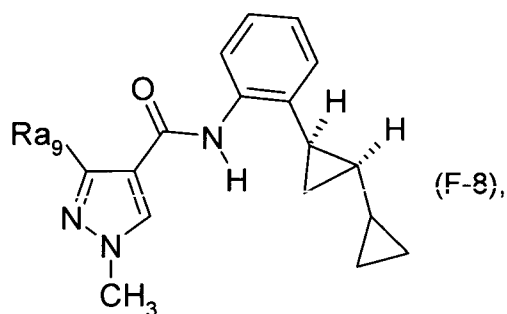


wherein Ra_8 is trifluoromethyl or difluoromethyl (WO2004/035589) + TX, the racemic compound of formula F-7 (trans)

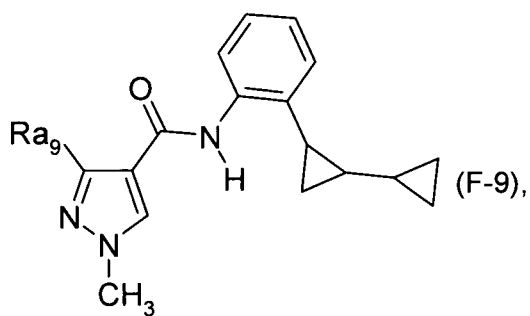
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wherein Ra_9 is trifluoromethyl or difluoromethyl (WO03/074491) + TX, the racemic compound of formula F-8 (cis)

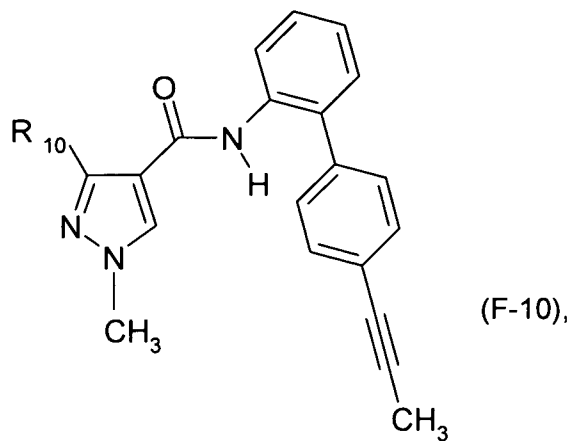


wherein Ra_9 is trifluoromethyl or difluoromethyl (WO03/074491) + TX, the compound of formula F-9

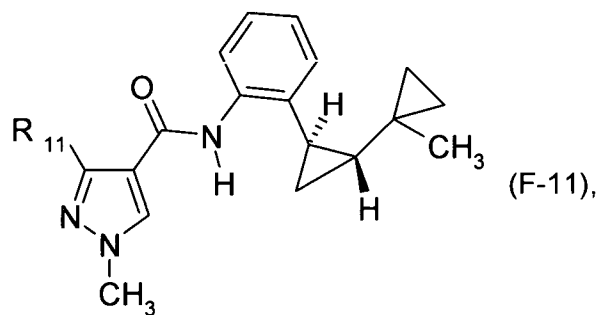


which is a mixture of the racemic compounds of formulae F-7 (trans) and F-8 (cis), wherein the ratio of the racemic compound of formula F-7 (trans) to the racemic compound of formula F-8 (cis) is 2 : 1 to 100 : 1 ; and wherein Ra_9 is trifluoromethyl or difluoromethyl (WO03/074491) + TX, the compound of formula F-10

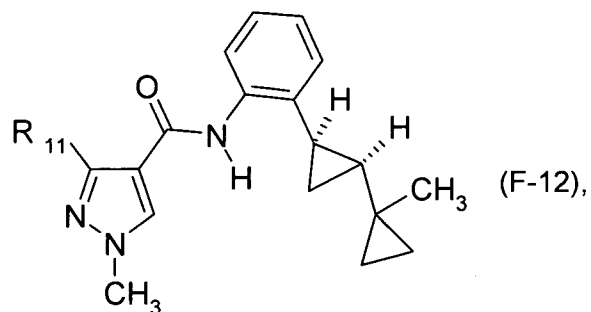
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wherein R_{10} is trifluoromethyl or difluoromethyl (WO2004/058723) + TX, the racemic compound of formula F-11 (trans)

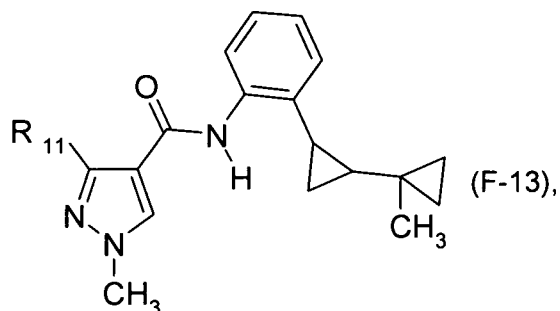


wherein R_{11} is trifluoromethyl or difluoromethyl (WO03/074491) + TX, the racemic compound of formula F-12 (cis)

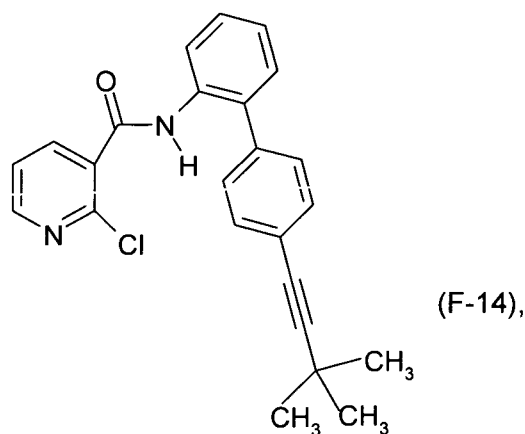


wherein R_{11} is trifluoromethyl or difluoromethyl (WO03/074491) + TX, the compound of formula F-13

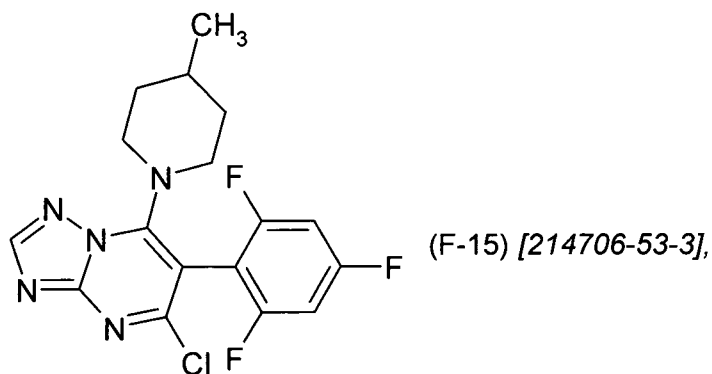
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which is a racemic mixture of formulae F-11 (trans) and F-12 (cis), and wherein R₁₁ is trifluoromethyl or difluoromethyl (WO 03/074491) + TX, the compound of formula F-14



(WO2004/058723) + TX, and the compound of formula F-15



+ TX.

The references in brackets behind the active ingredients, e.g. [3878-19-1] refer to the Chemical Abstracts Registry number. The compounds of the formulae A-1 to A-26 are described in WO 03/015518 or in WO 04/067528. The above described mixing partners are known. Where the active ingredients are included in "The Pesticide Manual" [The Pesticide Manual - A World Compendium; Thirteenth Edition; Editor: C. D. S. Tomlin; The British Crop

Protection Council], they are described therein under the entry number given in round brackets hereinabove for the particular compound; for example, the compound "abamectin" is described under entry number (1). Where "[CCN]" is added hereinabove to the particular compound, the compound in question is included in the "Compendium of Pesticide Common Names", which is accessible on the internet [A. Wood; Compendium of Pesticide Common Names, Copyright © 1995-2004]; for example, the compound "acetoprole" is described under the internet address <http://www.alanwood.net/pesticides/acetoprole.html>.

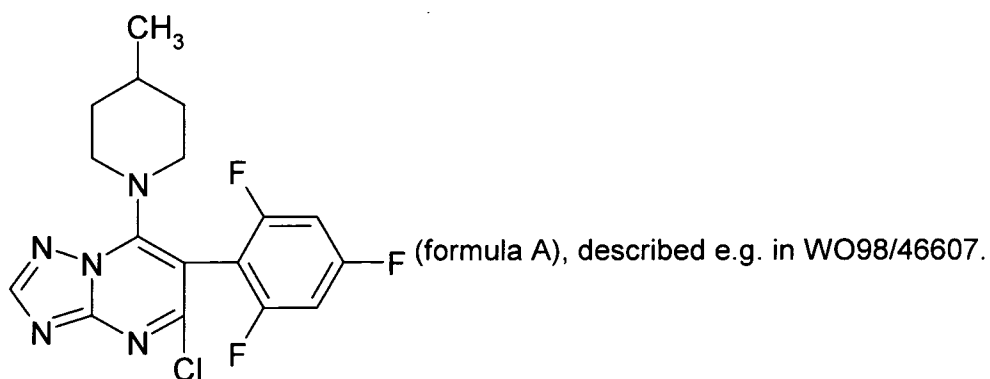
Most of the active ingredients described above are referred to hereinabove by a so-called "common name", the relevant "ISO common name" or another "common name" being used in individual cases. If the designation is not a "common name", the nature of the designation used instead is given in round brackets for the particular compound; in that case, the IUPAC name, the IUPAC/Chemical Abstracts name, a "chemical name", a "traditional name", a "compound name" or a "development code" is used or, if neither one of those designations nor a "common name" is used, an "alternative name" is employed. "CAS Reg. No" means the Chemical Abstracts Registry Number.

The active ingredient mixture of the compounds of formula I selected from Table 1 with active ingredients described above comprises a compound selected from Table 1 and an active ingredient as described above preferably in a mixing ratio of from 100:1 to 1:6000, especially from 50:1 to 1:50, more especially in a ratio of from 20:1 to 1:20, even more especially from 10:1 to 1:10, very especially from 5:1 and 1:5, special preference being given to a ratio of from 2:1 to 1:2, and a ratio of from 4:1 to 2:1 being likewise preferred, above all in a ratio of 1:1, or 5:1, or 5:2, or 5:3, or 5:4, or 4:1, or 4:2, or 4:3, or 3:1, or 3:2, or 2:1, or 1:5, or 2:5, or 3:5, or 4:5, or 1:4, or 2:4, or 3:4, or 1:3, or 2:3, or 1:2, or 1:600, or 1:300, or 1:150, or 1:35, or 2:35, or 4:35, or 1:75, or 2:75, or 4:75, or 1:6000, or 1:3000, or 1:1500, or 1:350, or 2:350, or 4:350, or 1:750, or 2:750, or 4:750. Those mixing ratios are understood to include, on the one hand, ratios by weight and also, on other hand, molar ratios.

The mixtures comprising a compound of formula I selected from Table 1 and one or more active ingredients as described above can be applied, for example, in a single "ready-mix" form, in a combined spray mixture composed from separate formulations of the single active ingredient components, such as a "tank-mix", and in a combined use of the single active ingredients when applied in a sequential manner, i.e. one after the other with a reasonably

short period, such as a few hours or days. The order of applying the compounds of formula I selected from Table 1 and the active ingredients as described above is not essential for working the present invention.

Especially preferred comprise the compositions according to the present invention as additional insecticidal active ingredients compounds selected from the class of neonicotinoid insecticides. Preferred compounds from the class of neonicotinoid insecticides are thiamethoxam (792) (available commercially as HELIX® and CRUISER®), imidacloprid (458) (available commercially as GAUCHO®) clothianidine (165), thiacloprid (791), dinotefuran (271), nitenpyram (579) and acetamiprid (4). Said compounds are described under the entry number given in round brackets hereinabove in the "The Pesticide Manual" [The Pesticide Manual - A World Compendium; Thirteenth Edition; Editor: C. D. S. Tomlin; The British Crop Protection Council]. Further preferred mixing partners for the compounds of formula I are selected from the group consisting of paclobutrazol (Chemical Abstracts Registry number 76738-62-0), acibenzolar-S-methyl (Chemical Abstracts Registry number 126448-41-7), bixafen (Chemical Abstracts Registry number 581809-46-3), fluopyram (Chemical Abstracts Registry number 658066-35-4) and the formula A



Therefore, the present invention also relates to a method of controlling pests comprising treating the plant or its propagation material with an effective amount of a composition comprising as active ingredients

- a) a compound of formula I as mentioned above;
- b) at least one adjuvant component selected from
 - b1) an oil additive comprising an oil of vegetable or animal origin, a mineral oil, the alkylesters thereof or mixtures of these oils and oil derivatives;

b2) an adjuvant having the formula (II)



wherein R_6 is a C_{16} to C_{20} straight or branched chain alkyl or alkenyl group, R_7 is ethyl or isopropyl, n is from 8 to 30 and m is 0 or 1 and when R_7 is ethyl, R_8 is a C_1 to C_7 alkyl group and when R_7 is isopropyl, R_8 is hydrogen or a C_1 to C_7 alkyl group; and

b3) one or more completely esterified organic phosphates and/or phosphonates, or mixtures of said surface active components; and
c) at least one compound selected from the class of neonicotinoid insecticides.

The active ingredient mixture of the compounds of formula I with neonicotinoid insecticides described above comprises a compound of formula I and an neonicotinoid insecticide as described above preferably in a mixing ratio of from 100:1 to 1:6000, especially from 50:1 to 1:50, more especially in a ratio of from 20:1 to 1:20, even more especially from 10:1 to 1:10, very especially from 5:1 and 1:5, special preference being given to a ratio of from 2:1 to 1:2, and a ratio of from 4:1 to 2:1 being likewise preferred, above all in a ratio of 1:1, or 5:1, or 5:2, or 5:3, or 5:4, or 4:1, or 4:2, or 4:3, or 3:1, or 3:2, or 2:1, or 1:5, or 2:5, or 3:5, or 4:5, or 1:4, or 2:4, or 3:4, or 1:3, or 2:3, or 1:2, or 1:600, or 1:300, or 1:150, or 1:35, or 2:35, or 4:35, or 1:75, or 2:75, or 4:75, or 1:6000, or 1:3000, or 1:1500, or 1:350, or 2:350, or 4:350, or 1:750, or 2:750, or 4:750. Those mixing ratios are understood to include, on the one hand, ratios by weight and also, on other hand, molar ratios.

The mixtures comprising a compound of formula I and an neonicotinoid insecticide as described above can be applied, for example, in a single "ready-mix" form, in a combined spray mixture composed from separate formulations of the single active ingredient components, such as a "tank-mix", and in a combined use of the single active ingredients when applied in a sequential manner, i.e. one after the other with a reasonably short period, such as a few hours or days. The order of applying the compounds of formula I and the neonicotinoid insecticides as described above is not essential for working the present invention.

The compositions according to the invention are preventively and/or curatively valuable active ingredients in the field of pest control, even at low rates of application, which have a very

favorable biocidal spectrum and are well tolerated by warm-blooded species, fish and plants. The active ingredients according to the invention act against all or individual developmental stages of normally sensitive, but also resistant, animal pests, such as insects or representatives of the order Acarina. The insecticidal or acaricidal activity of the active ingredients according to the invention can manifest itself directly, i. e. in destruction of the pests, which takes place either immediately or only after some time has elapsed, for example during ecdysis, or indirectly, for example in a reduced oviposition and/or hatching rate, a good activity corresponding to a destruction rate (mortality) of at least 50 to 60%.

Examples of the abovementioned animal pests are:

from the order *Acarina*, for example,

Acarus siro, *Aceria sheldoni*, *Aculus schlechtendali*, *Amblyomma* spp., *Argas* spp., *Boophilus* spp., *Brevipalpus* spp., *Bryobia praetiosa*, *Calipitimerus* spp., *Chorioptes* spp., *Demanyssus gallinae*, *Eotetranychus carpini*, *Eriophyes* spp., *Hyalomma* spp., *Ixodes* spp., *Olygonychus pratensis*, *Ornithodoros* spp., *Panonychus* spp., *Phyllocoptruta oleivora*, *Polyphagotarsonemus latus*, *Psoroptes* spp., *Rhipicephalus* spp., *Rhizoglyphus* spp., *Sarcoptes* spp., *Tarsonemus* spp. and *Tetranychus* spp.;

from the order *Anoplura*, for example,

Haematopinus spp., *Linognathus* spp., *Pediculus* spp., *Pemphigus* spp. and *Phylloxera* spp.;

from the order *Coleoptera*, for example,

Agriotes spp., *Anthonomus* spp., *Atomaria linearis*, *Chaetocnema tibialis*, *Cosmopolites* spp., *Curculio* spp., *Dermestes* spp., *Diabrotica* spp., *Epilachna* spp., *Eremnus* spp., *Leptinotarsa decemlineata*, *Lissorhoptrus* spp., *Melolontha* spp., *Orycaephilus* spp., *Otiorhynchus* spp., *Phlyctinus* spp., *Popillia* spp., *Psylliodes* spp., *Rhizopertha* spp., *Scarabeidae*, *Sitophilus* spp., *Sitotroga* spp., *Tenebrio* spp., *Tribolium* spp. and *Trogoderma* spp.;

from the order *Diptera*, for example,

Aedes spp., *Antherigona soccata*, *Bibio hortulanus*, *Calliphora erythrocephala*, *Ceratitis* spp., *Chrysomyia* spp., *Culex* spp., *Cuterebra* spp., *Dacus* spp., *Drosophila melanogaster*, *Fannia* spp., *Gastrophilus* spp., *Glossina* spp., *Hypoderma* spp., *Hyppobosca* spp., *Liriomyza* spp., *Lucilia* spp., *Melanagromyza* spp., *Musca* spp., *Oestrus* spp., *Orseolia* spp., *Oscinella frit*, *Pegomyia hyoscyami*, *Phorbia* spp., *Rhagoletis pomonella*, *Sciara* spp., *Stomoxys* spp., *Tabanus* spp., *Tannia* spp. and *Tipula* spp.;

from the order *Heteroptera*, for example,

Cimex spp., Distantiella theobroma, Dysdercus spp., Euchistus spp., Eurygaster spp., Lep-
tocorisa spp., Nezara spp., Piesma spp., Rhodnius spp., Sahlbergella singularis, Scotino-
phara spp. and Triatoma spp.;

from the order *Homoptera*, for example,

Aleurothrixus floccosus, Aleyrodes brassicae, Aonidiella spp., Aphididae, Aphis spp., Aspi-
diotus spp., Bemisia tabaci, Ceroplaster spp., Chrysomphalus aonidium, Chrysomphalus
dictyospermi, Coccus hesperidum, Empoasca spp., Eriosoma larigerum, Erythroneura spp.,
Gascardia spp., Laodelphax spp., Lecanium corni, Lepidosaphes spp., Macrosiphus spp.,
Myzus spp., Nephotettix spp., Nilaparvata spp., Parlatoria spp., Pemphigus spp., Planococ-
cus spp., Pseudaulacaspis spp., Pseudococcus spp., Psylla spp., Pulvinaria aethiopica,
Quadraspidiotus spp., Rhopalosiphum spp., Saissetia spp., Scaphoideus spp., Schizaphis
spp., Sitobion spp., Trialeurodes vaporariorum, Trioza erytreae and Unaspis citri;

from the order *Hymenoptera*, for example,

Acromyrmex, Atta spp., Cephus spp., Diprion spp., Diprionidae, Gilpinia polytoma, Hoplo-
campa spp., Lasius spp., Monomorium pharaonis, Neodiprion spp., Solenopsis spp. and
Vespa spp.;

from the order *Isoptera*, for example,

Reticulitermes spp.;

from the order *Lepidoptera*, for example,

Acleris spp., Adoxophyes spp., Aegeria spp., Agrotis spp., Alabama argillaceae, Amylois
spp., Anticarsia gemmatilis, Archips spp., Argyrotaenia spp., Autographa spp., Busseola
fusca, Cadra cautella, Carposina nipponensis, Chilo spp., Choristoneura spp., Clysia ambi-
guella, Cnaphalocrocis spp., Cnephasia spp., Cochylis spp., Coleophora spp., Crocidolomia
binotalis, Cryptophlebia leucotreta, Cydia spp., Diatraea spp., Diparopsis castanea, Earias
spp., Ephestia spp., Eucosma spp., Eupoecilia ambiguella, Euproctis spp., Euxoa spp., Gra-
pholita spp., Hedya nubiferana, Heliothis spp., Hellula undalis, Hyphantria cunea, Keiferia
lycopersicella, Leucoptera scitella, Lithocollethis spp., Lobesia botrana, Lymantria spp., Ly-
onetia spp., Malacosoma spp., Mamestra brassicae, Manduca sexta, Operophtera spp.,
Ostrinia nubilalis, Pammene spp., Pandemis spp., Panolis flammea, Pectinophora gossypi-
ela, Phthorimaea operculella, Pieris rapae, Pieris spp., Plutella xylostella, Prays spp., Scir-
pophaga spp., Sesamia spp., Sparganothis spp., Spodoptera spp., Synanthedon spp.,
Thaumetopoea spp., Tortrix spp., Trichoplusia ni and Yponomeuta spp.;

from the order *Mallophaga*, for example,

Damalinea spp. and Trichodectes spp.;

from the order *Orthoptera*, for example,

Blatta spp., *Blattella* spp., *Gryllotalpa* spp., *Leucophaea maderae*, *Locusta* spp., *Periplaneta* spp. and *Schistocerca* spp.;

from the order *Psocoptera*, for example,

Liposcelis spp.;

from the order *Siphonaptera*, for example,

Ceratophyllus spp., *Ctenocephalides* spp. and *Xenopsylla cheopis*;

from the order *Thysanoptera*, for example,

Frankliniella spp., *Hercinothrips* spp., *Scirtothrips aurantii*, *Taeniothrips* spp., *Thrips palmi* and *Thrips tabaci*; and

from the order *Thysanura*, for example,

Lepisma saccharina.

The compositions according to the invention can be used for controlling, i. e. containing or destroying, pests of the abovementioned type which occur in particular on plants, especially on useful plants and ornamentals in agriculture, in horticulture and in forests, or on organs, such as fruits, flowers, foliage or stalks of such plants.

Suitable target crops are, in particular, cereals, such as wheat, barley, rye, oats, rice, maize or sorghum; beet, such as sugar or fodder beet; fruit, for example pomaceous fruit, stone fruit or soft fruit, such as apples, pears, plums, peaches, almonds, cherries or berries, for example strawberries, raspberries or blackberries; leguminous crops, such as beans, lentils, peas or soya; oil crops, such as oilseed rape, mustard, poppies, olives, sunflowers, coconut, castor, cocoa or ground nuts; cucurbits, such as pumpkins, cucumbers or melons; fibre plants, such as cotton, flax, hemp or jute; citrus fruit, such as oranges, lemons, grapefruit or tangerines; vegetables, such as spinach, lettuce, asparagus, cabbages, carrots, onions, tomatoes, potatoes or bell peppers; Lauraceae, such as avocado, Cinnamomum or camphor; and also tobacco, nuts, coffee, eggplants, sugarcane, tea, pepper, grapevines, hops, the plantain family, latex plants and ornamentals.

The compositions according to the invention are especially suitable for controlling *Aphis craccivora*, *Diabrotica balteata*, *Heliothis virescens*, *Myzus persicae*, *Plutella xylostella* and *Spodoptera littoralis* in cotton, vegetable, maize, rice and soya crops. The compositions according to the invention are further especially suitable for controlling *Mamestra* (preferably

in vegetables), *Cydia pomonella* (preferably in apples), *Empoasca* (preferably in vegetables, vineyards), *Leptinotarsa* (preferably in potatoes) and *Chilo suppressalis* (preferably in rice).

The term "crops" is to be understood as including also crops that have been rendered tolerant to herbicides like bromoxynil or classes of herbicides (such as, for example, HPPD inhibitors, ALS inhibitors, for example primisulfuron, prosulfuron and trifloxysulfuron, EPSPS (5-enol-pyrovyl-shikimate-3-phosphate-synthase) inhibitors, GS (glutamine synthetase) inhibitors) as a result of conventional methods of breeding or genetic engineering. An example of a crop that has been rendered tolerant to imidazolinones, e.g. imazamox, by conventional methods of breeding (mutagenesis) is Clearfield® summer rape (Canola). Examples of crops that have been rendered tolerant to herbicides or classes of herbicides by genetic engineering methods include glyphosate- and glufosinate-resistant maize varieties commercially available under the trade names RoundupReady® and LibertyLink®.

The term "crops" is to be understood as including also crop plants which have been so transformed by the use of recombinant DNA techniques that they are capable of synthesising one or more selectively acting toxins, such as are known, for example, from toxin-producing bacteria, especially those of the genus *Bacillus*.

Toxins that can be expressed by such transgenic plants include, for example, insecticidal proteins, for example insecticidal proteins from *Bacillus cereus* or *Bacillus popilliae*; or insecticidal proteins from *Bacillus thuringiensis*, such as δ -endotoxins, e.g. CryIA(b), CryIA(c), CryIF, CryIF(a2), CryIIA(b), CryIIIA, CryIIIB(b1) or Cry9c, or vegetative insecticidal proteins (VIP), e.g. VIP1, VIP2, VIP3 or VIP3A; or insecticidal proteins of bacteria colonising nematodes, for example *Photorhabdus* spp. or *Xenorhabdus* spp., such as *Photorhabdus luminescens*, *Xenorhabdus nematophilus*; toxins produced by animals, such as scorpion toxins, arachnid toxins, wasp toxins and other insect-specific neurotoxins; toxins produced by fungi, such as *Streptomyces* toxins, plant lectins, such as pea lectins, barley lectins or snowdrop lectins; agglutinins; proteinase inhibitors, such as trypsin inhibitors, serine protease inhibitors, patatin, cystatin, papain inhibitors; ribosome-inactivating proteins (RIP), such as ricin, maize-RIP, abrin, luffin, saporin or bryodin; steroid metabolism enzymes, such as 3-hydroxysteroidoxidase, ecdysteroid-UDP-glycosyl-transferase, cholesterol oxidases, ecdysone inhibitors, HMG-CoA-reductase, ion channel blockers, such as blockers of sodium

or calcium channels, juvenile hormone esterase, diuretic hormone receptors, stilbene synthase, bibenzyl synthase, chitinases and glucanases.

In the context of the present invention there are to be understood by δ -endotoxins, for example CryIA(b), CryIA(c), CryIF, CryIF(a2), CryIIA(b), CryIIIA, CryIIIB(b1) or Cry9c, or vegetative insecticidal proteins (VIP), for example VIP1, VIP2, VIP3 or VIP3A, expressly also hybrid toxins, truncated toxins and modified toxins. Hybrid toxins are produced recombinantly by a new combination of different domains of those proteins (see, for example, WO 02/15701). Truncated toxins, for example a truncated CryIA(b), are known. In the case of modified toxins, one or more amino acids of the naturally occurring toxin are replaced. In such amino acid replacements, preferably non-naturally present protease recognition sequences are inserted into the toxin, such as, for example, in the case of CryIIIA055, a cathepsin-D-recognition sequence is inserted into a CryIIIA toxin (see WO 03/018810).

Examples of such toxins or transgenic plants capable of synthesising such toxins are disclosed, for example, in EP-A-0 374 753, WO 93/07278, WO 95/34656, EP-A-0 427 529, EP-A-451 878 and WO 03/052073.

The processes for the preparation of such transgenic plants are generally known to the person skilled in the art and are described, for example, in the publications mentioned above. CryI-type deoxyribonucleic acids and their preparation are known, for example, from WO 95/34656, EP-A-0 367 474, EP-A-0 401 979 and WO 90/13651.

The toxin contained in the transgenic plants imparts to the plants tolerance to harmful insects. Such insects can occur in any taxonomic group of insects, but are especially commonly found in the beetles (Coleoptera), two-winged insects (Diptera) and butterflies (Lepidoptera).

Transgenic plants containing one or more genes that code for an insecticidal resistance and express one or more toxins are known and some of them are commercially available.

Examples of such plants are: YieldGard® (maize variety that expresses a CryIA(b) toxin); YieldGard Rootworm® (maize variety that expresses a CryIIIB(b1) toxin); YieldGard Plus® (maize variety that expresses a CryIA(b) and a CryIIIB(b1) toxin); Starlink® (maize variety that expresses a Cry9(c) toxin); Herculex I® (maize variety that expresses a CryIF(a2) toxin)

and the enzyme phosphinothricine N-acetyltransferase (PAT) to achieve tolerance to the herbicide glufosinate ammonium); NuCOTN 33B® (cotton variety that expresses a CryIA(c) toxin); Bollgard I® (cotton variety that expresses a CryIA(c) toxin); Bollgard II® (cotton variety that expresses a CryIA(c) and a CryIIA(b) toxin); VIPCOT® (cotton variety that expresses a VIP toxin); NewLeaf® (potato variety that expresses a CryIIIA toxin); Nature-Gard®, Agrisure® GT Advantage (GA21 glyphosate-tolerant trait), Agrisure® CB Advantage (Bt11 corn borer (CB) trait) and Protecta®.

Transgenic crops of insect-resistant plants are also described in BATS (Zentrum für Biosicherheit und Nachhaltigkeit, Zentrum BATS, Clarastrasse 13, 4058 Basel, Switzerland) Report 2003, (<http://bats.ch>).

The term "crops" is to be understood as including also crop plants which have been so transformed by the use of recombinant DNA techniques that they are capable of synthesising antipathogenic substances having a selective action, such as, for example, the so-called "pathogenesis-related proteins" (PRPs, see e.g. EP-A-0 392 225). Examples of such antipathogenic substances and transgenic plants capable of synthesising such antipathogenic substances are known, for example, from EP-A-0 392 225, WO 95/33818 and EP-A-0 353 191. The methods of producing such transgenic plants are generally known to the person skilled in the art and are described, for example, in the publications mentioned above.

Antipathogenic substances which can be expressed by such transgenic plants include, for example, ion channel blockers, such as blockers for sodium and calcium channels, for example the viral KP1, KP4 or KP6 toxins; stilbene synthases; bibenzyl synthases; chitinases; glucanases; the so-called "pathogenesis-related proteins" (PRPs; see e.g. EP-A-0 392 225); antipathogenic substances produced by microorganisms, for example peptide antibiotics or heterocyclic antibiotics (see e.g. WO 95/33818) or protein or polypeptide factors involved in plant pathogen defence (so-called "plant disease resistance genes", as described in WO 03/000906).

Biological Examples:

Example B1: Translaminar test method (Activity against *Aphis craccivora*)

Bush bean plants (*Phaseolus vulgaris* var. Autan) were cut to 2 leaves. Plants were treated with compounds and the following day aphids were placed on the lower leaf side. On Bush beans *Aphis craccivora* were placed within a glue ring to prevent them from moving from the lower leaf side. Bush beans were kept in the growth chamber at a temperature of $20\pm 1^{\circ}\text{C}$, 50-65% relative humidity, and 16 hours light. The application rates are 100, 50 and 25 ppm active substance. Assessment was conducted 7 days after application. Number of live aphids was counted and then converted to % mortality. Mortalities corrected using Abbott's formula. The results are given in Table B1.

Example B2: Feeding contact test method (*Aphis craccivora* on broad beans and *Myzus persicae* on pea seedlings).

Rates 25, 12.5, 6 ppm active substance

Insects: *Myzus persicae* (mix population)

Aphis craccivora (mixed population)

Plants: Pea seedlings - *Pisum sativum* few day old emerging seedlings

Broad beans - *Vicia faba* var. 12 day old

Application: Turn-table sprayer 50ml volume equivalent to 600l/ha

Pea seedlings or Bush beans were infested with *A. craccivora* or *M. persicae* respectively. Plants were treated with samples. Plants were kept in the growth chamber at a temperature of $20\pm 1^{\circ}\text{C}$, 50-65% relative humidity, and 16 hours light.

Evaluations: Assessment was conducted 3 or 6 days after application. The number of live aphids was counted and then converted to % mortality. Mortalities corrected using Abbott's formula. The results are given in Table B2 and B3.

The active ingredients of formula I are formulated as suspension concentrates (SC). The adjuvant b) is then tank-mixed with the SC formulations.

Identity of the ingredients of the suspension concentrate used in the Examples:

Active ingredient	10%
Soprophor 3D33	2%
Sodium Lignosulfonate	0.5%
Atlox 4913	1%
Silicon Emulsion	0.5%

Propylene Glycol	2.5%
Water	rest

Soprophor 3D33 is a tristyril-phenol-phosphates-polyethoxylated with 17 Ethoxylates made by Rhodia). Atlox 4913 is polymethyl methacrylate-polyethylene glycol graft copolymer.

The following adjuvants b) are used:

mineral oil

sunflower oil

ADIGOR® (contains 48.8% methylated rape seed oil and 28.2 % ethoxylated alcohols), manufactured by Syngenta Crop Protection Canada, Inc..

CET Speed (contains 4.9% oleyl-polyglycolether with ethylene oxide (non-ionic surfactant) in form of GENAPOL® O-100, 14.7% oleyl-ppolyglycolether with ethylene oxide (non-ionic surfactant) in form of GENAPOL® O-120, 14.7% DL-propanediol(1,2) in form of 1,2-propylene glycol and rest water).

Agnique®FOH (compound of formula II, endcapped surfactant), manufactured by Cognis AgroSolution.

TEHP (tris-(2ethylhexyl)phosphate)

Tween®80

(percentages in %w/w.)

Oil 1: mineral oil

Oil 2: sunflower oil

Table B1: insecticidal action in % mortality of a compound of formula I, wherein R₁ is isopropyl, R₂ is methoxy; R₃ is methyl, R₄ is hydrogen and X is X₈ ; against *Aphis craccivora*:

Adjuvant (concentration) /application rate	25ppm	50ppm	100ppm
none	9	23	40
Oil 1 (0.1 %)	68	97	99
Oil 2 (0.1%)	80	93	100
Agnique (0.4%)	100	100	100
TEHP (0.1%)	98	100	100
Tween (0.1%)	100	100	100

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Adjuvant (concentration) /application rate	25ppm	50ppm	100ppm
Adigor (0.1%)	99	100	100
CET Speed (0.4%)	100	100	100

Table B2: insecticidal action in % mortality of a compound of formula I, wherein R₁ is isopropyl, R₂ is methoxy; R₃ is methyl, R₄ is hydrogen and X is X₈ ; against *Aphis craccivora*:

Adjuvant (concentration) /application rate	6ppm	12ppm	25ppm
none	35	50	52
Oil 1 (0.1 %)	75	93	99
Oil 2 (0.1%)	93	96	99
TEHP (0.1%)	80	97	100
Adigor (0.1%)	66	98	99
CET Speed (0.4%)	78	99	100

Table B3: insecticidal action in % mortality of a compound of formula I, wherein R₁ is isopropyl, R₂ is methoxy; R₃ is methyl, R₄ is hydrogen and X is X₈ ; against *Aphis craccivora*:

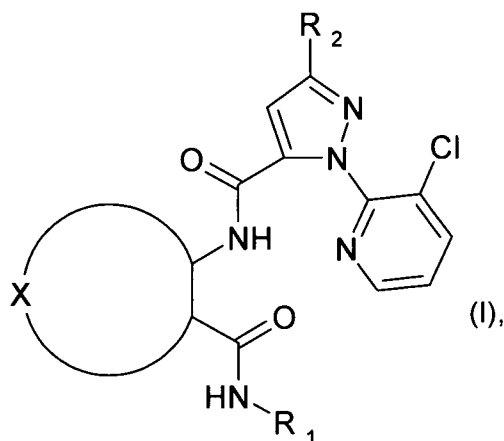
Adjuvant (concentration) /application rate	6ppm	12ppm	25ppm
none	26	28	29
Oil 1 (0.1 %)	97	99	99
TEHP (0.1%)	99	100	100
Adigor (0.1%)	99	100	100
CET Speed (0.4%)	97	100	100

In the tests described above, mortality with the single adjuvants components alone was observed always to be below 10%.

What is claimed is:

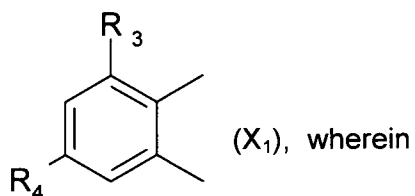
1. A pesticidal composition comprising

a) a compound of formula I



wherein

X is a bivalent group



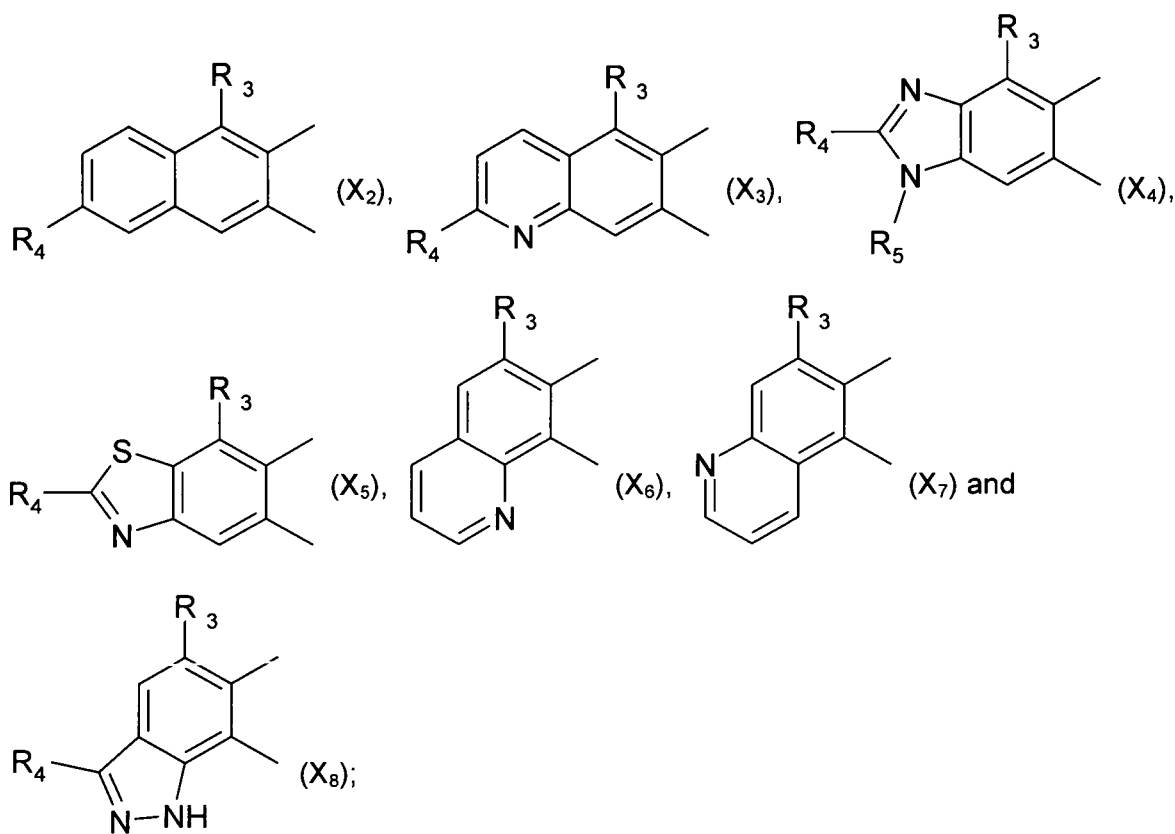
R₁ is C₃-C₆cycloalkyl substituted by C₃-C₆cycloalkyl;

R₂ is halogen, C₁-C₄alkoxy, C₁-C₄haloalkyl or C₁-C₄haloalkoxy;

R₃ is C₁-C₄alkyl or halogen; and

R₄ is hydrogen, C₁-C₄alkyl, C₁-C₄alkoxy, cyano, nitro or halogen;

or X is a bivalent group selected from



wherein R₁ is hydrogen, C₁-C₄alkyl or C₁-C₄alkyl substituted with one or two groups selected from C₃-C₆cycloalkyl and cyano; or R₁ is C₃-C₆cycloalkyl or C₃-C₆cycloalkyl substituted by C₃-C₆cycloalkyl;

R₂ is halogen, C₁-C₄alkoxy, C₁-C₄haloalkyl or C₁-C₄haloalkoxy;

R₃ is C₁-C₄alkyl or halogen; and

R₄ and R₅ independently from each other, are hydrogen, C₁-C₄alkyl, C₁-C₄alkoxy, cyano, nitro, or halogen; and agronomically acceptable salts/isomers/enantiomers/tautomers/N-oxides of those compounds and

b) at least one adjuvant component selected from

b1) an oil additive comprising an oil of vegetable or animal origin, a mineral oil, the alkylesters thereof or mixtures of these oils and oil derivatives;

b2) an adjuvant having the formula (II)



wherein R_6 is a C_{16} to C_{20} straight or branched chain alkyl or alkenyl group, R_7 is ethyl or isopropyl, n is from 8 to 30 and m is 0 or 1 and when R_7 is ethyl, R_8 is a C_1 to C_7 alkyl group and when R_7 is isopropyl, R_8 is hydrogen or a C_1 to C_7 alkyl group; and
b3) one or more completely esterified organic phosphates and/or phosphonates, or mixtures of said adjuvant components.

2. A composition according to claim 1, wherein the oil additive b1) is selected from mineral oil, sunflower oil or methylated rape seed oil.

3. A composition according to claim 1, wherein the surface active component b) is an adjuvant b2).

4. A composition according to claim 1, wherein the surface active component b) is an adjuvant b3).

5. A composition according to claim 1, which comprises a compound of formula I wherein

a) R_1 is cyclopropyl substituted by cyclopropyl at the 1-position, R_2 is bromine, R_3 is methyl, R_4 is CN and X is X_1 ;

b) R_1 is cyclopropyl substituted by cyclopropyl at the 1-position, R_2 is CF_3 , R_3 is methyl, R_4 is Cl and X is X_1 ;

c) R_1 is cyclopropyl substituted by cyclopropyl at the 1-position, R_2 is CF_3 , R_3 is methyl, R_4 is CN and X is X_1 ;

d) R_1 is cyclopropyl substituted by cyclopropyl at the 1-position, R_2 is OCH_2CF_3 , R_3 is methyl, R_4 is CN and X is X_1 ;

e) R_1 is methyl, R_2 is CF_3 , R_3 is chlorine, R_4 is chlorine and X is X_2 ;

f) R_1 is isopropyl, R_2 is CF_3 , R_3 is chlorine, R_4 is chlorine and X is X_2 ;

g) R_1 is methyl, R_2 is bromine, R_3 is chlorine, R_4 is chlorine and X is X_2 ;

h) R_1 is methyl, R_2 is CF_3 , R_3 is methyl, R_4 is chlorine and X is X_2 ;

i) R_1 is isopropyl, R_2 is CF_3 , R_3 is methyl, R_4 is chlorine and X is X_2 ;

j) R_1 is methyl, R_2 is bromine, R_3 is methyl, R_4 is chlorine and X is X_2 ;

k) R_1 is methyl, R_2 is CF_3 , R_3 is methyl, R_4 is methyl and X is X_3 ;

l) R_1 is isopropyl, R_2 is CF_3 , R_3 is chlorine, R_4 is hydrogen and X is X_8 ;

m) R_1 is methyl, R_2 is CF_3 , R_3 is chlorine, R_4 is hydrogen and X is X_8 ;

n) R_1 is isopropyl, R_2 is methoxy; R_3 is methyl, R_4 is hydrogen and X is X_8 ;

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- n) R₁ is methyl, R₂ is methoxy; R₃ is methyl, R₄ is hydrogen and X is X₈ ;
- n) R₁ is isopropyl, R₂ is CF₃, R₃ is methyl, R₄ is hydrogen and X is X₈;
- o) R₁ is isopropyl, R₂ is Br, R₃ is methyl, R₄ is hydrogen and X is X₈;
- p) R₁ is isopropyl, R₂ is Br, R₃ is chlorine, R₄ is hydrogen and X is X₈;
- q) R₁ is isopropyl, R₂ is methoxy, R₃ is chlorine, R₄ is hydrogen and X is X₈;

6. A composition according to claim 5, wherein R₁ is isopropyl, R₂ is methoxy; R₃ is methyl, R₄ is hydrogen and X is X₈ .

7. A composition according to claim 1 for controlling insects or representatives of the order Acarina.

8. A method for controlling pests, which comprises applying a composition according to claim 1 to the pests or their environment.

9. A method according to claim 8 for controlling insects or representatives of the order Acarina.