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(54) Titre : ASSOCIATIONS DE PRINCIPES ACTIFS PRESENTANT DES PROPRIETES INSECTICIDES ET ACARICIDES
(54) Title: ACTIVE SUBSTANCE COMBINATIONS WITH INSECTICIDE AND ACARICIDE PROPERTIES

(57) **Abrégé/Abstract:**

The novel active ingredient combinations which consist of the compounds of the formula (I) in combination with further active insecticidal ingredients (II) are very suitable for control of animal pests such as insects and / or unwanted acarids.

Active ingredient combinations having insecticidal and acaricidal properties

A b s t r a c t

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- 1 -

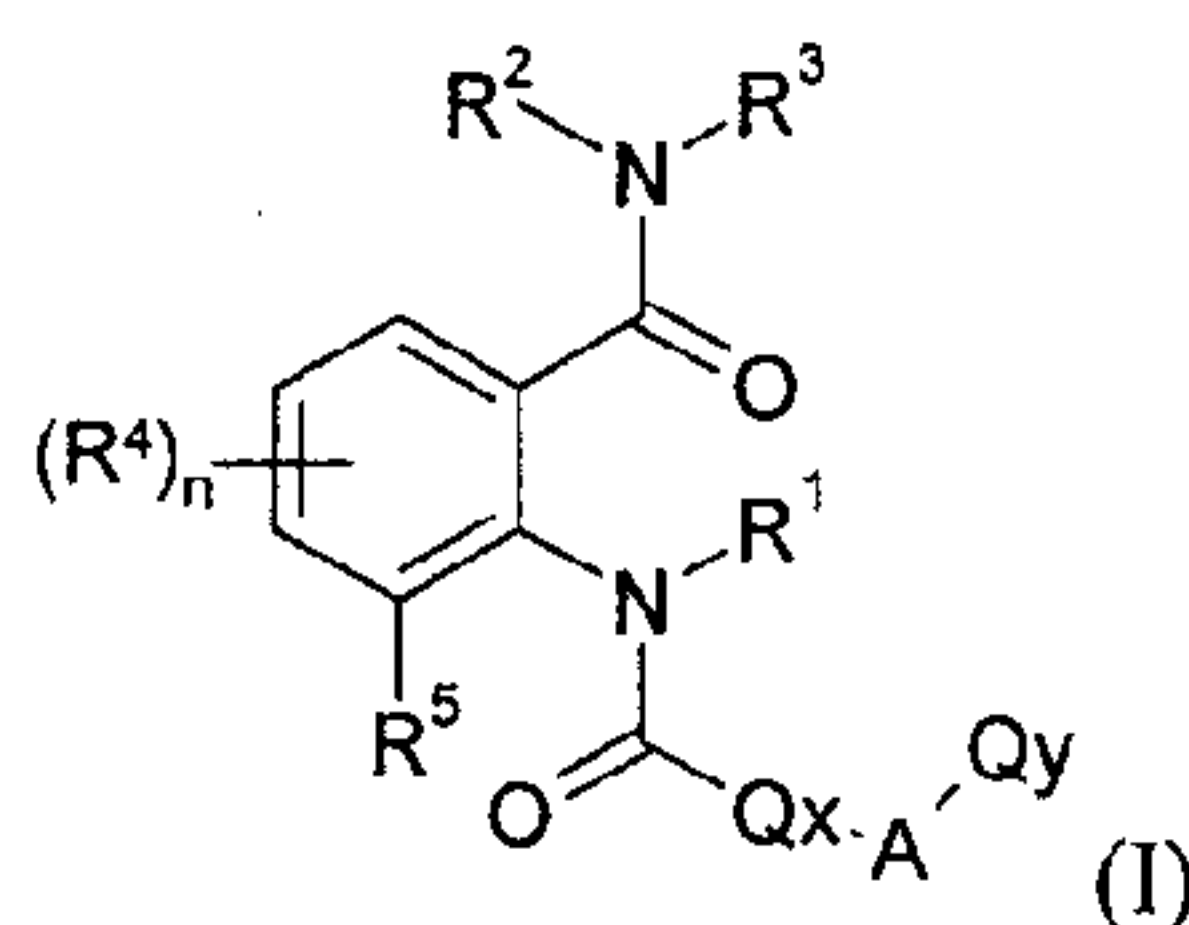
ACTIVE SUBSTANCE COMBINATIONS WITH INSECTICIDE AND ACARICIDE PROPERTIES

The present invention relates to novel active ingredient combinations which consist of the compounds of the formula (I) in combination with further active insecticidal ingredients (II) and are very suitable for control of animal pests such as insects and / or unwanted acarids.

- 5 Some of the compounds of the formula (I) are known from WO 2007/144100 and their insecticidal action has been described. The active ingredients specified in this description by their common name are known, for example, from "The Pesticide Manual" 14th ed., British Crop Protection Council 2006, and the website <http://www.alanwood.net/pesticides>.

10 However, the acaricidal and/or insecticidal efficacy and/or the activity spectrum and/or the compatibility of the known compounds with plants, especially with respect to crop plants, is not always adequate.

It has now been found that active ingredient combinations comprising the compounds of the general formula (I)



15 in which

- R^1 is hydrogen, amino, hydroxyl or in each case optionally C_1 - C_6 -alkyl, C_2 - C_6 -alkenyl, C_2 - C_6 -alkynyl or C_3 - C_6 -cycloalkyl, where the substituents may each independently be selected from halogen, cyano, nitro, hydroxyl, C_1 - C_4 -alkoxy, C_1 - C_4 -alkylthio, C_1 - C_4 -alkylsulphinyl, C_1 - C_4 -alkylsulphonyl, (C_1 - C_4 -alkoxy)carbonyl, C_1 - C_4 -alkylamino, di-(C_1 - C_4 -alkyl)amino, C_3 - C_6 -cycloalkylamino or (C_1 - C_4 -alkyl) C_3 - C_6 -cycloalkylamino,
- 20 R^2 is hydrogen, C_1 - C_6 -alkyl, C_2 - C_6 -alkenyl, C_2 - C_6 -alkynyl, C_3 - C_6 -cycloalkyl, C_1 - C_4 -alkoxy, C_1 - C_4 -alkylamino, di-(C_1 - C_4 -alkyl)amino, C_3 - C_6 -cycloalkylamino, C_1 - C_6 -alkoxycarbonyl or C_1 - C_6 -alkylcarbonyl,
- 25 R^3 is hydrogen or in each case optionally mono- or polysubstituted identically or differently, C_1 - C_6 -alkyl, C_1 - C_6 -alkoxy, C_2 - C_6 -alkenyl, C_2 - C_6 -alkynyl, C_3 - C_{12} -cycloalkyl, C_3 - C_{12} -cycloalkyl- C_1 - C_6 -alkyl, where the substituents may each independently be selected from amino, C_3 - C_6 -cycloalkylamino, halogen, cyano, carboxyl, carbamoyl, nitro, hydroxyl, C_1 - C_6 -alkyl, C_1 - C_6 -

haloalkyl, C₃-C₆-cycloalkyl, C₁-C₄-alkoxy, C₁-C₄-haloalkoxy, C₁-C₄-alkylthio, C₁-C₄-alkylsulphinyl, C₁-C₄-alkylsulphonyl, C₁-C₆-alkoxycarbonyl, C₁-C₆-alkylcarbonyl, C₃-C₆-trialkylsilyl or a saturated or partly saturated heterocyclic ring, an aromatic or heteroaromatic ring or a saturated, partly saturated or aromatic heterobicyclic ring, where the ring or ring system is optionally mono- or polysubstituted identically or differently by SF₅, halogen, cyano, nitro, hydroxyl, amino, carboxyl, carbamoyl, aminosulphonyl, C₁-C₆-alkyl, C₃-C₆-cycloalkyl, C₁-C₄-alkoxy, C₁-C₆-haloalkyl, C₁-C₄-haloalkoxy, C₁-C₄-alkylthio, C₁-C₄-alkylsulphinyl, C₁-C₄-alkylsulphonyl, C₁-C₄-alkylsulphimino, C₁-C₄-alkylsulphimino-C₁-C₄-alkyl, C₁-C₄-alkylsulphimino-C₂-C₅-alkylcarbonyl, C₁-C₄-alkylsulphoximino, C₁-C₄-alkylsulphoximino-C₁-C₄-alkyl, C₁-C₄-alkylsulphoximino-C₂-C₅-alkylcarbonyl, C₁-C₆-alkoxycarbonyl, C₁-C₆-alkylcarbonyl, C₃-C₆-trialkylsilyl, benzyl C₂-C₆-alkenyl, C₂-C₆-alkynyl, C₂-C₆-haloalkenyl, C₂-C₆-haloalkynyl, C₃-C₆-halocycloalkyl, C₁-C₄-haloalkylthio, C₁-C₄-haloalkylsulphinyl, C₁-C₄-haloalkylsulphonyl, C₁-C₄-alkylamino, di-(C₁-C₄-alkyl)amino, C₃-C₆-cycloalkylamino, or a 3- to 6-membered ring, where the ring may optionally be substituted by C₁-C₆-alkyl, halogen, cyano, nitro, halo(C₁-C₆)-alkyl, C₁-C₆-alkoxy or halo(C₁-C₆)-alkoxy, or

R³ is C₁-C₆-alkoxycarbonyl, C₁-C₆-alkylcarbonyl, C₁-C₆-alkylaminocarbonyl or di(C₁-C₆)alkylaminocarbonyl, or

R³ is additionally a mono- or polysubstituted identically or differently, 5- or 6-membered aromatic or heteroaromatic ring, a 4, 5- or 6-membered partly saturated ring or saturated heterocyclic ring, or a saturated, partly saturated or aromatic heterobicyclic ring which may optionally contain one to three heteroatoms from the group of O, S and N, where the substituents are each independently selected from SF₅, halogen, cyano, nitro, hydroxyl, amino, carboxyl, carbamoyl, C₁-C₆-alkyl, C₃-C₆-cycloalkyl, C₁-C₄-alkoxy, C₁-C₆-haloalkyl, C₁-C₄-haloalkoxy, C₁-C₄-alkylthio, C₁-C₄-alkylsulphinyl, C₁-C₄-alkylsulphonyl, C₁-C₄-alkylsulphimino, C₁-C₄-alkylsulphimino-C₁-C₄-alkyl, C₁-C₄-alkylsulphimino-C₁-C₅-alkylcarbonyl, C₁-C₄-alkylsulphoximino, C₁-C₄-alkylsulphoximino-C₁-C₄-alkyl, C₁-C₄-alkylsulphoximino-C₂-C₅-alkylcarbonyl, C₁-C₆-alkoxycarbonyl, C₁-C₆-alkylcarbonyl, C₃-C₆-trialkylsilyl, C₂-C₆-alkenyl, C₂-C₆-alkynyl, C₂-C₆-haloalkenyl, C₂-C₆-haloalkynyl, C₃-C₆-halocycloalkyl, C₁-C₄-haloalkylthio, C₁-C₄-haloalkylsulphinyl, C₁-C₄-haloalkylsulphonyl, C₁-C₄-alkylamino, di-(C₁-C₄-alkyl)amino, C₃-C₆-cycloalkylamino, or a 3- to 6-membered ring, where the ring may optionally be substituted by C₁-C₆-alkyl, halogen, cyano, nitro, halo(C₁-C₆)-alkyl, C₁-C₆-alkoxy or halo(C₁-C₆)-alkoxy,

R² and R³ may be joined to one another via two to six carbon atoms and form a ring which optionally additionally contains a further nitrogen, sulphur or oxygen atom and may optionally be mono- to tetrasubstituted by C₁-C₂-alkyl, C₁-C₂-haloalkyl, halogen, cyano, amino C₁-C₂-alkoxy or C₁-C₂-

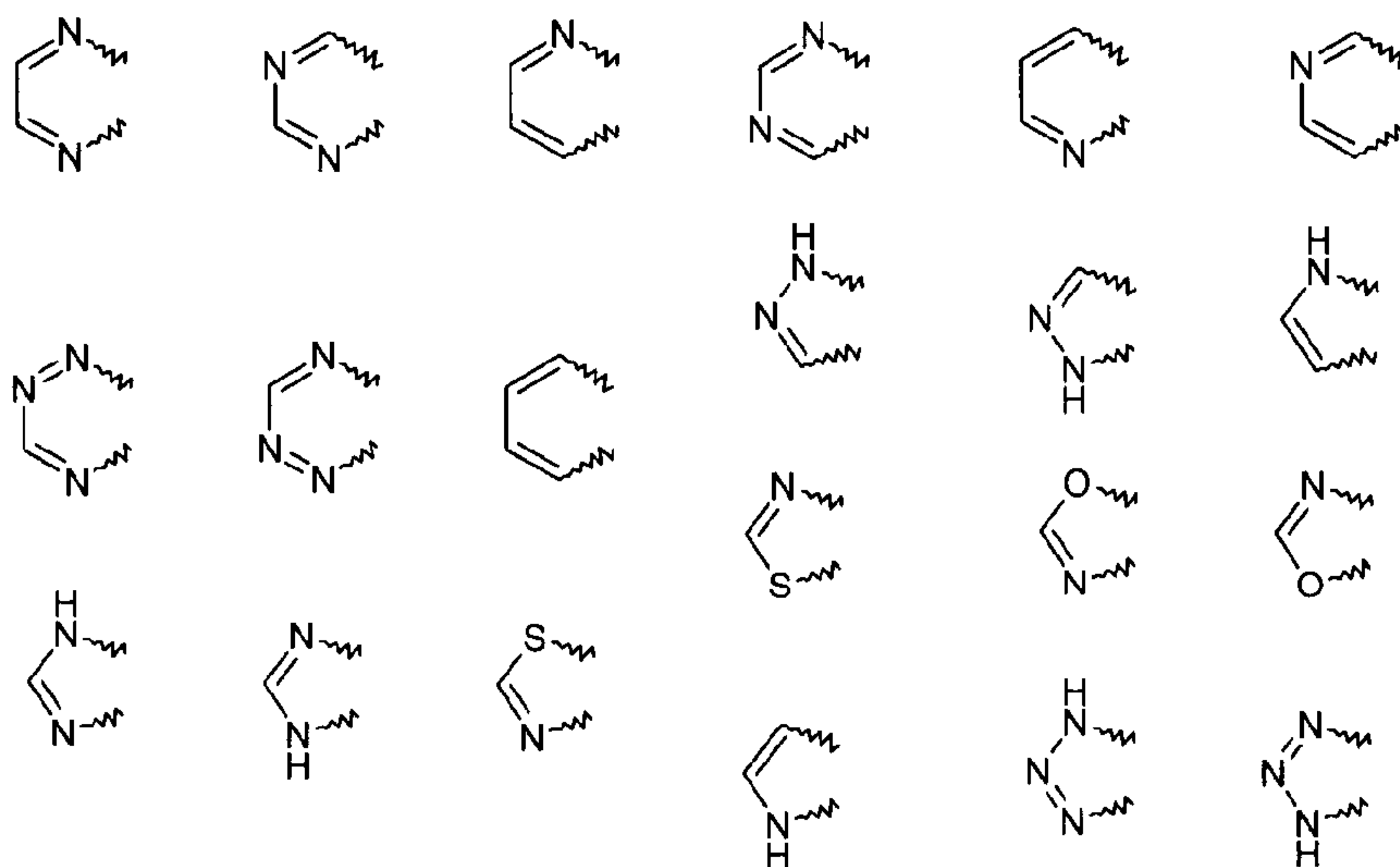
haloalkoxy,

R^2, R^3 together are additionally $=S(C_1-C_4\text{-alkyl})_2, =S(O)(C_1-C_4\text{-alkyl})_2$,

R^4 is hydrogen, halogen, cyano, nitro $C_1-C_4\text{-alkyl}$, $C_1-C_4\text{-haloalkyl}$, $C_2-C_6\text{-alkenyl}$, $C_2-C_6\text{-haloalkenyl}$, $C_2-C_6\text{-alkynyl}$, $C_1-C_4\text{-alkoxy}$, $C_1-C_4\text{-haloalkoxy}$, SF_5 , $C_1-C_4\text{-alkylthio}$, $C_1-C_4\text{-alkylsulphinyl}$, $C_1-C_4\text{-alkylsulphonyl}$, $C_1-C_4\text{-haloalkylthio}$, $C_1-C_4\text{-haloalkylsulphinyl}$, $C_1-C_4\text{-haloalkylsulphonyl}$, $C_1-C_4\text{-alkylamino}$, di- $(C_1-C_4\text{-alkyl})\text{amino}$, $C_3-C_6\text{-cycloalkylamino}$, $(C_1-C_4\text{-alkoxy})\text{imino}$, $(C_1-C_4\text{-alkyl})(C_1-C_4\text{-alkoxy})\text{imino}$, $(C_1-C_4\text{-haloalkyl})(C_1-C_4\text{-alkoxy})\text{imino}$ or $C_3-C_6\text{-trialkylsilyl}$, or

two R^4 via adjacent carbon atoms form a ring which is $-(CH_2)_3-$, $-(CH_2)_4-$, $-(CH_2)_5-$, $-(CH=CH)_2-$, $-OCH_2O-$, $-O(CH_2)_2O-$, $-OCF_2O-$, $-(CF_2)_2O-$, $-O(CF_2)_2O-$, $-(CH=CH-CH=N)-$ or $-(CH=CH-N=CH)-$,

two R^4 via adjacent carbon atoms additionally form the following fused rings which are optionally mono- or polysubstituted identically or differently, where the substituents may each independently be selected from hydrogen, $C_1-C_6\text{-alkyl}$, $C_3-C_6\text{-cycloalkyl}$, $C_1-C_6\text{-haloalkyl}$, $C_3-C_6\text{-halocycloalkyl}$, halogen, $C_1-C_6\text{-alkoxy}$, $C_1-C_4\text{-alkylthio}(C_1-C_6\text{-alkyl})$, $C_1-C_4\text{-alkylsulphinyl}(C_1-C_6\text{-alkyl})$, $C_1-C_4\text{-alkylsulphonyl}(C_1-C_6\text{-alkyl})$, $C_1-C_4\text{-alkylamino}$, di- $(C_1-C_4\text{-alkyl})\text{amino}$ or $C_3-C_6\text{-cycloalkylamino}$,



15

n is 0 to 3,

R^5 is $C_1-C_6\text{-alkyl}$, $C_3-C_6\text{-cycloalkyl}$, $C_1-C_6\text{-haloalkyl}$, $C_1-C_6\text{-halocycloalkyl}$, $C_2-C_6\text{-alkenyl}$, $C_2-C_6\text{-haloalkenyl}$, $C_2-C_6\text{-alkynyl}$, $C_2-C_6\text{-haloalkynyl}$, $C_1-C_4\text{-alkoxy}$, $C_1-C_4\text{-haloalkoxy}$, $C_1-C_4\text{-alkylthio}$, $C_1-C_4\text{-alkylsulphinyl}$, $C_1-C_4\text{-alkylsulphonyl}$, $C_1-C_4\text{-haloalkylthio}$, $C_1-C_4\text{-haloalkylsulphinyl}$, $C_1-C_4\text{-haloalkylsulphonyl}$, halogen, cyano, nitro or $C_3-C_6\text{-trialkylsilyl}$,

20

Q_x is an optionally singly or multiply, identically or differently R^7 -substituted, aromatic or

heteroaromatic 5- to 6-membered ring which may contain 1-3 heteroatoms from the group of N, S, O,

A is optionally mono- or polysubstituted $-(C_1-C_6\text{-alkylene})-$, $-(C_2-C_6\text{-alkenylene})-$, $-(C_2-C_6\text{-alkynylene})-$, $-R^8-(C_3-C_6\text{-cycloalkyl})-R^8-$, $-R^8-O-R^8-$, $-R^8-S-R^8-$, $-R^8-S(=O)-R^8-$, $-R^8-S(=O)_2-R^8-$, $-R^8-N(C_1-C_6\text{-alkyl})-R^8-$, $-R^8-C=NO(C_1-C_6\text{-alkyl})-R^8$, $-CH[CO_2(C_1-C_6\text{-alkyl})]$, $-R^8-C(=O)-R^8$, $-R^8-C(=O)NH-R^8$, $R^8-C(=O)N(C_1-C_6\text{-alkyl})-R^8$, $-R^8-C(=O)NHNH-R^8-$, $-R^8-C(=O)N(C_1-C_6\text{-alkyl})-NH-R^8-$, $-R^8-C(=O)NHN(C_1-C_6\text{-alkyl})-R^8$, $-R^8-O(C=O)-R^8$, $-R^8-O(C=O)NH-R^8$, $-R^8-O(C=O)N(C_1-C_6\text{-alkyl})-R^8$, $-R^8-S(=O)_2NH-R^8$, $-R^8-S(=O)_2N(C_1-C_6\text{-alkyl})-R^8$, $-R^8-S(C=O)-R^8$, $-R^8-S(C=O)NH-R^8$, $-R^8-S(C=O)N(C_1-C_6\text{-alkyl})-R^8$, $-R^8-NHNH-R^8$, $-R^8-NHN(C_1-C_6\text{-alkyl})-R^8$, $-R^8-N(C_1-C_6\text{-alkyl})-NH-R^8$, $-R^8-N(C_1-C_6\text{-alkyl})-N(C_1-C_6\text{-alkyl})-R^8$, $-R^8-N=CH-O-R^8$, $-R^8-NH(C=O)O-R^8$, $-R^8-N(C_1-C_6\text{-alkyl})-(C=O)O-R^8$, $-R^8-NH(C=O)NH-R^8$, $-R^8-NH(C=S)NH-R^8$, $-R^8-NHS(=O)_2-R^8$, R^8-NH-R^8 , $R^8-C(=O)-C(=O)-R^8$, $R^8-C(OH)-R^8$, $R^8-NH(C=O)-R^8$, R^8-Qz-R^8 , $R^8-C(=N-NR'_2)-R^8$, $R^8-C(=C-R'_2)-R^8$ or $-R^8-N(C_1-C_6\text{-alkyl})S(=O)_2-R^8$,

where the substituents may each independently be selected from halogen, cyano, nitro, hydroxyl, C_1-C_6 -alkyl, C_1-C_6 -alkoxy, halogen- C_1-C_6 -alkyl, amino, $(C_1-C_6\text{-alkyl})$ amino, $di(C_1-C_6\text{-alkyl})$ amino, C_3-C_6 -cycloalkyl

where $-(C_3-C_6\text{-cycloalkyl})-$ in the ring may optionally contain 1 to 2 heteroatoms selected from the group of N, S, O,

R^8 is linear or branched $-(C_1-C_6\text{-alkylene})-$ or a direct bond,

where two or more R^8 are independently linear or branched $-(C_1-C_6\text{-alkylene})-$ or a direct bond,

for example R^8-O-R^8- is $-(C_1-C_6\text{-alkylene})-O-(C_1-C_6\text{-alkylene})-$, $-(C_1-C_6\text{-alkylene})-O-$, $-O-(C_1-C_6\text{-alkylene})-$, or $-O-$,

where R' is alkyl, alkylcarbonyl, alkenyl, alkynyl, which may optionally be mono- or poly-halogen-substituted,

Qz is a 3- to 4-membered, partly saturated or saturated, or a 5- to 6-membered, partly saturated, saturated or aromatic ring or a 6- to 10-membered bicyclic ring system,

where the ring or bicyclic ring system may optionally contain 1-3 heteroatoms from the group of N, S, O,

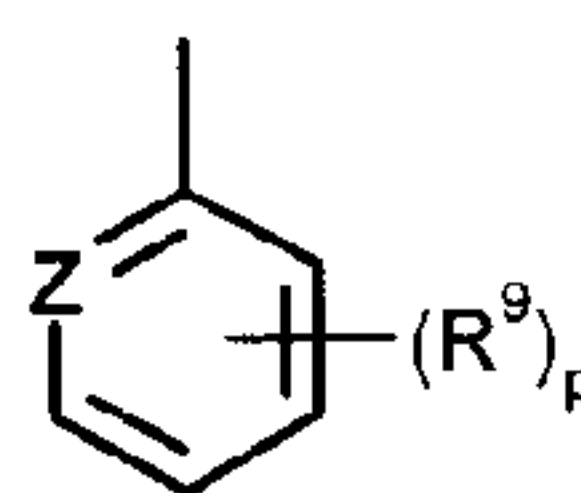
where the ring or bicyclic ring system is optionally mono- or polysubstituted identically or differently, and where the substituents may each independently be selected from hydrogen, C_1-C_6 -alkyl, C_2-C_6 -

alkenyl, C₂-C₆-alkynyl, C₃-C₆-cycloalkyl, C₁-C₆-haloalkyl, C₂-C₆-haloalkenyl, C₂-C₆-haloalkynyl, C₃-C₆-halocycloalkyl, halogen, cyano, carbamoyl, nitro, hydroxyl, C₁-C₄-alkoxy, C₁-C₄-haloalkoxy, C₁-C₄-alkylthio, C₁-C₄-alkylsulphinyl, C₁-C₄-alkylsulphonyl, C₁-C₄-haloalkylthio, C₁-C₄-haloalkylsulphinyl, C₁-C₄-haloalkylsulphonyl, C₁-C₄-alkylamino, di-(C₁-C₄-alkyl)amino, C₃-C₆-cycloalkylamino, (C₁-C₆-alkyl)carbonyl, (C₁-C₆-alkoxy)carbonyl, (C₁-C₆-alkyl)aminocarbonyl, di-(C₁-C₄-alkyl)aminocarbonyl,

Q_Y is a 5- or 6-membered, partly saturated or saturated heterocyclic or heteroaromatic ring or an aromatic 8-, 9- or 10-membered fused heterobicyclic ring system, where the ring or ring system is optionally mono- or polysubstituted, identically or differently, and where the substituents may each independently be selected from hydrogen, C₁-C₆-alkyl, C₂-C₆-alkenyl, C₂-C₆-alkynyl, C₃-C₆-cycloalkyl, C₁-C₆-haloalkyl, C₂-C₆-haloalkenyl, C₂-C₆-haloalkynyl, C₃-C₆-halocycloalkyl, halogen, cyano, carboxyl, carbamoyl, nitro, hydroxyl, C₁-C₄-alkoxy, C₁-C₄-haloalkoxy, C₁-C₄-alkylthio, C₁-C₄-alkylsulphinyl, C₁-C₄-alkylsulphonyl, C₁-C₄-haloalkylthio, C₁-C₄-haloalkylsulphinyl, C₁-C₄-haloalkylsulphonyl, C₁-C₄-alkylamino, di-(C₁-C₄-alkyl)amino, C₃-C₆-cycloalkylamino, (C₁-C₆-alkyl)carbonyl, (C₁-C₆-alkoxy)carbonyl, (C₁-C₆-alkyl)aminocarbonyl, di-(C₁-C₄-alkyl)aminocarbonyl, tri-(C₁-C₂)alkylsilyl, (C₁-C₄-alkyl)(C₁-C₄-alkoxy)imino,

or where the substituents may each independently be selected from phenyl or a 5- or 6-membered heteroaromatic ring, where phenyl or the ring may optionally be mono- or polysubstituted identically or differently by C₁-C₆-alkyl, C₂-C₆-alkenyl, C₂-C₆-alkynyl, C₃-C₆-cycloalkyl, C₁-C₆-haloalkyl, C₂-C₆-haloalkenyl, C₂-C₆-haloalkynyl, C₃-C₆-halocycloalkyl, halogen, cyano, nitro, hydroxyl, C₁-C₄-alkoxy, C₁-C₄-haloalkoxy,

R⁷ is hydrogen, C₁-C₆-alkyl, C₂-C₆-alkenyl, C₂-C₆-alkynyl, C₃-C₆-cycloalkyl, C₁-C₆-haloalkyl, C₂-C₆-haloalkenyl, C₃-C₆-cycloalkoxy or



R⁹ is independently hydrogen, C₁-C₆-alkyl, C₃-C₆-cycloalkyl, C₁-C₆-haloalkyl, halogen, cyano, nitro, C₁-C₄-alkoxy, C₁-C₄-haloalkoxy, C₁-C₄-alkylthio or C₁-C₄-haloalkylthio,

p is 0 to 4,

Z is N, CH, CF, CCl, CBr or Cl,

the compounds of the general formula (I) also including N-oxides and salts (I),

and one or more further insecticides and / or acaricides from the group (II):

(1) Acetylcholinesterase (AChE) inhibitors, for example

- carbamates, for example alanycarb, aldicarb, bendiocarb, benfuracarb, butocarboxim, butoxycarboxim,
 5 carbaryl, carbofuran, carbosulfan, ethiofencarb, fenobucarb, formetanate, furathiocarb, isoprocarb,
 methiocarb, methomyl, metolcarb, oxamyl, pirimicarb, propoxur, thiodicarb, thiofanox, triazamate,
 trimethacarb, XMC and xylylcarb; or
 organophosphates, for example acephate, azamethiphos, azinphos (-methyl, -ethyl), cadusafos,
 chlorethoxyfos, chlorfenvinphos, chlormephos, chlorpyrifos (-methyl), coumaphos, cyanophos,
 10 demeton-S-methyl, diazinon, dichlorvos/DDVP, dicrotophos, dimethoate, dimethylvinphos, disulfoton,
 EPN, ethion, ethoprophos, famphur, fenamiphos, fenitrothion, fenthion, fosthiazate, heptenophos,
 isofenphos, isopropyl *O*-(methoxyaminothiophosphoryl)salicylate, isoxathion, malathion, mecarbam,
 methamidophos, methidathion, mevinphos, monocrotophos, naled, omethoate, oxydemeton-methyl,
 parathion (-methyl), phenthoate, phorate, phosalone, phosmet, phosphamidon, phoxim, pirimiphos (-
 15 methyl), profenofos, propetamphos, prothiofos, pyraclofos, pyridaphenthion, quinalphos, sulfotep,
 tebupirimfos, temephos, terbufos, tetrachlorvinphos, thiometon, triazophos, trichlorfon and vamidothion.

(2) GABA-gated chloride channel antagonists, for example

organochlorines, for example chlordane and endosulfan (alpha-); or
 fiproles (phenylpyrazoles), for example ethiprole, fipronil, pyrafluprole and pyriprole.

20 (3) Sodium channel modulators/voltage-dependent sodium channel blockers, for example

- pyrethroids, for example acrinathrin, allethrin (d-cis-trans, d-trans), bifenthrin, bioallethrin, bioallethrin-
 S-cyclopentenyl, bioresmethrin, cycloprothrin, cyfluthrin (beta-), cyhalothrin (gamma-, lambda-),
 cypermethrin (alpha-, beta-, theta-, zeta-), cyphenothrin [(1*R*)-*trans*-isomers], deltamethrin,
 dimefluthrin, empenthrin [(*EZ*)-(1*R*)-isomers], esfenvalerate, etofenprox, fenpropathrin, fenvalerate,
 25 flucythrinate, flumethrin, fluvalinate (tau-), halfenprox, imiprothrin, metofluthrin, permethrin,
 phenothrin [(1*R*)-*trans*-isomer], prallethrin, profluthrin, pyrethrins (pyrethrum), resmethrin, RU 15525,
 silafluofen, tefluthrin, tetramethrin [(1*R*)-isomers], tralomethrin, transfluthrin and ZXI 8901; or
 DDT; or methoxychlor.

(4) Nicotinergeric acetylcholine receptor agonists, for example

- 30 neonicotinoids, for example acetamiprid, clothianidin, dinotefuran, imidacloprid, nitenpyram,
 thiacloprid, thiamethoxam; or
 nicotine.

(5) Allosteric acetylcholine receptor modulators (agonists), for example

spinosyns, for example spinetoram and spinosad.

35 (6) chloride channel activators, for example

- avermectins/milbemycins, for example abamectin, emamectin benzoate, lepimectin and milbemectin.
- (7) Juvenile hormone analogues, for example hydroprene, kinoprene, methoprene; or fenoxycarb; pyriproxyfen.
- (8) Active ingredients with unknown or nonspecific mechanisms of action, for example
- 5 fumigants, for example methyl bromide and other alkyl halides; or chloropicrin; sulphuryl fluoride; borax; tartar emetic.
- (9) Selective antifeedants, for example pymetrozine; or flonicamid.
- (10) mite growth inhibitors, for example clofentezine, diflovidazin, hexythiazox, etoxazole.
- (11) microbial disruptors of the insect gut membrane, for example *Bacillus thuringiensis* subspecies
- 10 *israelensis*, *Bacillus sphaericus*, *Bacillus thuringiensis* subspecies *aizawai*, *Bacillus thuringiensis* subspecies *kurstaki*, *Bacillus thuringiensis* subspecies *tenebrionis*, and BT plant proteins, for example Cry1Ab, Cry1Ac, Cry1Fa, Cry2Ab, mCry3A, Cry3Ab, Cry3Bb, Cry34/35Ab1.
- (12) Oxidative phosphorylation inhibitors, ATP disruptors, for example diafenthiuron; or organotin compounds, for example azocyclotin, cyhexatin, fenbutatin oxide; or
- 15 propargite; tetradifon.
- (13) Oxidative phosphorylation decouplers acting by interrupting the H⁺ proton gradient, for example chlorfenapyr and DNOC.
- (14) Nicotinic acetylcholine receptor antagonists, for example bensultap, cartap (hydrochloride), thiocylam, and thiosultap (sodium).
- 20 (15) Chitin biosynthesis inhibitors, type 0, for example benzoylureas, for example bistrifluron, chlorfluazuron, diflubenzuron, flucycloxuron, flufenoxuron, hexaflumuron, lufenuron, novaluron, noviflumuron, teflubenzuron and triflumuron.
- (16) Chitin biosynthesis inhibitors, type 1, for example buprofezin.
- (17) Moulting disruptors, for example cyromazine.
- 25 (18) Ecdysone agonists/disruptors, for example diacylhydrazines, for example chromafenozide, halofenozide, methoxyfenozide and tebufenozide.
- (19) Octopaminergic agonists, for example amitraz.
- (20) Complex-III electron transport inhibitors, for example hydramethylnone; acequinocyl; fluacrypyrim.
- 30 (21) Complex-I electron transport inhibitors, for example from the group of the METI acaricides, for example fenazaquin, fenpyroximate, pyrimidifen, pyridaben, tebufenpyrad, tolfenpyrad; or rotenone (Derris).
- (22) Voltage-dependent sodium channel blockers, for example indoxacarb; metaflumizone.
- (23) Inhibitors of acetyl-CoA carboxylase, for example tetronic acid derivatives, for example
- 35 spirodiclofen and spiromesifen; or tetramic acid derivatives, for example spirotetramat.
- (24) Complex-IV electron transport inhibitors, for example phosphines, for example aluminium

phosphide, calcium phosphide, phosphine, zinc phosphide; or cyanide.

(25) Complex-II electron transport inhibitors, for example cyenopyrafen.

(28) Ryanodine receptor effectors, for example

diamides, for example chlorantraniliprole and flubendiamide.

- 5 Further active ingredients with unknown mechanism of action, for example amidoflumet, azadirachtin, benclonthiaz, benzoximate, bifenazate, bromopropylate, chinomethionat, cryolite, cyantraniliprole (Cyazypyr), cyflumetofen, dicofol, diflovidazin, fluensulfone, flufenerim, flufiprole, fluopyram, fufenozide, imidaclothiz, imicyafos, iprodione, pyridalyl, pyrifluquinazon and iodomethane; and also preparations based on *Bacillus firmus* (I-1582, BioNeem, Votivo), further compounds such as
- 10 dichloropropene, oil (for example petroleum), metaldehyde, metam-sodium, and the following known active compounds:

- 3-bromo-N-{2-bromo-4-chloro-6-[(1-cyclopropylethyl)carbamoyl]phenyl}-1-(3-chloropyridin-2-yl)-1H-pyrazole-5-carboxamide (known from WO2005/077934), 4-{[(6-bromopyrid-3-yl)methyl](2-fluoroethyl)amino}furan-2(5H)-one (known from WO2007/115644), 4-{[(6-fluoropyrid-3-yl)methyl](2,2-difluoroethyl)amino}furan-2(5H)-one (known from WO2007/115644), 4-{[(2-chloro-1,3-thiazol-5-yl)methyl](2-fluoroethyl)amino}furan-2(5H)-one (known from WO2007/115644), 4-{[(6-chloropyrid-3-yl)methyl](2-fluoroethyl)amino}furan-2(5H)-one (known from WO2007/115644), 4-{[(6-chloropyrid-3-yl)methyl](2,2-difluoroethyl)amino}furan-2(5H)-one (known from WO2007/115644), 4-{[(6-chloro-5-fluoropyrid-3-yl)methyl](methyl)amino}furan-2(5H)-one (known from WO2007/115643),
- 20 4-{[(5,6-dichloropyrid-3-yl)methyl](2-fluoroethyl)amino}furan-2(5H)-one (known from WO2007/115646), 4-{[(6-chloro-5-fluoropyrid-3-yl)methyl](cyclopropyl)amino}furan-2(5H)-one (known from WO2007/115643), 4-{[(6-chloropyrid-3-yl)methyl](cyclopropyl)amino}furan-2(5H)-one (known from EP-A-0 539 588), 4-{[(6-chloropyrid-3-yl)methyl](methyl)amino}furan-2(5H)-one (known from EP-A-0 539 588), {[1-(6-chloropyridin-3-yl)ethyl](methyl)oxido- λ^4 -sulphanylidene}cyanamide (known from WO2007/149134) and its diastereomers {[1-(6-chloropyridin-3-yl)ethyl](methyl)oxido- λ^4 -sulphanylidene}cyanamide (A) and {[1-(6-chloropyridin-3-yl)ethyl](methyl)oxido- λ^4 -sulphanylidene}cyanamide (B) (likewise known from WO2007/149134) and sulfoxaflo (likewise known from WO2007/149134) and its diastereomers [(R)-methyl(oxido){(1R)-1-[6-(trifluoromethyl)pyridin-3-yl]ethyl}- λ^4 -sulphanylidene]cyanamide (A1) and
- 30 [(S)-methyl(oxido){(1S)-1-[6-(trifluoromethyl)pyridin-3-yl]ethyl}- λ^4 -sulphanylidene]cyanamide (A2), designated as diastereomer group A (known from WO 2010/074747, WO 2010/074751), [(R)-methyl(oxido){(1S)-1-[6-(trifluoromethyl)pyridin-3-yl]ethyl}- λ^4 -sulphanylidene]cyanamide (B1) and [(S)-methyl(oxido){(1R)-1-[6-(trifluoromethyl)pyridin-3-yl]ethyl}- λ^4 -sulphanylidene]cyanamide (B2), designated as diastereomer group B (likewise known from WO 2010/074747, WO 2010/074751), and
- 35 11-(4-chloro-2,6-dimethylphenyl)-12-hydroxy-1,4-dioxo-9-azadispiro[4.2.4.2]tetradec-11-en-10-one (known from WO2006/089633), 3-(4'-fluoro-2,4-dimethylbiphenyl-3-yl)-4-hydroxy-8-oxa-1-

azaspiro[4.5]dec-3-en-2-one (known from WO2008/067911), 1-{2-fluoro-4-methyl-5-[(2,2,2-trifluoroethyl)sulphinyl]phenyl}-3-(trifluoromethyl)-1H-1,2,4-triazol-5-amine (known from WO2006/043635), [(3S,4aR,12R,12aS,12bS)-3-[(cyclopropylcarbonyl)oxy]-6,12-dihydroxy-4,12b-dimethyl-11-oxo-9-(pyridin-3-yl)-1,3,4,4a,5,6,6a,12,12a,12b-decahydro-2H,11H-benzo[f]pyrano[4,3-b]chromen-4-yl]methyl cyclopropanecarboxylate (known from WO2008/066153), 2-cyano-3-(difluoromethoxy)-N,N-dimethylbenzenesulphonamide (known from WO2006/056433), 2-cyano-3-(difluoromethoxy)-N-methylbenzenesulphonamide (known from WO2006/100288), 2-cyano-3-(difluoromethoxy)-N-ethylbenzenesulphonamide (known from WO2005/035486), 4-(difluoromethoxy)-N-ethyl-N-methyl-1,2-benzothiazol-3-amine 1,1-dioxide (known from WO2007/057407), N-[1-(2,3-dimethylphenyl)-2-(3,5-dimethylphenyl)ethyl]-4,5-dihydro-1,3-thiazol-2-amine (known from WO2008/104503), {1'-[(2E)-3-(4-chlorophenyl)prop-2-en-1-yl]-5-fluorospiro[indole-3,4'-piperidin]-1(2H)-yl}(2-chloropyridin-4-yl)methanone (known from WO2003/106457), 3-(2,5-dimethylphenyl)-4-hydroxy-8-methoxy-1,8-diazaspiro[4.5]dec-3-en-2-one (known from WO2009/049851), 3-(2,5-dimethylphenyl)-8-methoxy-2-oxo-1,8-diazaspiro[4.5]dec-3-en-4-yl ethyl carbonate (known from WO2009/049851), 4-(but-2-yn-1-yloxy)-6-(3,5-dimethylpiperidin-1-yl)-5-fluoropyrimidine (known from WO2004/099160), (2,2,3,3,4,4,5,5-octafluoropentyl)(3,3,3-trifluoropropyl)malononitrile (known from WO2005/063094), (2,2,3,3,4,4,5,5-octafluoropentyl)(3,3,4,4,4-pentafluorobutyl)malononitrile (known from WO2005/063094), 8-[2-(cyclopropylmethoxy)-4-(trifluoromethyl)phenoxy]-3-[6-(trifluoromethyl)pyridazin-3-yl]-3-azabicyclo[3.2.1]octane (known from WO2007/040280), 2-ethyl-7-methoxy-3-methyl-6-[(2,2,3,3-tetrafluoro-2,3-dihydro-1,4-benzodioxin-6-yl)oxy]quinolin-4-yl methyl carbonate (known from JP2008/110953), 2-ethyl-7-methoxy-3-methyl-6-[(2,2,3,3-tetrafluoro-2,3-dihydro-1,4-benzodioxin-6-yl)oxy]quinolin-4-yl acetate (known from JP2008/110953), PF1364 (CAS Reg. No. 1204776-60-2) (known from JP2010/018586), 5-[5-(3,5-dichlorophenyl)-5-(trifluoromethyl)-4,5-dihydro-1,2-oxazol-3-yl]-2-(1H-1,2,4-triazol-1-yl)benzonitrile (known from WO2007/075459), 5-[5-(2-chloropyridin-4-yl)-5-(trifluoromethyl)-4,5-dihydro-1,2-oxazol-3-yl]-2-(1H-1,2,4-triazol-1-yl)benzonitrile (known from WO2007/075459), 4-[5-(3,5-dichlorophenyl)-5-(trifluoromethyl)-4,5-dihydro-1,2-oxazol-3-yl]-2-methyl-N-{2-oxo-2-[(2,2,2-trifluoroethyl)amino]ethyl}benzamide (known from WO2005/085216), 4-{[(6-chloropyridin-3-yl)methyl](cyclopropyl)amino}-1,3-oxazol-2(5H)-one, 4-{[(6-chloropyridin-3-yl)methyl](2,2-difluoroethyl)amino}-1,3-oxazol-2(5H)-one, 4-{[(6-chloropyridin-3-yl)methyl](ethyl)amino}-1,3-oxazol-2(5H)-one, 4-{[(6-chloropyridin-3-yl)methyl](methyl)amino}-1,3-oxazol-2(5H)-one (all known from WO2010/005692), NNI-0711 (known from WO2002096882), 1-acetyl-N-[4-(1,1,1,3,3,3-hexafluoro-2-methoxypropan-2-yl)-3-isobutylphenyl]-N-isobutyryl-3,5-dimethyl-1H-pyrazole-4-carboxamide (known from WO2002096882), methyl 2-[2-({[3-bromo-1-(3-chloropyridin-2-yl)-1H-pyrazol-5-yl]carbonyl}amino)-5-chloro-3-methylbenzoyl]-2-methylhydrazinecarboxylate (known from WO2005/085216), methyl 2-[2-({[3-bromo-1-(3-chloropyridin-2-yl)-1H-pyrazol-5-yl]carbonyl}amino)-5-cyano-3-methylbenzoyl]-2-

ethylhydrazinecarboxylate (known from WO2005/085216), methyl 2-[2-([3-bromo-1-(3-chloropyridin-2-yl)-1H-pyrazol-5-yl]carbonyl)amino)-5-cyano-3-methylbenzoyl]-2-methylhydrazinecarboxylate (known from WO2005/085216), methyl 2-[3,5-dibromo-2-([3-bromo-1-(3-chloropyridin-2-yl)-1H-pyrazol-5-yl]carbonyl)amino)benzoyl]-1,2-diethylhydrazinecarboxylate (known from WO2005/085216), methyl 2-[3,5-dibromo-2-([3-bromo-1-(3-chloropyridin-2-yl)-1H-pyrazol-5-yl]carbonyl)amino)benzoyl]-2-ethylhydrazinecarboxylate (known from WO2005/085216), (5RS,7RS;5RS,7SR)-1-(6-chloro-3-pyridylmethyl)-1,2,3,5,6,7-hexahydro-7-methyl-8-nitro-5-propoxyimidazo[1,2-a]pyridine (known from WO2007/101369), 2-{6-[2-(5-fluoropyridin-3-yl)-1,3-thiazol-5-yl]pyridin-2-yl}pyrimidine (known from WO2010/006713), 2-{6-[2-(pyridin-3-yl)-1,3-thiazol-5-yl]pyridin-2-yl}pyrimidine (known from WO2010/006713)

are very suitable for control of animal pests such as insects and/or acaricides. The active ingredients of group (II) are, in accordance with the IRAC classification, assigned to different classes and groups according to their mechanism of action.

If, within this description, the short form of the common name of an active ingredient is used, this in each case encompasses all common derivatives, such as the esters and salts, and isomers, especially optical isomers, especially the commercial form or forms. If an ester or salt is referred to by the common name, this also refers in each case to all other common derivatives, such as other esters and salts, the free acids and neutral compounds, and isomers, especially optical isomers, especially the commercial form or forms. The chemical compound names mentioned refer to at least one of the compounds encompassed by the common name, frequently a preferred compound.

Surprisingly, the insecticidal and/or acaricidal action of the inventive active ingredient combinations is much higher than the total of the actions of the individual active ingredients. There is an unforeseeable true synergistic effect and not just complementary action.

Preferred combinations comprise at least one of the active ingredients of the formula (I) specified as preferred, more preferred, even more preferred or especially preferred and one or more active ingredients selected from the group (II).

Preferred, more preferred, even more preferred or especially preferred are active ingredients of the formula (I) where

R¹ is preferably hydrogen, C₁-C₆-alkyl, C₂-C₆-alkenyl, C₂-C₆-alkynyl, C₃-C₆-cycloalkyl, cyano(C₁-C₆-alkyl), C₁-C₆-haloalkyl, C₂-C₆-haloalkenyl, C₂-C₆-haloalkynyl, C₁-C₄-alkoxy-C₁-C₄-alkyl, C₁-C₄-alkylthio-C₁-C₄-alkyl, C₁-C₄-alkylsulphinyl-C₁-C₄-alkyl or C₁-C₄-alkylsulphonyl-C₁-C₄-alkyl,

R¹ is more preferably hydrogen, methyl, ethyl, cyclopropyl, cyanomethyl, methoxymethyl,

methylthiomethyl, methylsulphinylmethyl or methylsulphonylmethyl,

R¹ is even more preferably hydrogen,

R² is preferably hydrogen or C₁-C₆-alkyl.

R² is more preferably hydrogen or methyl.

5 R² is even more preferably hydrogen.

R³ is preferably hydrogen or in each case optionally mono- or polysubstituted identically or differently, C₁-C₄-alkyl, C₁-C₄-alkoxy, C₂-C₄-alkenyl, C₂-C₄-alkynyl, C₃-C₆-cycloalkyl, where the substituents may each independently be selected from halogen, cyano, carboxyl, carbamoyl, nitro, hydroxyl, C₁-C₄-alkyl, C₁-C₄-haloalkyl, C₃-C₆-cycloalkyl, C₁-C₄-alkoxy, C₁-C₄-haloalkoxy, C₁-C₄-alkylthio, C₁-C₄-alkylsulphinyl, C₁-C₄-alkylsulphonyl, C₁-C₄-alkoxycarbonyl, C₁-C₄-alkylcarbonyl or a phenyl ring or a 4, 5- or 6-membered, aromatic partly saturated or saturated heterocyclic ring, where the phenyl ring or heterocyclic ring is optionally mono- or polysubstituted identically or differently, and where the substituents may each independently be selected from hydrogen, C₁-C₆-alkyl, C₂-C₆-alkenyl, C₂-C₆-alkynyl, C₃-C₆-cycloalkyl, C₁-C₆-haloalkyl, C₂-C₆-haloalkenyl, C₂-C₆-haloalkynyl, C₃-C₆-halocycloalkyl, halogen, cyano, carboxyl, carbamoyl, NO₂, hydroxyl, C₁-C₄-alkoxy, C₁-C₄-haloalkoxy, C₁-C₄-alkylthio, C₁-C₄-alkylsulphinyl, C₁-C₄-alkylsulphonyl, C₁-C₄-haloalkylthio, C₁-C₄-haloalkylsulphinyl, C₁-C₄-haloalkylsulphonyl, C₁-C₄-alkylamino, di-(C₁-C₄-alkyl)amino, C₃-C₆-cycloalkylamino, (C₁-C₆-alkyl)carbonyl, (C₁-C₆-alkoxy)carbonyl or

20 R³ is preferably C₂-C₄-alkoxycarbonyl, C₂-C₄-alkylcarbonyl, C₂-C₄-alkylaminocarbonyl or C₂-C₄-dialkylaminocarbonyl, or

25 R³ is preferably a phenyl ring, a 5- or 6-membered aromatic heterocyclic ring or a 4-, 5- or 6-membered partly saturated or saturated heterocyclic ring which may contain 1-3 heteroatoms from the group of N, S, O, where the phenyl ring or heterocyclic ring is optionally mono- or polysubstituted identically or differently, and where the substituents may each independently be selected from hydrogen, C₁-C₄-alkyl, C₂-C₄-alkenyl, C₂-C₄-alkynyl, C₃-C₆-cycloalkyl, C₁-C₄-haloalkyl, C₂-C₄-haloalkenyl, C₂-C₄-haloalkynyl, C₃-C₆-halocycloalkyl, halogen, cyano, carboxyl, carbamoyl, NO₂, hydroxyl, C₁-C₄-alkoxy, C₁-C₄-haloalkoxy, C₁-C₄-alkylthio, C₁-C₄-alkylsulphinyl, C₁-C₄-alkylsulphonyl, C₁-C₄-haloalkylthio, C₁-C₄-haloalkylsulphinyl, C₁-C₄-haloalkylsulphonyl, C₁-C₄-alkylamino, di-(C₁-C₄-alkyl)amino, C₃-C₆-cycloalkylamino, (C₁-C₄-alkyl)carbonyl, (C₁-C₄-alkoxy)carbonyl,

30 R³ is more preferably hydrogen or in each case optionally mono- or polysubstituted identically or

- differently, C₁-C₄-alkyl, or C₃-C₆-cycloalkyl, where the substituents may each independently be selected from halogen, cyano, carboxyl, hydroxyl, C₁-C₄-alkyl, C₁-C₄-haloalkyl, C₃-C₆-cycloalkyl, C₁-C₄-alkoxy, C₁-C₄-haloalkoxy, C₁-C₄-alkylthio, C₁-C₄-alkylsulphinyl, C₁-C₄-alkylsulphonyl, C₂-C₄-alkoxycarbonyl, C₂-C₆-alkylcarbonyl or a phenyl ring or a 4-, 5- or 6-membered aromatic, partly saturated or saturated heterocyclic ring, where the phenyl ring or heterocyclic ring is optionally mono- or polysubstituted identically or differently, and where the substituents may each independently be selected from hydrogen, C₁-C₄-alkyl, C₃-C₆-cycloalkyl, C₁-C₄-haloalkyl, C₂-C₄-haloalkenyl, C₂-C₄-haloalkynyl, C₃-C₆-halocycloalkyl, halogen, cyano, hydroxyl, C₁-C₄-alkoxy, C₁-C₄-haloalkoxy, or
- 10 R³ is more preferably C₂-C₄-alkoxycarbonyl, C₂-C₄-alkylcarbonyl, C₂-C₄-alkylaminocarbonyl, or
- R³ is more preferably a phenyl ring, a 5- or 6-membered aromatic heterocyclic ring or a 4-, 5- or 6-membered partly saturated or saturated heterocyclic ring which may contain 1-3 heteroatoms from the group of N, S, O, where the phenyl ring or heterocyclic ring is optionally mono- or polysubstituted identically or differently, and where the substituents may each independently be
- 15 selected from hydrogen, C₁-C₄-alkyl, C₂-C₄-alkenyl, C₂-C₄-alkynyl, C₃-C₆-cycloalkyl, C₁-C₄-haloalkyl, C₂-C₄-haloalkenyl, C₂-C₄-haloalkynyl, C₃-C₆-halocycloalkyl, halogen, cyano, carbamoyl, NO₂, hydroxyl, C₁-C₄-alkoxy, C₁-C₄-haloalkoxy, or
- R³ is even more preferably hydrogen, methyl, ethyl, n-propyl, isopropyl, n-butyl, isobutyl, sec-butyl, tert-butyl, cyclopropyl, cyclobutyl, azetidine, oxetane, thietane, pyrrolidine, pyrazolidine,
- 20 imidazolidine, imidazolidinone, tetrahydrofuran, tetrahydrothiophene, tetrahydrothiophene dioxide, thiazoline, thiazolidine, piperidine, piperazine, tetrahydropyran, dihydrofuranone, dioxane, morpholine, thiomorpholine, thiomorpholine dioxide, phenyl, pyridyl, or
- R³ is especially preferably hydrogen, methyl, isopropyl, cyclopropyl or tert-butyl.
- R⁴ is preferably hydrogen, C₁-C₄-alkyl, C₁-C₄-haloalkyl, halogen, cyano, C₁-C₄-alkoxy, C₁-C₄-haloalkoxy, C₁-C₄-alkylthio or C₁-C₄-haloalkylthio,
- 25 two adjacent R⁴ radicals are likewise preferably -(CH₂)₃-, -(CH₂)₄-, -(CH₂)₅-, -(CH=CH)₂-, -OCH₂O-, -O(CH₂)₂O-, -OCF₂O-, -(CF₂)₂O-, -O(CF₂)₂O-, -(CH=CH-CH=N)- or -(CH=CH-N=CH)-,
- R⁴ is more preferably hydrogen, C₁-C₄-alkyl, C₁-C₂-haloalkyl, halogen, cyano or C₁-C₂-haloalkoxy,
- two adjacent R⁴ radicals are more preferably -(CH₂)₄-, -(CH=CH)₂-, -O(CH₂)₂O-, -O(CF₂)₂O-, -
- 30 (CH=CH-CH=N)- or -(CH=CH-N=CH)-,
- R⁴ is even more preferably hydrogen, methyl, trifluoromethyl, cyano, fluorine, chlorine, bromine,

iodine or trifluoromethoxy. Even more preferably, two adjacent R^4 radicals are also $-(CH_2)_4-$, or $-(CH=CH)_2-$.

R^4 is especially preferably chlorine, fluorine or bromine,

R^4 is also especially preferably iodine or cyano,

5 two adjacent R^4 radicals are especially preferably $-(CH=CH)_2$

n is preferably 0, 1, 2,

n is more preferably 1 or 2,

n is even more preferably 1,

10 R^5 is preferably C_1 - C_4 -alkyl, C_3 - C_6 -cycloalkyl, C_1 - C_4 -haloalkyl, C_1 - C_6 -halocycloalkyl, C_2 - C_6 -alkenyl, C_2 - C_4 -haloalkenyl, C_2 - C_4 -alkynyl, C_2 - C_4 -haloalkynyl, C_1 - C_4 -alkoxy, C_1 - C_4 -haloalkoxy, C_1 - C_4 -alkylthio, C_1 - C_4 -alkylsulphinyl, C_1 - C_4 -alkylsulphonyl, C_1 - C_4 -haloalkylthio, C_1 - C_4 -haloalkylsulphinyl, C_1 - C_4 -haloalkylsulphonyl, halogen, cyano, nitro or C_3 - C_6 -trialkylsilyl,

15 R^5 is more preferably C_1 - C_4 -alkyl, C_3 - C_6 -cycloalkyl, C_1 - C_4 -haloalkyl, C_1 - C_6 -halocycloalkyl, C_2 - C_6 -alkenyl, C_2 - C_4 -haloalkenyl, C_2 - C_4 -alkynyl, C_2 - C_4 -haloalkynyl, C_1 - C_4 -alkoxy, C_1 - C_4 -haloalkoxy, fluorine, chlorine, bromine, iodine, cyano, nitro or C_3 - C_6 -trialkylsilyl,

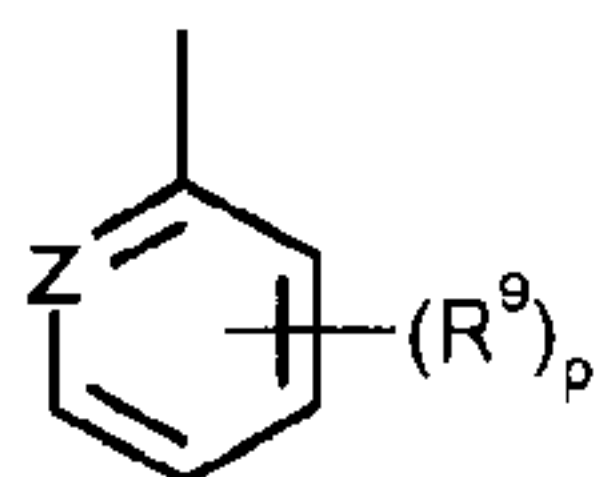
R^5 is even more preferably methyl, fluorine, chlorine, bromine or iodine,

R^5 is especially preferably methyl or chlorine,

20 Q_X is preferably an optionally singly or multiply, identically or differently R^7 -substituted 5-6 membered heteroaromatic ring which may contain 1-3 heteroatoms from the group of N, O, S, or is phenyl,

Q_X is more preferably an optionally singly or multiply, identically or differently R^7 -substituted, 5- or 6-membered ring selected from the group consisting of furan, thiophene, triazole, imidazole, thiazole, oxazole, isoxazole, isothiazole, thiadiazole, oxadiazole, pyrrole, pyridine, pyrimidine, pyridazine, pyrazine, phenyl or pyrazole,

25 Q_X is even more preferably thiazole, oxazole, pyrrole, imidazole, triazole, pyrimidine, phenyl or pyrazole monosubstituted by the R^7 group



where Z, R and p may have the general definitions specified above or the preferred or more preferred definitions specified below,

- A is preferably optionally mono- or polysubstituted $-(C_1-C_4\text{-alkylene})-$, $-(C_2-C_4\text{-alkenylene})-$, $-(C_2-C_4\text{-alkynylene})-$, $-R^8-(C_3-C_6\text{-cycloalkyl})-R^8-$, $-R^8-O-R^8-$, $-R^8-S-R^8-$, $-R^8-S(=O)-R^8-$, $-R^8-S(=O)_2-R^8-$, $-R^8-NH-(C_1-C_4\text{-alkyl})-$, $-R^8-N(C_1-C_4\text{-alkyl})-R^8$, $-R^8-C=NO(C_1-C_4\text{-alkyl})$, $-R^8-C(=O)-R^8$, $-R^8-C(=S)-R^8$, $-R^8-C(=O)NH-R^8$, $R^8-C(=O)N(C_1-C_4\text{-alkyl})-R^8$, $-R^8-S(=O)_2NH-R^8$, $-R^8-S(=O)_2N(C_1-C_4\text{-alkyl})-R^8$, $-R^8-NH(C=O)O-R^8$, $-R^8-N(C_1-C_4\text{-alkyl})-(C=O)O-R^8$, $-R^8-NH(C=O)NH-R^8$, $-R^8-NHS(=O)_2-R^8$, $-R^8-N(C_1-C_4\text{-alkyl})S(=O)_2-R^8$, R^8-NH-R^8 , $R^8-C(=O)-C(=O)-R^8$, $R^8-C(OH)-R^8$, R^8-Qz-R^8 ,

- 10 where the substituents may each independently be selected from halogen, cyano, nitro, hydroxyl, C_1-C_6 -alkyl, C_1-C_6 -alkoxy or halogen- C_1-C_6 -alkyl,

where Qz may have the general definitions specified above or the preferred or more preferred definitions specified below,

- A is more preferably $-CH_2-$, $-CH_2O-$, $-CH_2OCH_2-$, $-CH_2S-$, $-CH_2SCH_2-$, $-CH_2N(C_1-C_4\text{-alkyl})-$, $-CH_2N(C_1-C_4\text{-alkyl})CH_2-$, $-CH(Hal)-$, $-C(Hal)_2-$, $-CH(CN)-$, $CH_2(CO)-$, $CH_2(CS)-$, $CH_2CH(OH)-$, $-cyclopropyl-$, $CH_2(CO)CH_2-$, $-CH(C_1-C_4\text{-alkyl})-$, $-C(di-C_1-C_6\text{-alkyl})-$, $-CH_2CH_2-$, $-CH=CH-$, $-C\equiv C-$, $-C=NO(C_1-C_6\text{-alkyl})$, $-C(=O)(C_1-C_4\text{-alkyl})-$,

- A is even more preferably $-CH_2-$, $-CH(CH_3)$, $C(CH_3)_2$, $-CH_2CH_2-$, $-CH(CN)-$, $-CH_2O-$ or $-C(=O)-CH_2-$,

- 20 A is especially preferably CH_2 , $CH(CH_3)$, $-CH_2O-$ or $-C(=O)-CH_2-$,

Qz is preferably a 3- to 4-membered, partly saturated or saturated, or a 5 to 6-membered, partly saturated, saturated or aromatic ring, where the ring may optionally contain 1-3 heteroatoms from the group of N,S,O,

- 25 where the ring is optionally mono- or polysubstituted identically or differently, and where the substituents may each independently be selected from hydrogen, C_1-C_6 -alkyl, C_2-C_6 -alkenyl, C_2-C_6 -alkynyl, C_3-C_6 -cycloalkyl, C_1-C_6 -haloalkyl, C_2-C_6 -haloalkenyl, C_2-C_6 -haloalkynyl, C_3-C_6 -halocycloalkyl, halogen, cyano, hydroxyl, C_1-C_4 -alkoxy, C_1-C_4 -haloalkoxy, C_1-C_4 -alkylthio, C_1-C_4 -alkylsulphinyl, C_1-C_4 -alkylsulphonyl, C_1-C_4 -haloalkylthio, C_1-C_4 -haloalkylsulphinyl, C_1-C_4 -haloalkylsulphonyl,

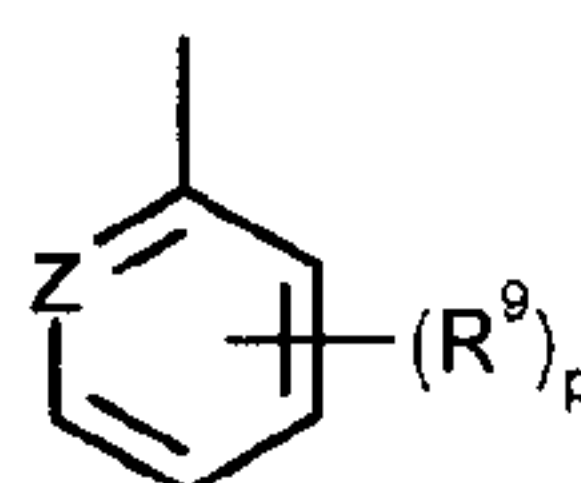
Qz is more preferably a 3- to 4-membered, partly saturated or saturated, or a 5-membered, partly saturated, saturated or aromatic ring, where the ring may optionally contain 1-2 heteroatoms from the group of N,S,O,

where the ring is optionally mono- or polysubstituted identically or differently, and where the substituents may each independently be selected from hydrogen, C₁-C₆-alkyl, C₂-C₆-alkenyl, C₂-C₆-alkynyl, C₃-C₆-cycloalkyl, C₁-C₆-haloalkyl, C₂-C₆-haloalkenyl, C₂-C₆-haloalkynyl, C₃-C₆-halocycloalkyl, halogen, cyano, hydroxyl, C₁-C₄-alkoxy, C₁-C₄-haloalkoxy, C₁-C₄-alkylthio, C₁-C₄-alkylsulphinyl, C₁-C₄-alkylsulphonyl, C₁-C₄-haloalkylthio, C₁-C₄-haloalkylsulphinyl, C₁-C₄-haloalkylsulphonyl,

Qz is even more preferably azetidine, oxetane or thietane, pyrrolidine, pyrroline, pyrazolidine, pyrazoline, imidazolidine, imidazolidone, imidazoline, tetrahydrofuran, tetrahydrothiophene, thiazolidine, isothiazolidine, isoxazoline,

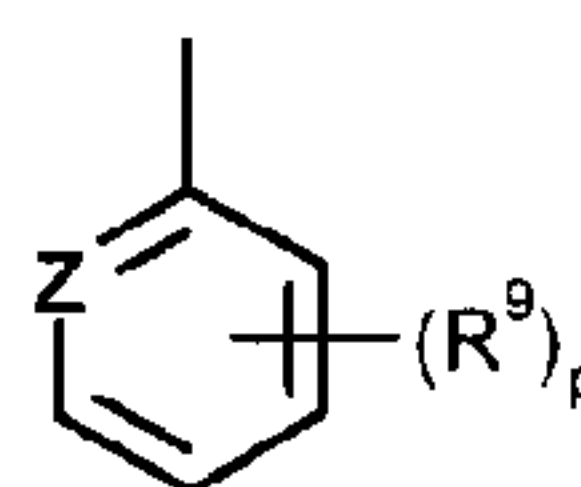
which is optionally mono- or polysubstituted identically or differently, and where the substituents may each independently be selected from hydrogen, methyl, ethyl, isopropyl, hydroxyl, methoxy, trifluoromethoxy, fluorine, chlorine, bromine, cyano, difluoromethyl, trifluoromethyl,

15 R⁷ is preferably C₁-C₆-alkyl or the radical



R⁷ is additionally preferably C₃-C₆-cycloalkoxy,

R⁷ is more preferably methyl or the radical



20

R⁹ is independently preferably hydrogen, halogen, cyano, C₁-C₄-alkyl, C₁-C₄-alkoxy, C₁-C₄-haloalkyl, C₁-C₄-haloalkoxy, C₁-C₄-haloalkylsulphonyl or (C₁-C₄-alkyl)C₁-C₄-alkoxyimino,

R⁹ is independently more preferably hydrogen, halogen, cyano or C₁-C₄-haloalkyl,

R⁹ is independently even more preferably fluorine, chlorine or bromine,

- R^9 is especially preferably chlorine,
- p is preferably 1, 2 or 3,
- p is more preferably 1 or 2,
- p is even more preferably 1,
- 5 Z is preferably N, CH, CF, CCl, CBr or Cl,
- Z is more preferably N, CH, CF, CCl or CBr,
- Z is even more preferably N, CCl or CH,
- R^8 is preferably linear or branched $-(C_1-C_4\text{-alkylene})-$ or a direct bond
- R^8 is more preferably methyl, ethyl, propyl, isopropyl, n-butyl, sec-butyl or isobutyl or a direct bond
- 10 R^8 is even more preferably methyl or ethyl or a direct bond
- Q_Y is preferably a 5- or 6-membered, partly saturated or saturated heterocyclic or heteroaromatic ring or an aromatic 8-, 9- or 10-membered fused heterobicyclic ring system, where the heteroatoms may be selected from the group of N, S, O, where the ring or ring system is optionally mono- or polysubstituted identically or differently, and where the substituents may each independently be
- 15 selected from hydrogen, C_1-C_6 -alkyl, C_2-C_6 -alkenyl, C_2-C_6 -alkynyl, C_3-C_6 -cycloalkyl, C_1-C_6 -haloalkyl, C_2-C_6 -haloalkenyl, C_2-C_6 -haloalkynyl, C_3-C_6 -halocycloalkyl, halogen, cyano, carboxyl, carbamoyl, nitro, hydroxyl, C_1-C_4 -alkoxy, C_1-C_4 -haloalkoxy, C_1-C_4 -alkylthio, C_1-C_4 -alkylsulphinyl, C_1-C_4 -alkylsulphonyl, C_1-C_4 -haloalkylthio, C_1-C_4 -haloalkylsulphinyl, C_1-C_4 -haloalkylsulphonyl,
- 20 or where the substituents may each independently be selected from phenyl or a 5- or 6-membered heteroaromatic ring, where phenyl or the ring may optionally be mono- or polysubstituted identically or differently by C_1-C_6 -alkyl, C_2-C_6 -alkenyl, C_2-C_6 -alkynyl, C_3-C_6 -cycloalkyl, C_1-C_6 -haloalkyl, C_2-C_6 -haloalkenyl, C_2-C_6 -haloalkynyl, C_3-C_6 -halocycloalkyl, halogen, cyano, nitro, hydroxyl, C_1-C_4 -alkoxy, C_1-C_4 -haloalkoxy,
- 25 Q_Y is more preferably is an optionally mono- or polysubstituted 5- or 6-membered heteroaromatic ring from the group of Q-1 to Q-53 and Q-58 to Q-59, Q62 to Q63, an aromatic 9-membered fused heterobicyclic ring system Q-54 to Q-56 and a 5-membered heterocyclic ring Q-60 to Q-61, where the substituents may each independently be selected from C_1-C_3 -alkyl, C_1-C_3 -haloalkyl, C_1-C_2 -alkoxy, halogen, cyano, hydroxyl, nitro or C_1-C_2 -haloalkoxy,

or where the substituents may each independently be selected from phenyl or einem 5- or 6-membered heteroaromatic ring, where phenyl or the ring may optionally be mono- or polysubstituted identically or differently by C₁-C₆-alkyl, C₂-C₆-alkenyl, C₂-C₆-alkynyl, C₃-C₆-cycloalkyl, C₁-C₆-haloalkyl, C₂-C₆-haloalkenyl, C₂-C₆-haloalkynyl, C₃-C₆-halocycloalkyl, halogen, cyano, NO₂, hydroxyl, C₁-C₄-alkoxy, 5 C₁-C₄-haloalkoxy,

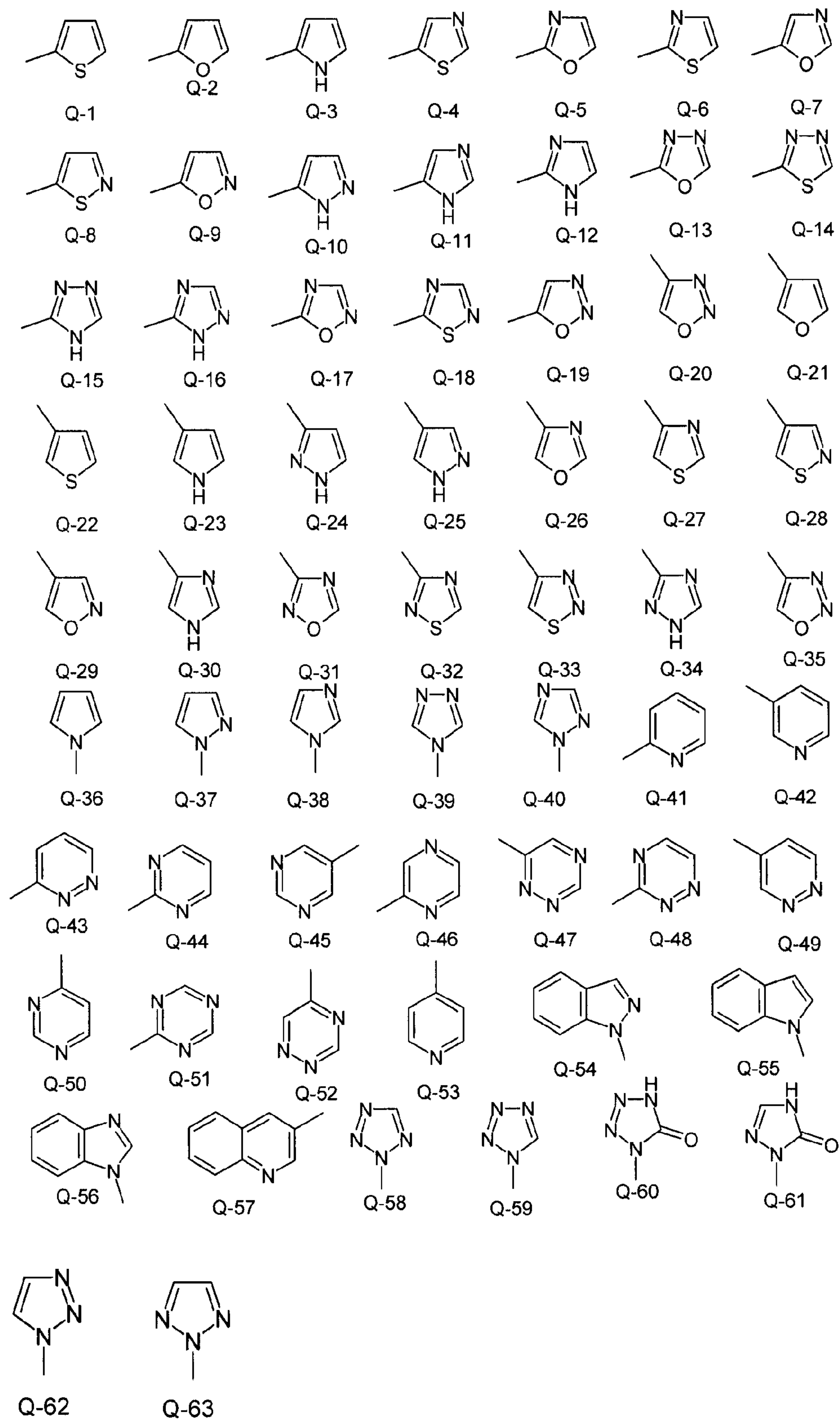
Q_Y is even more preferably an optionally mono- or polysubstituted 5- or 6-membered heteroaromatic ring from the group of Q-36 to Q-40, Q43, Q-58 to Q-59, Q62, Q63, an aromatic 9-membered fused heterobicyclic ring system Q-54 to Q-56 and a 5-membered heterocyclic ring Q-60 to Q-61, where the substituents may each independently be selected from C₁-C₃-alkyl, C₁-C₃-haloalkyl, C₁-C₂-alkoxy, 10 C₂-alkoxy, halogen, cyano, hydroxyl, nitro or C₁-C₂-haloalkoxy,

or where the substituents may each independently be selected from phenyl or einem 5- or 6-membered heteroaromatic ring, where phenyl or the ring may optionally be mono- or polysubstituted identically or differently by C₁-C₆-alkyl, C₂-C₆-alkenyl, C₂-C₆-alkynyl, C₃-C₆-cycloalkyl, C₁-C₆-haloalkyl, C₂-C₆-haloalkenyl, C₂-C₆-haloalkynyl, C₃-C₆-halocycloalkyl, halogen, cyano, nitro, C₁-C₄-alkoxy, C₁-C₄-haloalkoxy, 15 haloalkoxy,

Q_Y is especially preferably an optionally mono- or polysubstituted identically or differently, heteroaromatic ring from the group of Q-37, Q-38, Q-39, Q-40, Q43, Q-58, Q-59, Q62 and Q63, and a 5-membered heterocyclic ring Q-60, where the substituents may each independently be selected from methyl, ethyl, cyclopropyl, tert-butyl, chlorine, fluorine, iodine, bromine, cyano, 20 nitro, difluoromethyl, trifluoromethyl, pentafluoroethyl, heptafluoro-n-propyl and heptafluoroisopropyl

or where the substituents may each independently be selected from phenyl or a 5- or 6-membered heteroaromatic ring, where the substituents may each independently be selected from methyl, ethyl, cyclopropyl, tert-butyl, chlorine, fluorine, iodine, bromine, cyano, nitro, difluoromethyl, 25 trifluoromethyl, pentafluoroethyl, heptafluoro-n-propyl and heptafluoroisopropyl,

- 18 -



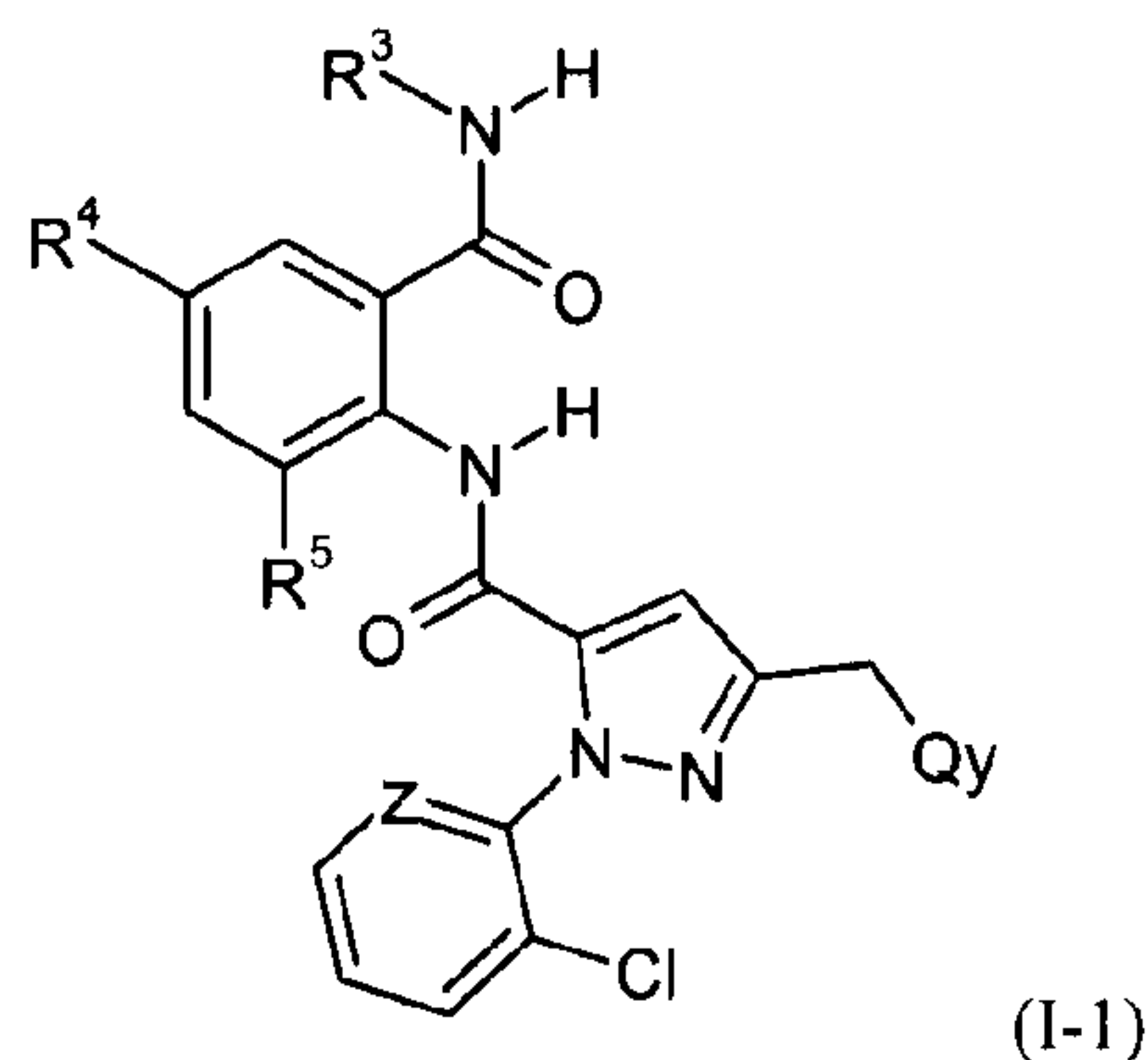
The rings or ring systems shown above may optionally each independently be additionally substituted by oxo, thio, $(=O)=NH$, $(=O)=N-CN$, $(=O)_2$. Examples include tetrahydrothiophene dioxide, imidazolidone.

5 The oxo group as a substituent on a ring carbon atom is then, for example, a carbonyl group in the heterocyclic ring. As a result, lactones and lactams are preferably also included. The oxo group can also occur on the ring heteroatoms which can occur in different oxidation states, for example in the case of N and S, and then form, for example, the divalent groups $-N(O)-$, $-S(O)-$ (or SO for short) and $-S(O)_2-$ (or SO_2 for short) in the heterocyclic ring. In the case of $-N(O)-$ and $-S(O)-$ groups, both enantiomers are included in each case.

10 Substituents other than the oxo group may also be bonded to a heteroatom on a heterocyclic ring, for example to a nitrogen atom when a hydrogen atom on the nitrogen atom of the base skeleton is replaced. In the case of the nitrogen atom and also of other heteroatoms, for example of the sulphur atom, further substitution to form quaternary ammonium compounds or sulphonium compounds is also a possibility.

More particularly, the compounds of the formula (I) may be present in the form of different regioisomers:
 15 for example in the form of mixture of compounds with the definition of Q62 and Q63 or in the form of mixtures of Q58 and Q59. The invention therefore also encompasses active ingredient combinations comprising mixtures of compounds of the formula (I) where Q_Y is defined as Q62 and Q63, and Q58 and Q59, and the compounds may be present in different mixing ratios, and one or more active ingredients from group (II). Preference is given to mixing ratios of compounds of the formula (I) in which the Q_Y
 20 radical is Q62 or Q58 to compounds of the formula (I) in which the Q_Y radical is Q63 or Q59 of 60:40 to 99:1, more preferably of 70:30 to 97:3, even more preferably of 80:20 to 95:5. Especially preferred are the following mixing ratios of a compound of the formula (I) where Q_Y is defined as Q62 or Q58 to the compound of the formula (I) where Q_Y is defined as Q63 or Q59: 80:20; 81:19; 82:18; 83:17; 84:16; 85:15, 86:14; 87:13; 88:12; 89:11; 90:10; 91:9; 92:8; 93:7; 96:6; 95:5.

25 Additionally preferred are active ingredient combinations comprising at least one active ingredient of the formula (I-1)



in which

R^3 is hydrogen or in each case optionally mono- or polysubstituted identically or differently, C_1 - C_6 -alkyl, C_1 - C_6 -alkoxy, C_2 - C_6 -alkenyl, C_2 - C_6 -alkynyl, C_3 - C_{12} -cycloalkyl, C_3 - C_{12} -cycloalkyl- C_1 - C_6 -alkyl, where the substituents may each independently be selected from halogen, amino, cyano, nitro, hydroxyl, C_1 - C_6 -alkyl, C_3 - C_6 -cycloalkyl, C_1 - C_4 -alkoxy, C_1 - C_4 -haloalkoxy, C_1 - C_4 -alkylthio, C_2 - C_6 -alkoxycarbonyl, C_1 - C_6 -alkylcarbonyl, C_3 - C_6 -cycloalkylamino or a 5- or 6-membered heteroaromatic ring,

R^4 is halogen, cyano or methyl,

R^5 is methyl or chlorine,

Z is N, CCl or CH,

Qy an optionally mono- or polysubstituted 5- or 6-membered heteroaromatic ring from the group of Q-36 to Q-40, Q43, Q-58 to Q-59, Q62, Q63, an aromatic 9-membered fused heterobicyclic ring system Q-54 to Q-56 and a 5-membered heterocyclic ring Q-60 to Q-61, where the substituents may each independently be selected from C_1 - C_3 -alkyl, C_1 - C_3 -haloalkyl, C_1 - C_2 -alkoxy, halogen, cyano, hydroxyl, nitro or C_1 - C_2 -haloalkoxy,

where the compounds of the formula (I-1) may be present in the form of salts,

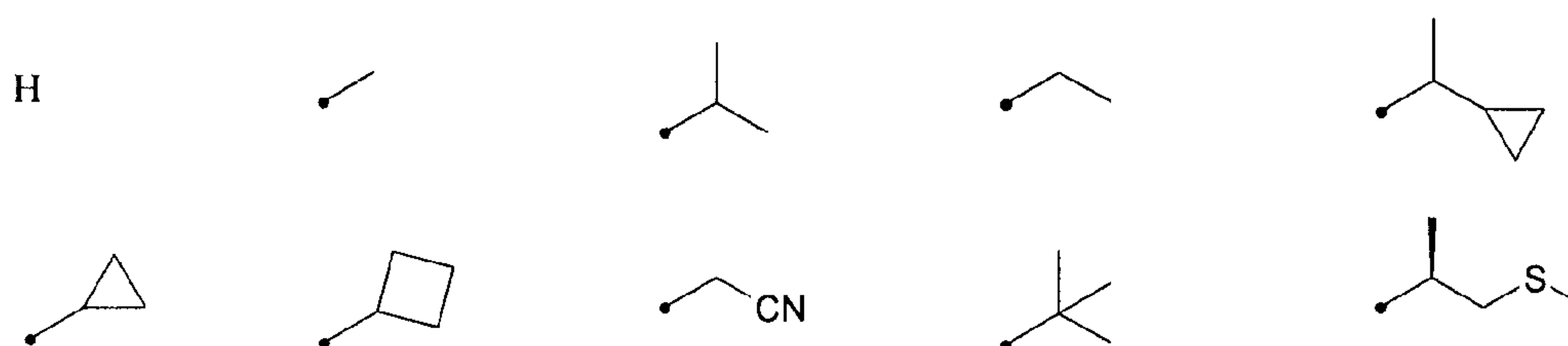
and one or more active ingredients selected from group (II).

More preferred combinations are those comprising at least one of the active ingredients of the formula (I-1) specified as preferred, more preferred, even more preferred or especially preferred, and one or more active ingredients selected from group (II).

Preferred, more preferred, even more preferred or especially preferred active ingredients are those of the formula (I-1) where

R^3 is preferably hydrogen or in each case optionally mono- or polysubstituted identically or differently, C_1 - C_6 -alkyl, C_1 - C_6 -alkoxy, C_2 - C_6 -alkenyl, C_2 - C_6 -alkynyl, C_3 - C_6 -cycloalkyl, C_3 - C_6 -cycloalkyl- C_1 - C_6 -alkyl, where the substituents may each independently be selected from halogen, cyano, amino, hydroxyl, C_1 - C_6 -alkyl, C_1 - C_4 -alkoxy, C_1 - C_4 -haloalkoxy, C_1 - C_4 -alkylthio, C_3 - C_6 -cycloalkyl, a 5- or 6-membered heteroaromatic ring containing 1-2 heteroatoms from the group of N, O, S, where no two oxygen atoms in the ring are adjacent,

R^3 is more preferably one of the following radicals:



R^4 is preferably halogen, cyano or methyl,

10 R^4 is more preferably chlorine and cyano,

R^4 is likewise more preferably bromine, fluorine, iodine or methyl,

R^5 is preferably and more preferably methyl,

Z is preferably N or CH,

15 Q_Y is preferably an optionally mono- or polysubstituted identically or differently, heteroaromatic ring from the group of Q-37, Q-38, Q-39, Q-40, Q43, Q-58, Q-59, Q62 and Q63, and a 5-membered heterocyclic ring Q-60, where the substituents may each independently be selected from methyl, ethyl, cyclopropyl, tert-butyl, chlorine, fluorine, iodine, bromine, cyano, nitro, difluoromethyl, trifluoromethyl, pentafluoroethyl, heptafluoro-n-propyl and heptafluoroisopropyl.

20 Q_Y is more preferably an optionally mono- or polysubstituted identically or differently, heteroaromatic ring from the group of Q-58 and Q-59, where the substituents may each independently be selected from methyl, ethyl, cyclopropyl, tert-butyl, difluoromethyl, trifluoromethyl, pentafluoroethyl, n-heptafluoropropyl and isoheptafluoropropyl.

More particularly, the compounds of the formula (I-1) may be present in the form of different regioisomers, for example in the form of mixtures of compounds with the definition of Q62 and Q63 or in

- the form of mixtures of Q58 and Q59. The invention therefore also includes active ingredient combinations comprising mixtures of compounds of the formula (I-1) where Q_Y is defined as Q62 and Q63, and Q58 and Q59, and the compounds may be present in different mixing ratios, and one or more active ingredients from the group (II). Preference is given to mixing ratios of compounds of the formula (I)
- 5 in which the Q_Y radical is Q62 or Q58 to compounds of the formula (I) in which the Q_Y radical is Q63 or Q59 of 60:40 to 99:1, more preferably of 70:30 to 97:3, even more preferably of 80:20 to 95:5. Especially preferred are the following mixing ratios of a compound of the formula (I) where Q_Y is defined as Q62 or Q58 to the compound of the formula (I) where Q_Y is defined as Q63 or Q59: 80:20; 81:19; 82:18; 83:17; 84:16; 85:15; 86:14; 87:13; 88:12; 89:11; 90:10; 91:9; 92:8; 93:7; 96:6; 95:5.
- 10 Additionally preferred are active ingredient combinations comprising at least one active ingredient of the general formula (I) or (I-1) and an active ingredient from group (II) selected from

acrinathrin
alpha-cypermethrin
betacyfluthrin
cyhalothrin
cypermethrin
deltamethrin
esfenvalerate
etofenprox
fenpropathrin
fenvalerate
flucythrinate
lambda-cyhalothrin
gamma-cyhalothrin
permethrin
tau-fluvalinate
transfluthrin
zeta-cypermethrin
cyfluthrin
bifenthrin
tefluthrin
eflusalate
fubfenprox
pyrethrin
resmethrin

imidacloprid
acetamiprid
thiamethoxam
nitenpyram
thiacloprid
dinotefuran
clothianidin
imidaclothiz
chlorfluazuron
diflubenzuron
lufenuron
teflubenzuron
triflumuron
novaluron
flufenoxuron
hexaflumuron
bistrifluoron
noviflumuron
buprofezin
cyromazine
methoxyfenozide
tebufenozide
halofenozide
chromafenozide
endosulfan
fipronil
ethiprole
pyrafluprole
pyriprole
flubendiamide
chlorantraniliprole (Rynaxypyr)
cyazypyr
emamectin
emamectin benzoate
abamectin

ivermectin
milbemectin
lepimectin
tebufenpyrad
fenpyroximate
pyridaben
fenazaquin
pyrimidifen
tolfenpyrad
dicofol
cyenopyrafen
cyflumetofen
acequinocyl
fluacrypyrin
bifenazate
diafenthiuron
etoxazole
clofentezine
spinosad
triarathen
tetradifon
propargite
hexythiazox
bromopropylate
chinomethionat
amitraz
pyrifluquinazone
pymetrozine
flonicamid
pyriproxifen
diofenolan
chlorfenapyr
metaflumizone
indoxacarb
chlorpyrifos
spirodiclofen

- 25 -

spiromesifen
spirotetramat
pyridalyl
spinetoram
acephate
triazophos
profenofos
fenamiphos
4-[[[(6-chloropyrid-3-yl)methyl](2,2-difluoroethyl)amino}furan-2(5H)-one
cadusaphos
carbaryl
carbofuran
ethoprophos
thiodicarb
aldicarb
metamidophos
methiocarb
sulfoxaflor

Additionally likewise preferred are active ingredient combinations comprising at least one active ingredient of the general formula (I) or (I-I) and an active ingredient of group (II) selected from

Bacillus firmus I-1582
dichloropropene
dimethoate
metaldehyde
methomyl
cartap
oil (for example petroleum)
chloropierin
carbosulfan
dichlorvos
metam-sodium

- 26 -

phoxim
monocrotophos
oxamyl
methidathion
fenitrothion
terbufos
fluensulfone
imicyafos
11-(4-chloro-2,6-dimethylphenyl)-12-hydroxy-1,4-dioxo-9-azadispiro[4.2.4.2]tetradec-11-en-10-one
2-{6-[2-(5-fluoropyridin-3-yl)-1,3-thiazol-5-yl]pyridin-2-yl}pyrimidine

Additionally more preferred are active ingredient combinations comprising at least one active ingredient of the general formula (I) or (I-1) and an active ingredient from group (II) selected from

acrinathrin
alpha-cypermethrin
betacyfluthrin
cyhalothrin
cypermethrin
deltamethrin
lambda-cyhalothrin
gamma-cyhalothrin
transfluthrin
cyfluthrin
bifenthrin
tefluthrin
imidacloprid
acetamiprid
thiamethoxam
thiacloprid
dinotefuran

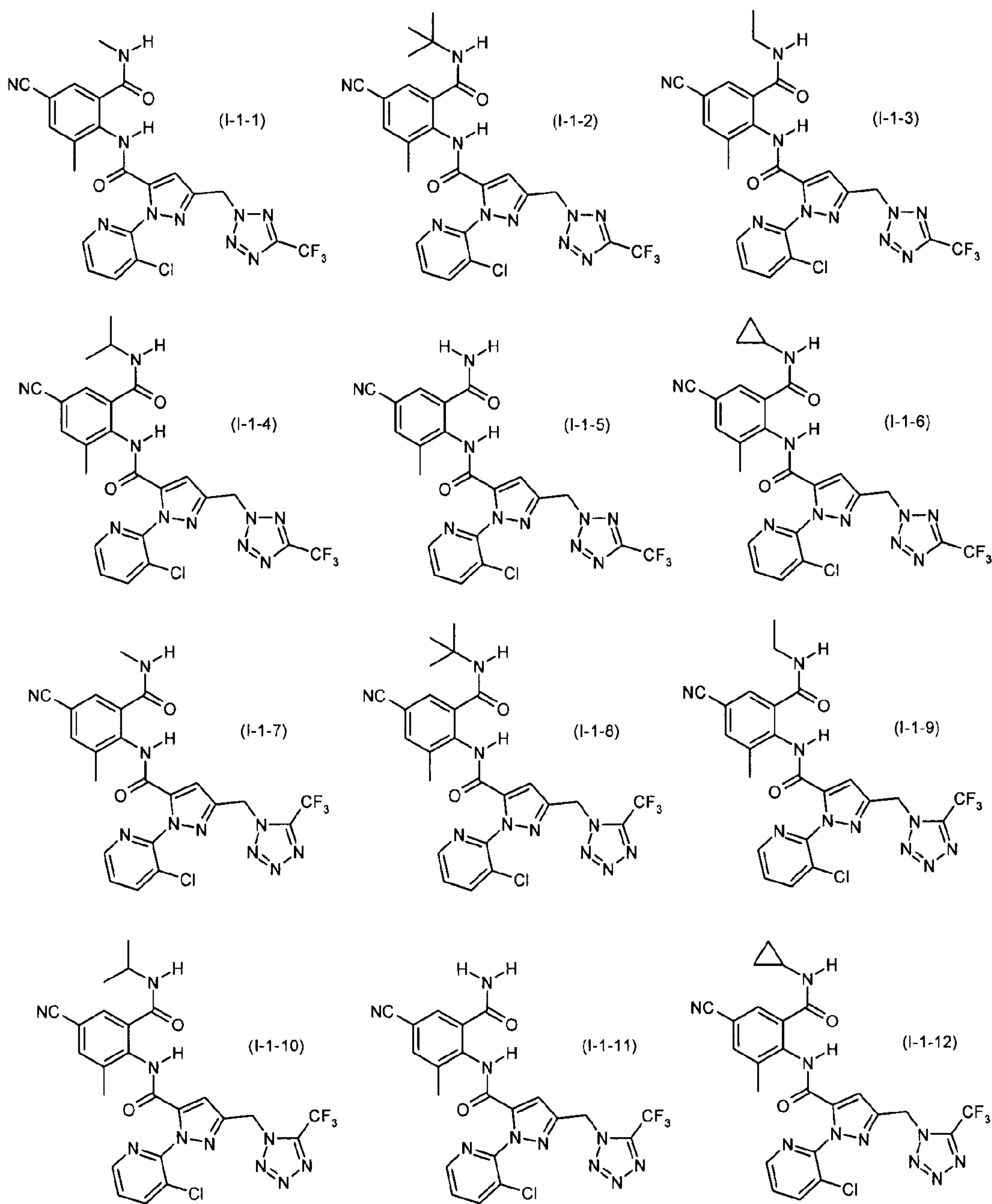
clothianidin
lufenuron
triflumuron
novaluron
flufenoxuron
buprofezin
methoxyfenozide
tebufenozide
fipronil
ethiprole
flubendiamide
chlorantraniliprole (Rynaxypyr)
cyazypyr
emamectin
emamectin benzoate
abamectin
milbemectin
tebufenpyrad
fenpyroximate
diafenthiuron
spinosad
flonicamid
chlorfenapyr
metaflumizone
indoxacarb
chlorpyrifos
spirodiclofen
spiromesifen
spirotetramat
pyridalyl
spinetoram
acephate
triazophos
profenofos
fenamiphos
4-{{(6-chloropyrid-3-

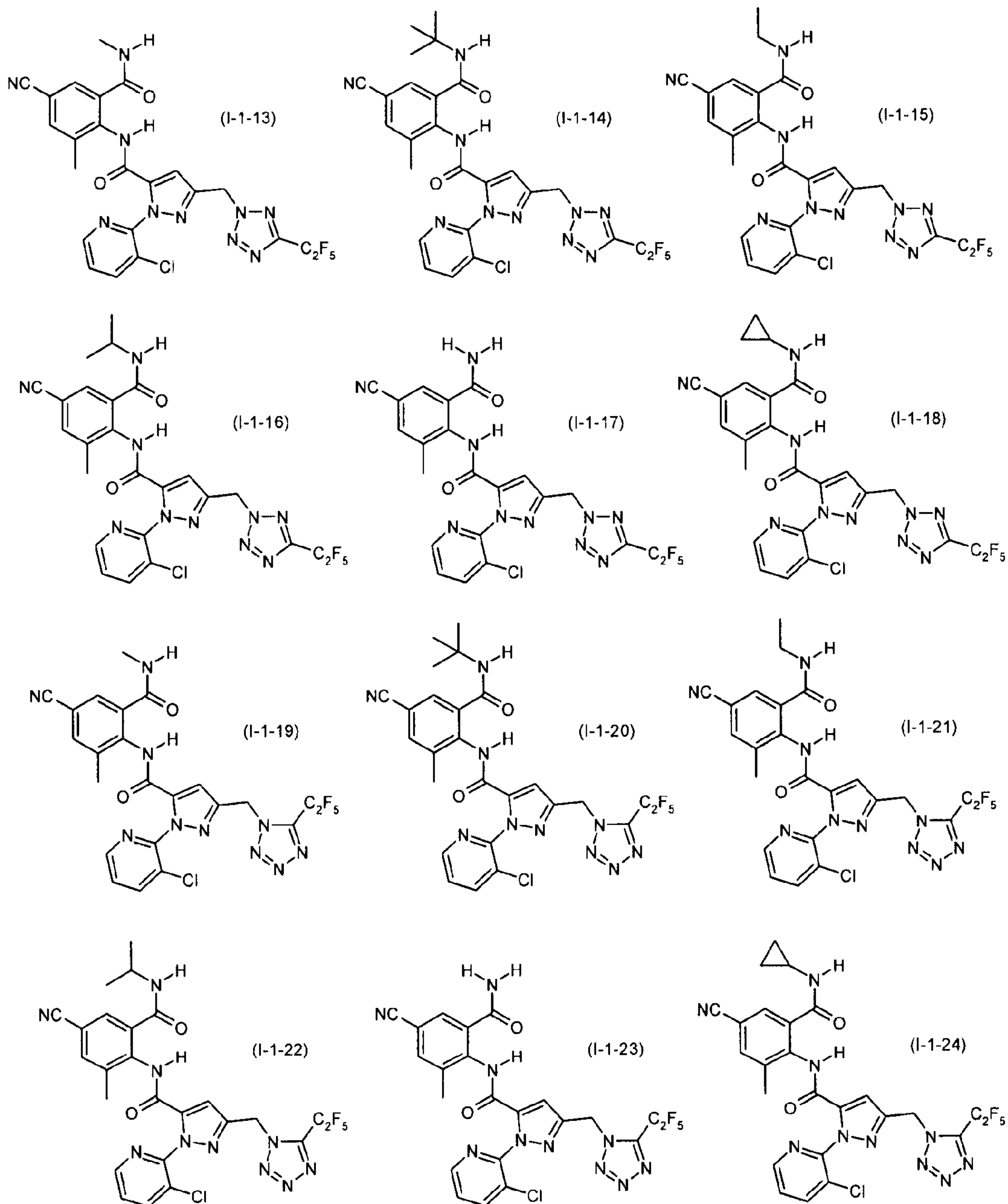
yl)methyl](2,2-difluoro-ethyl)amino} furan-2(5H)-one
cadusaphos
carbaryl
carbofuran
ethoprophos
thiodicarb
aldicarb
metamidophos
methiocarb
sulfoxaflor

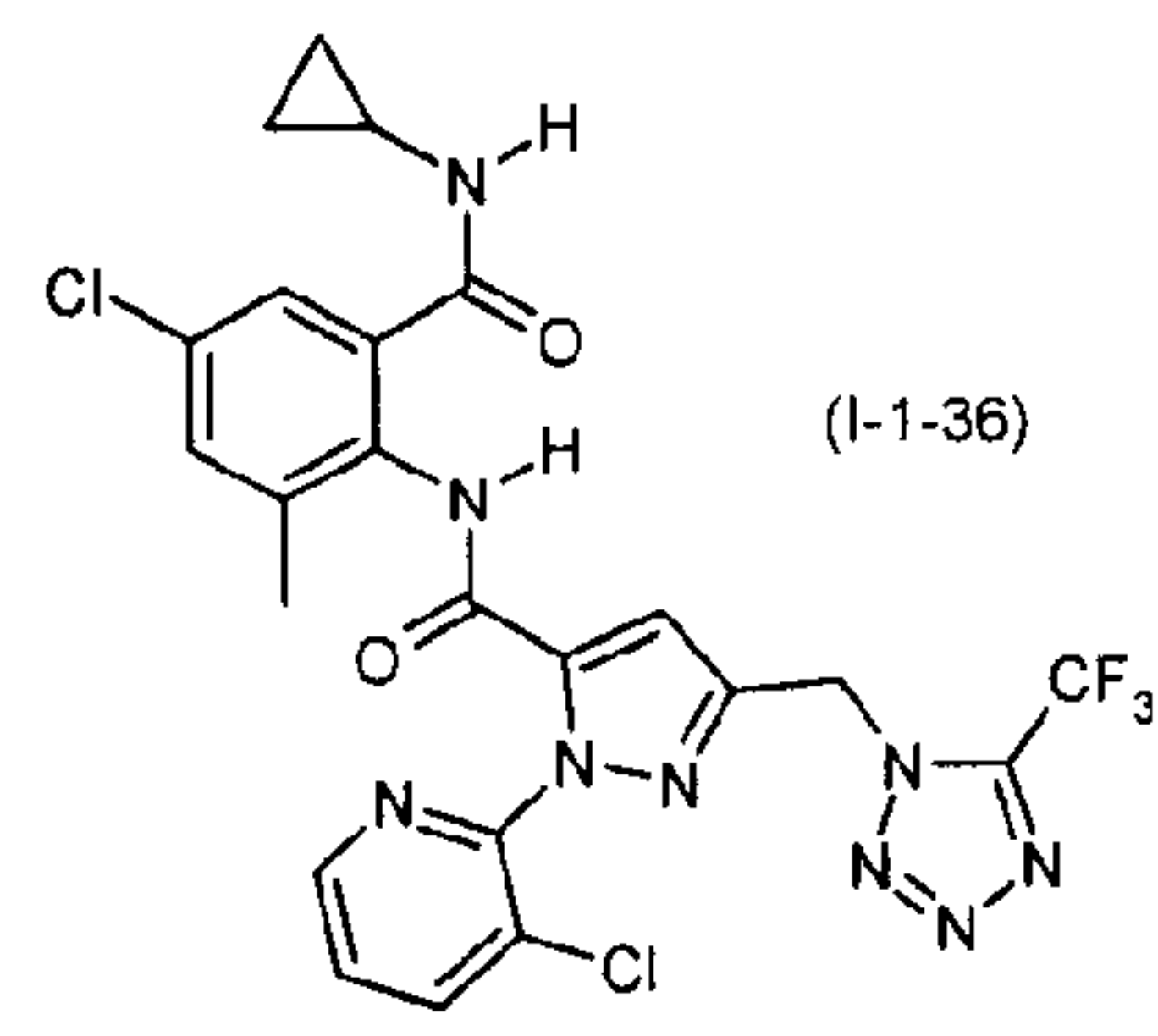
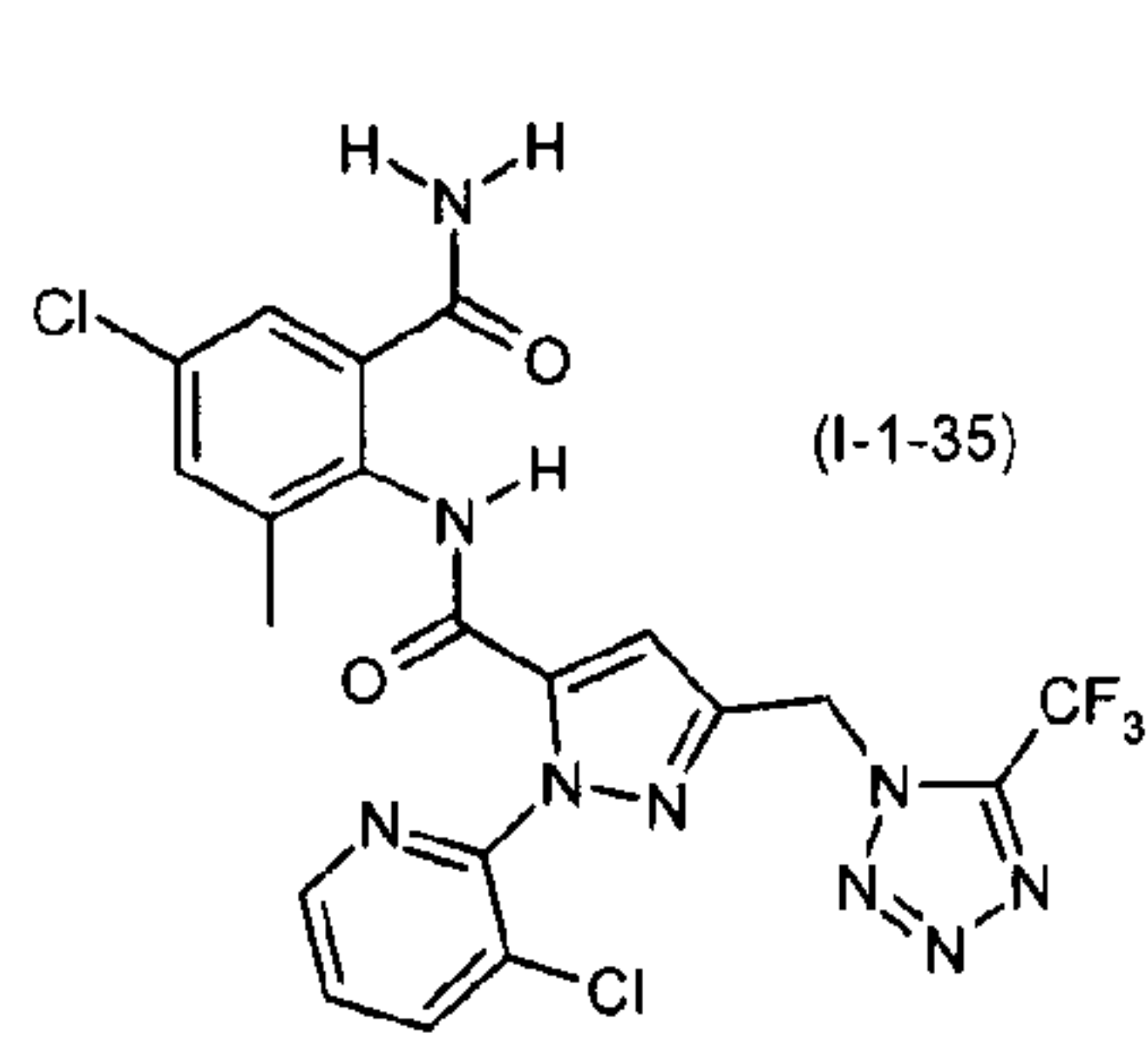
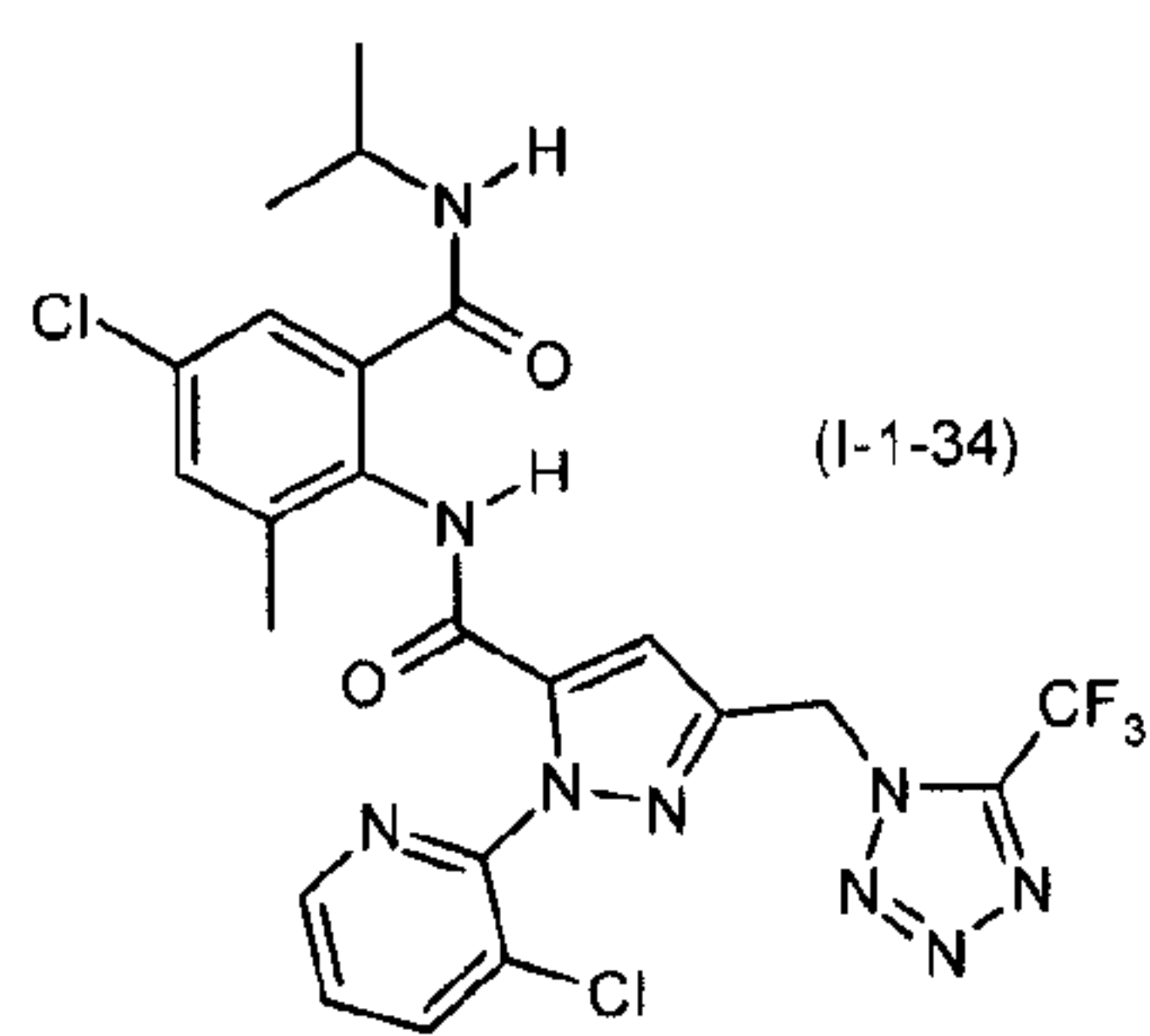
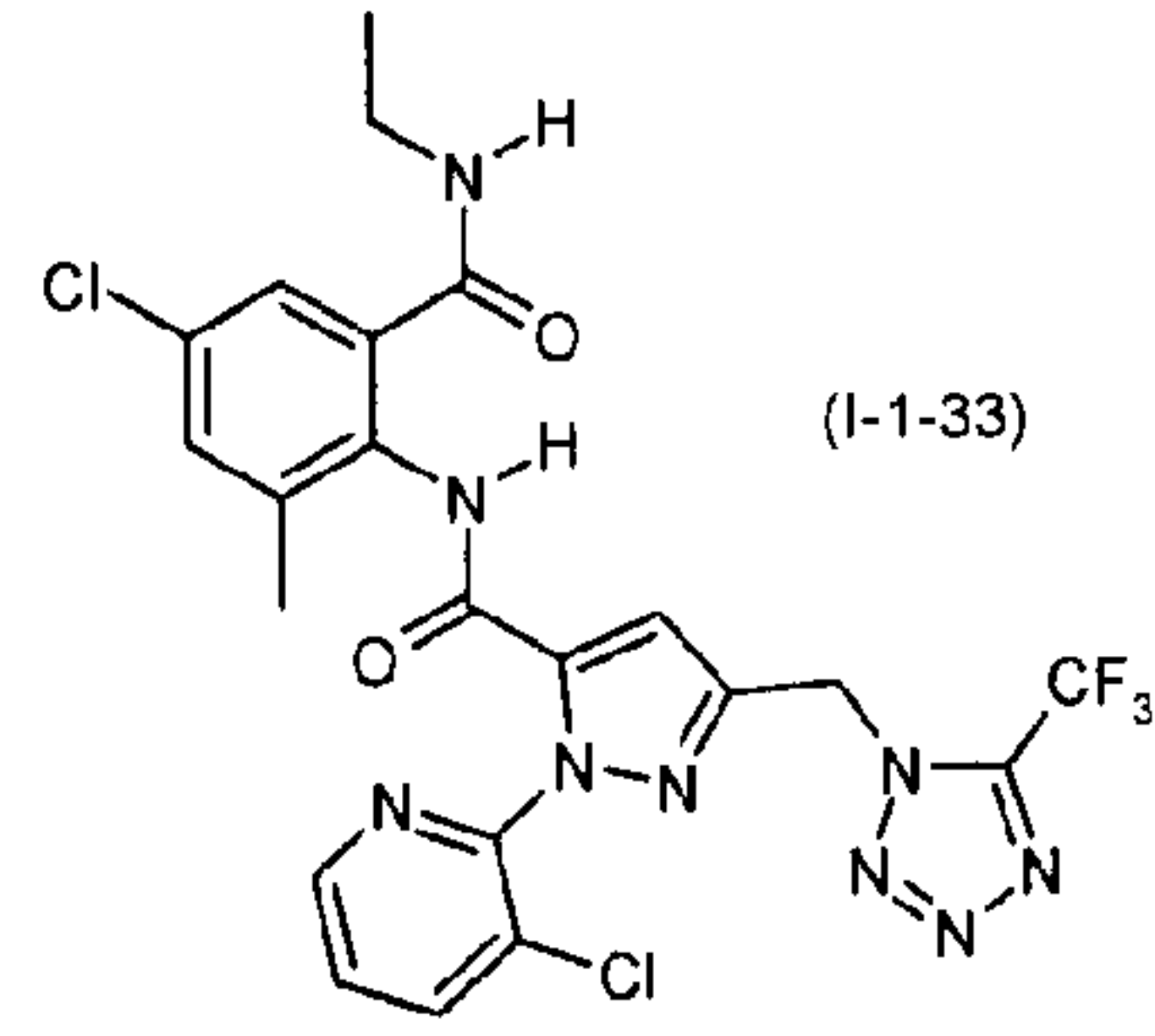
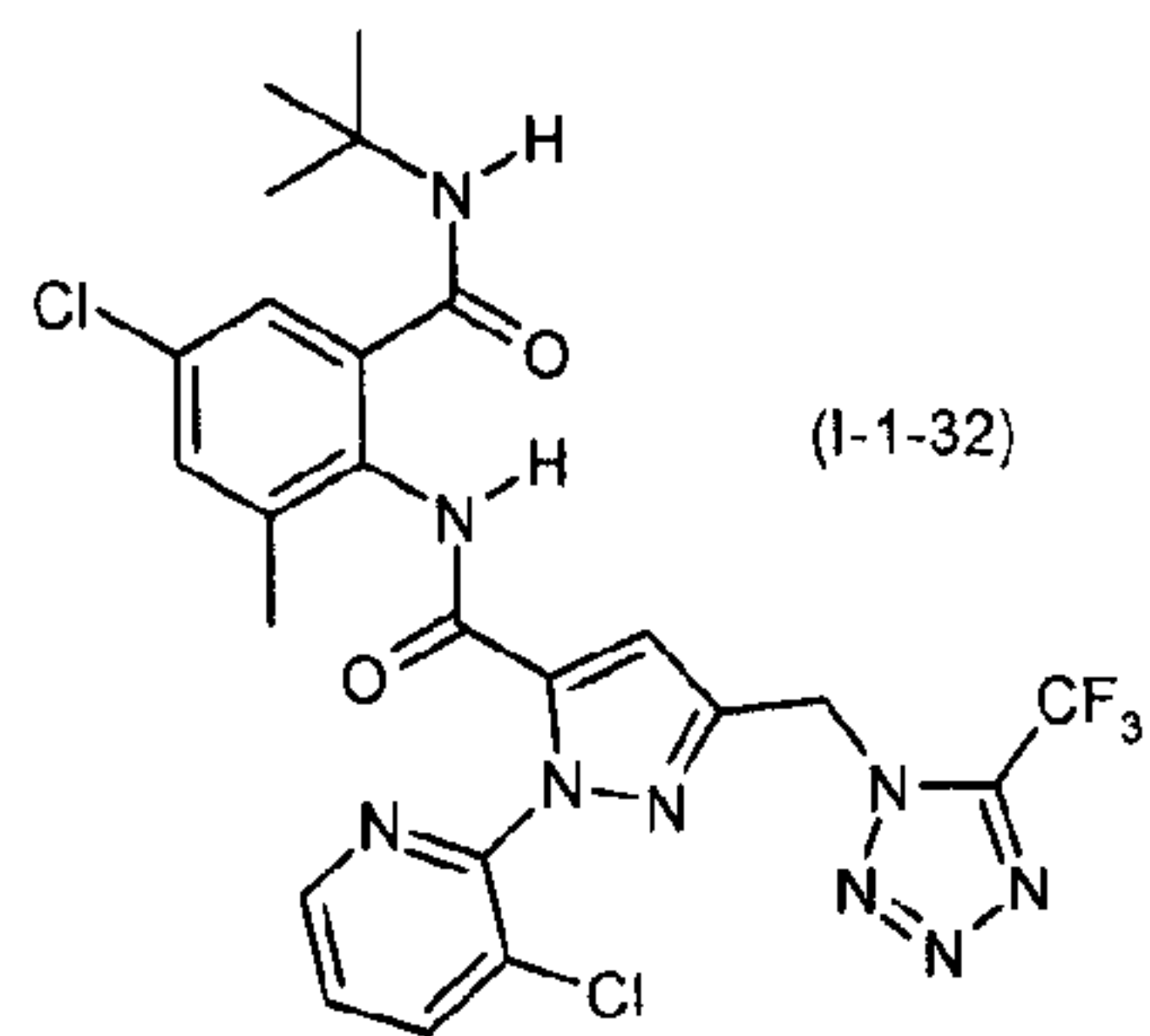
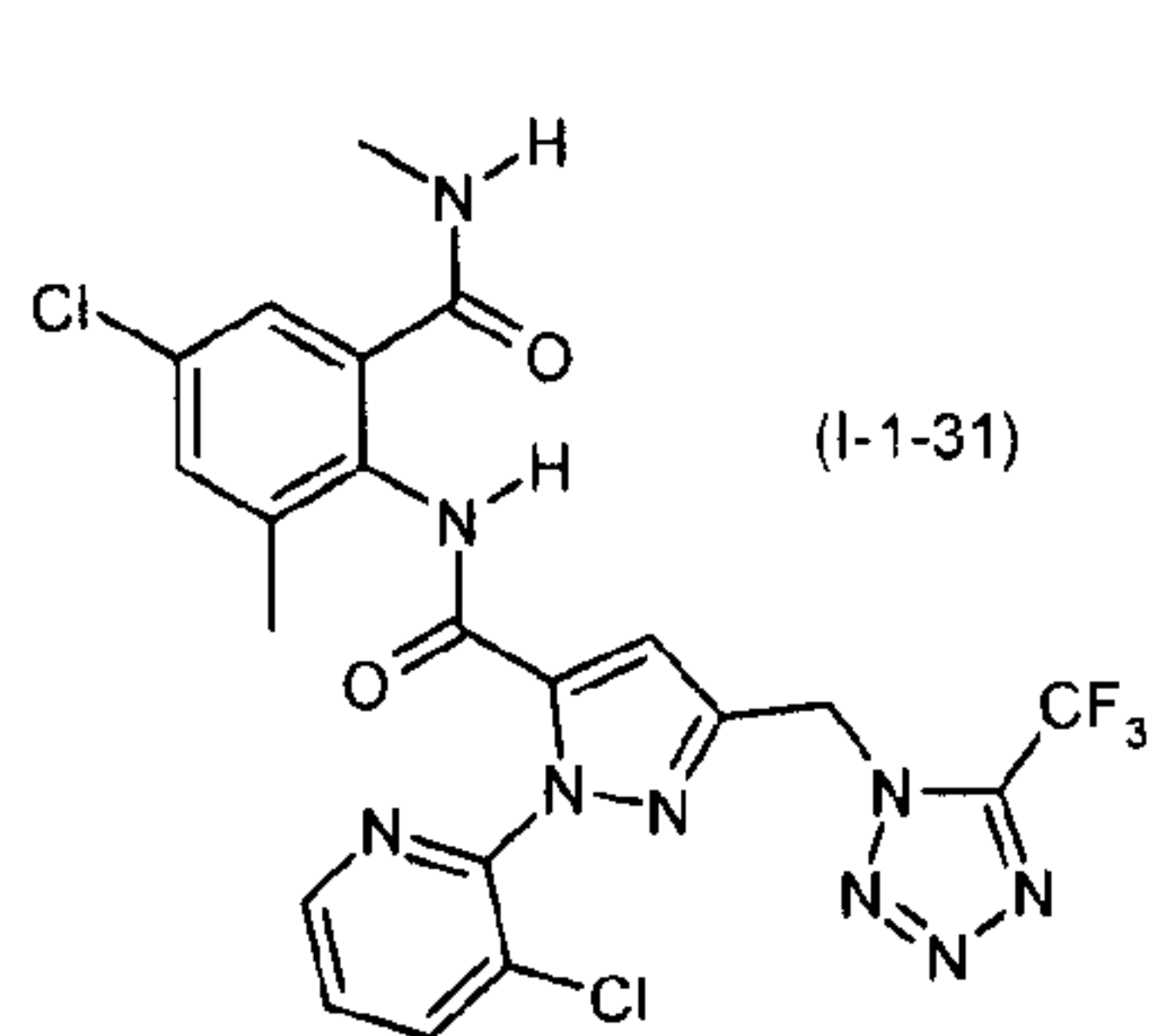
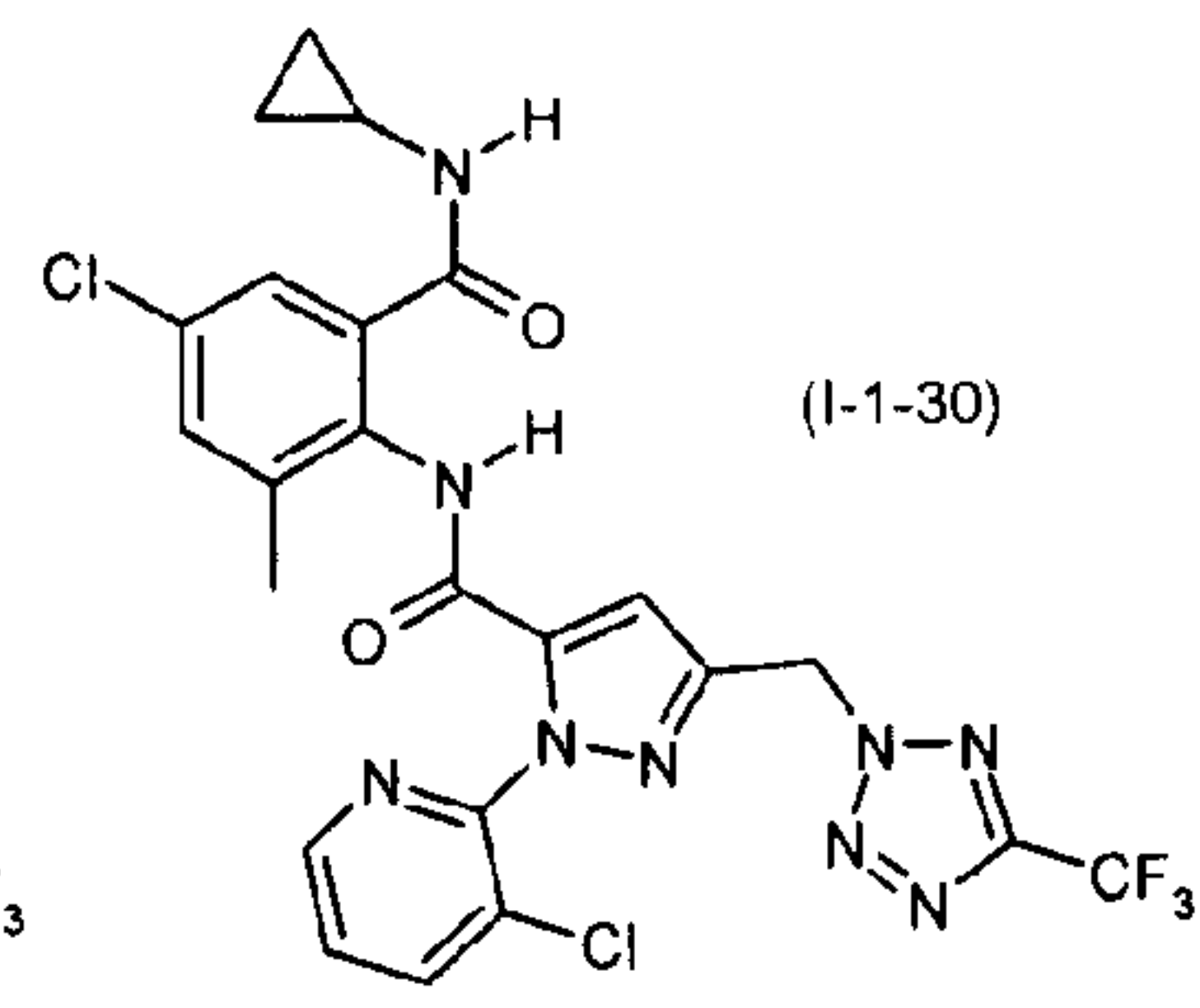
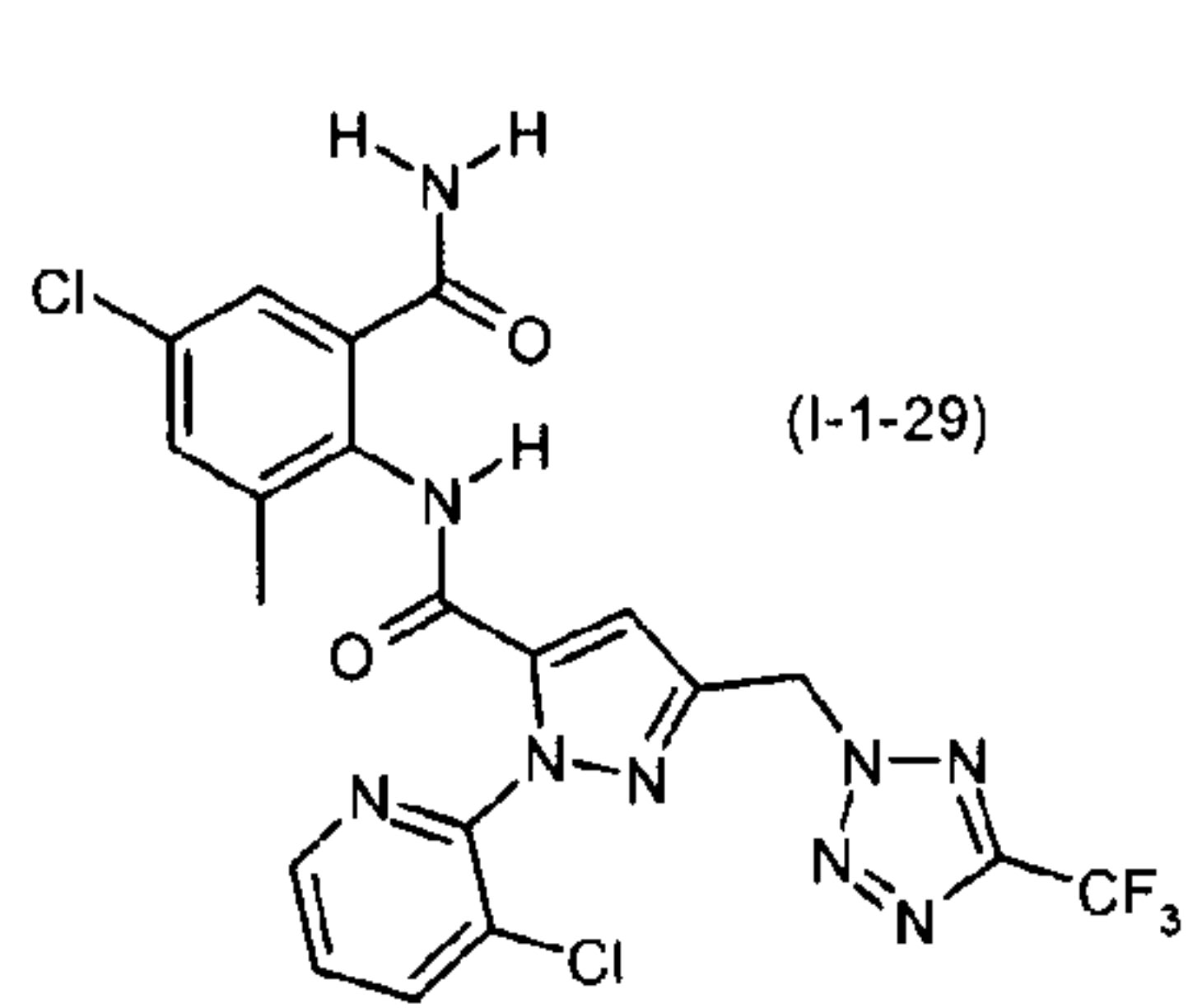
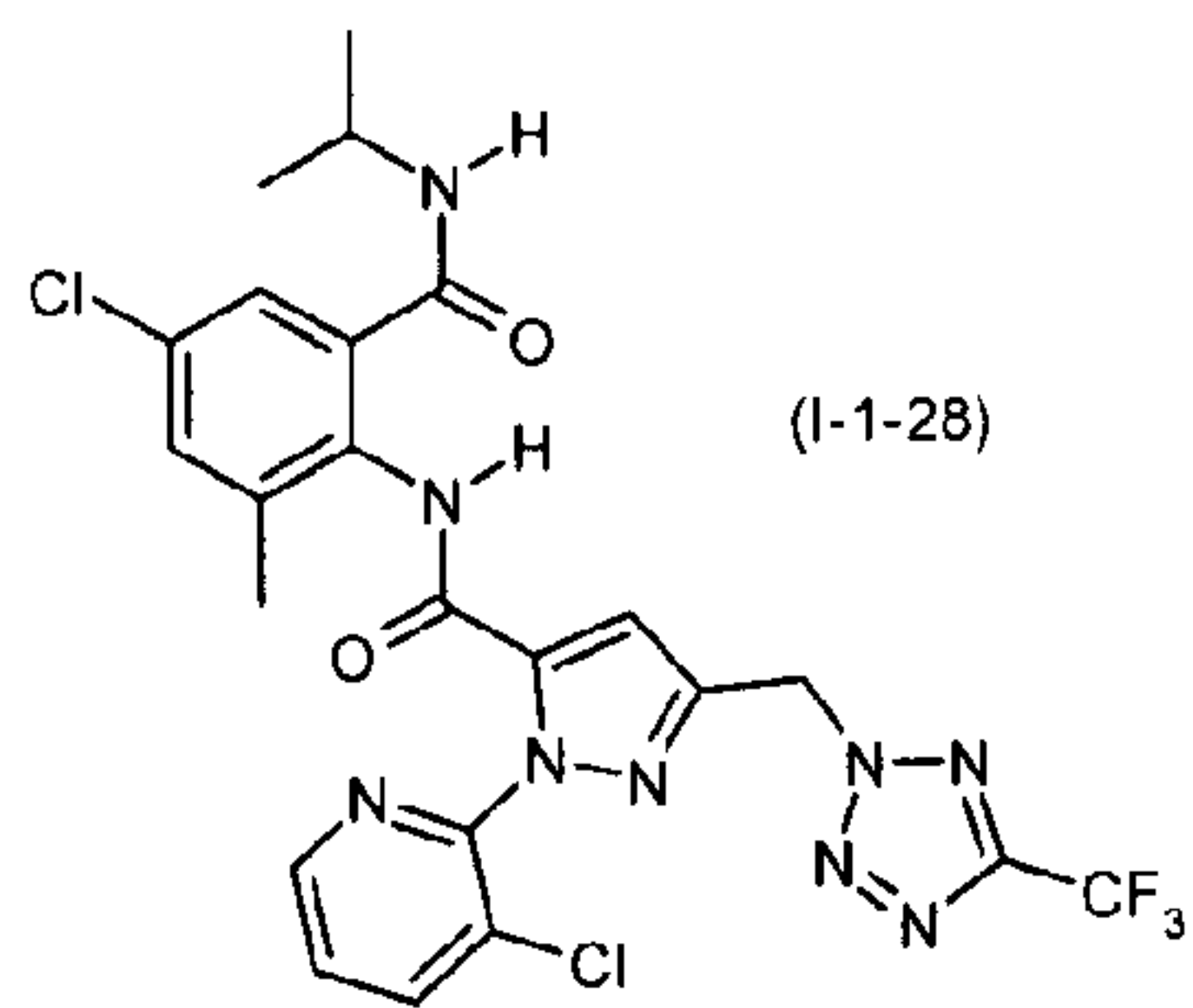
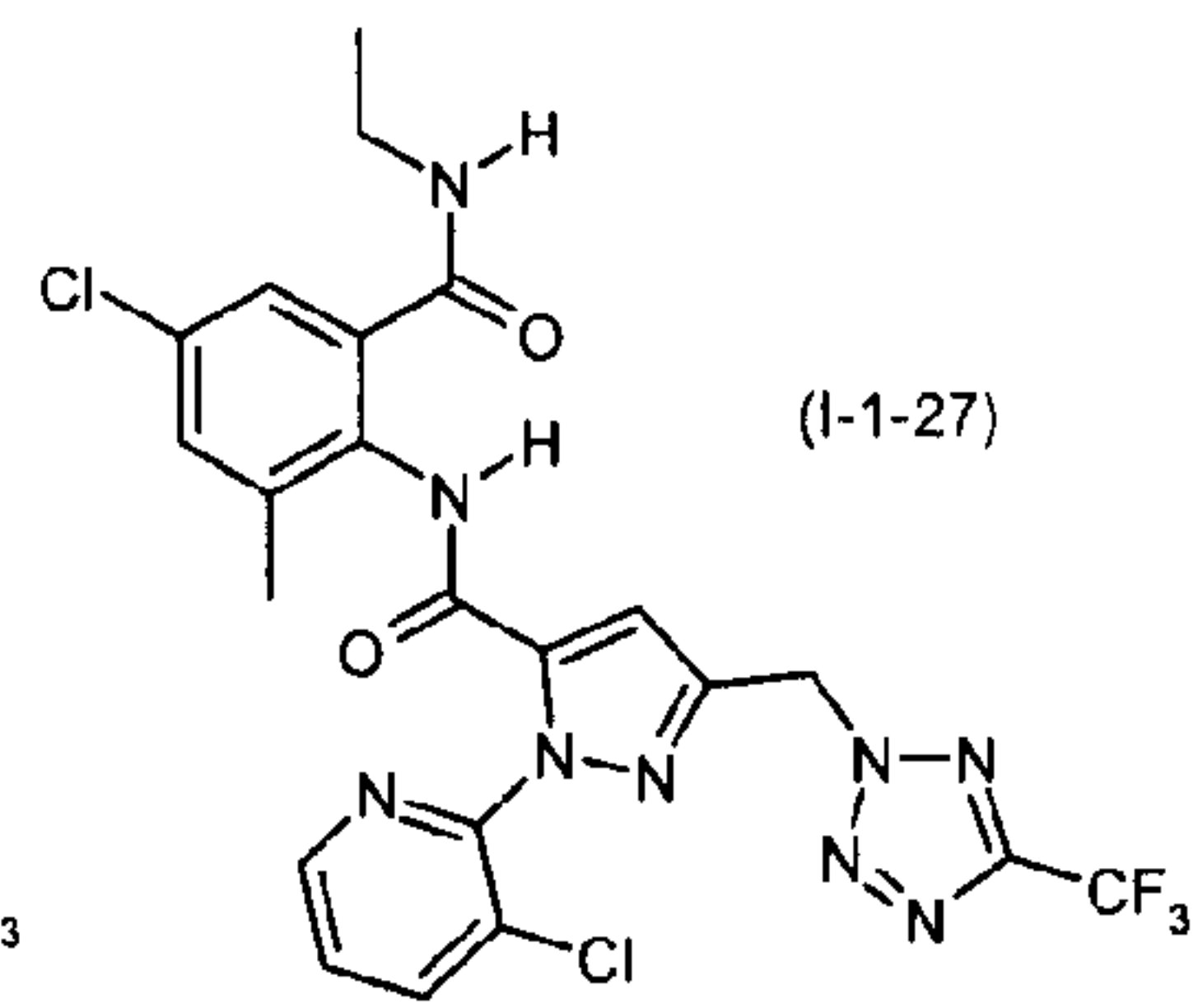
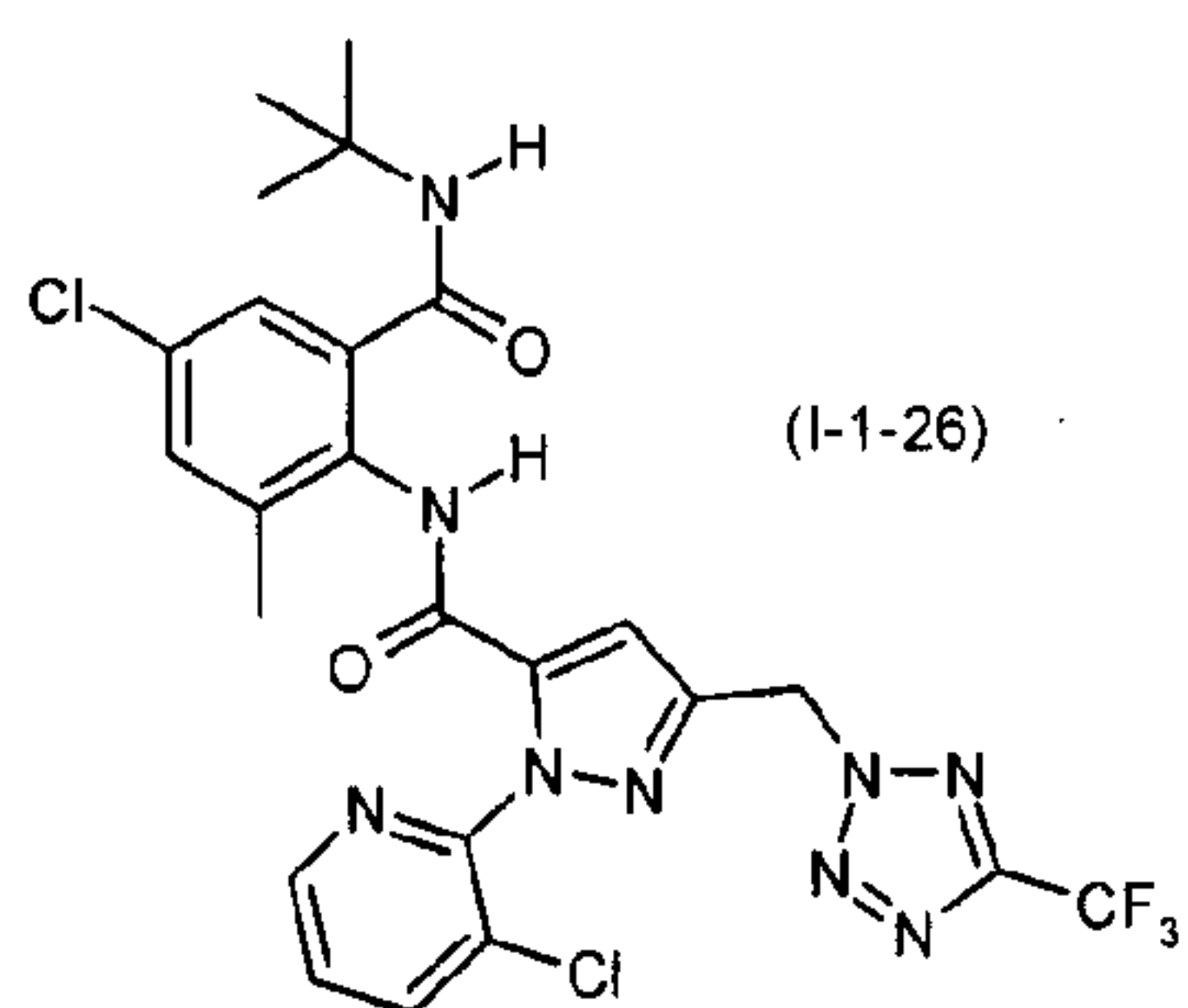
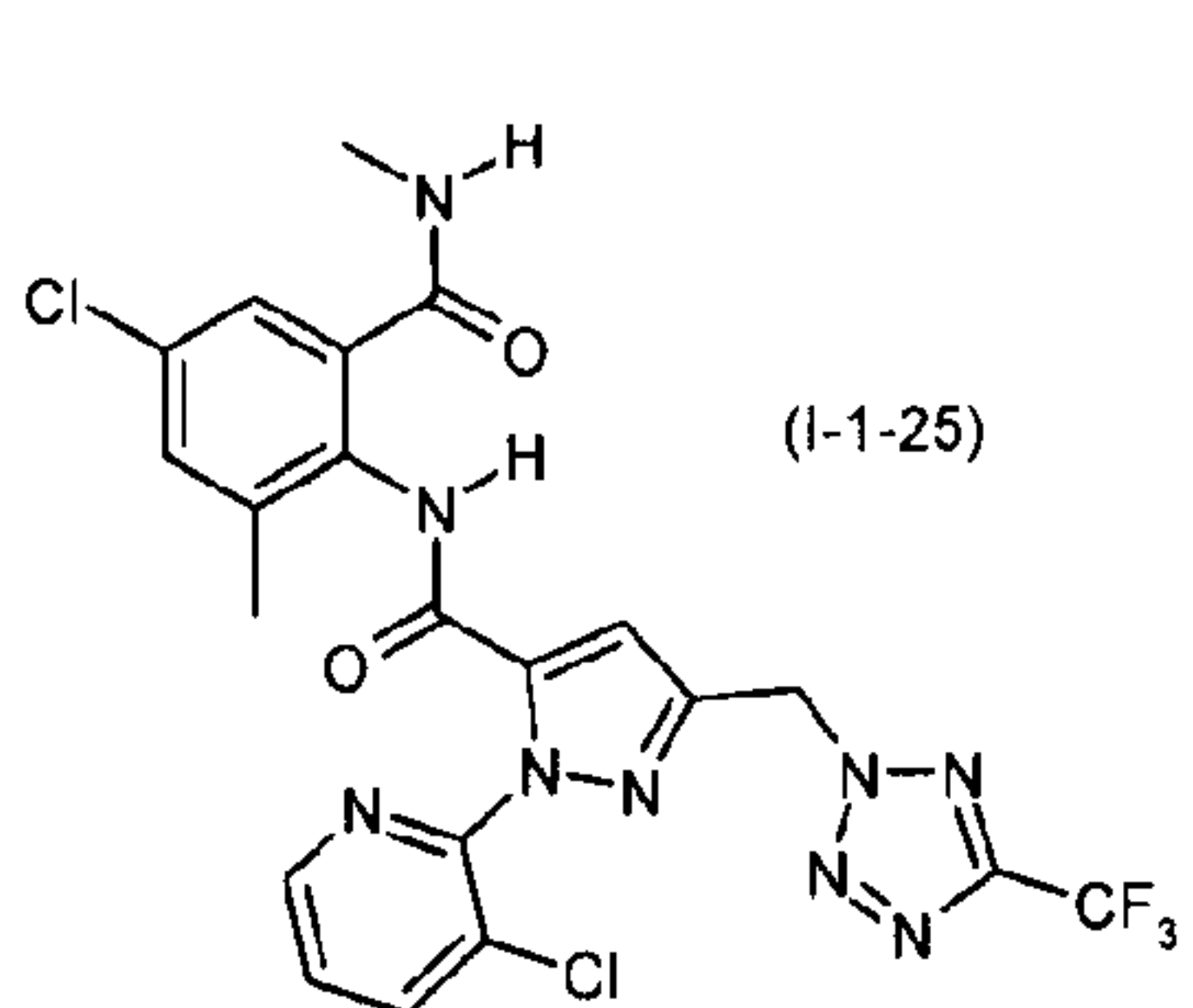
Additionally likewise more preferred are active ingredient combinations comprising at least one active ingredient of the general formula (I) or (I-1) and an active ingredient from group (II) selected from

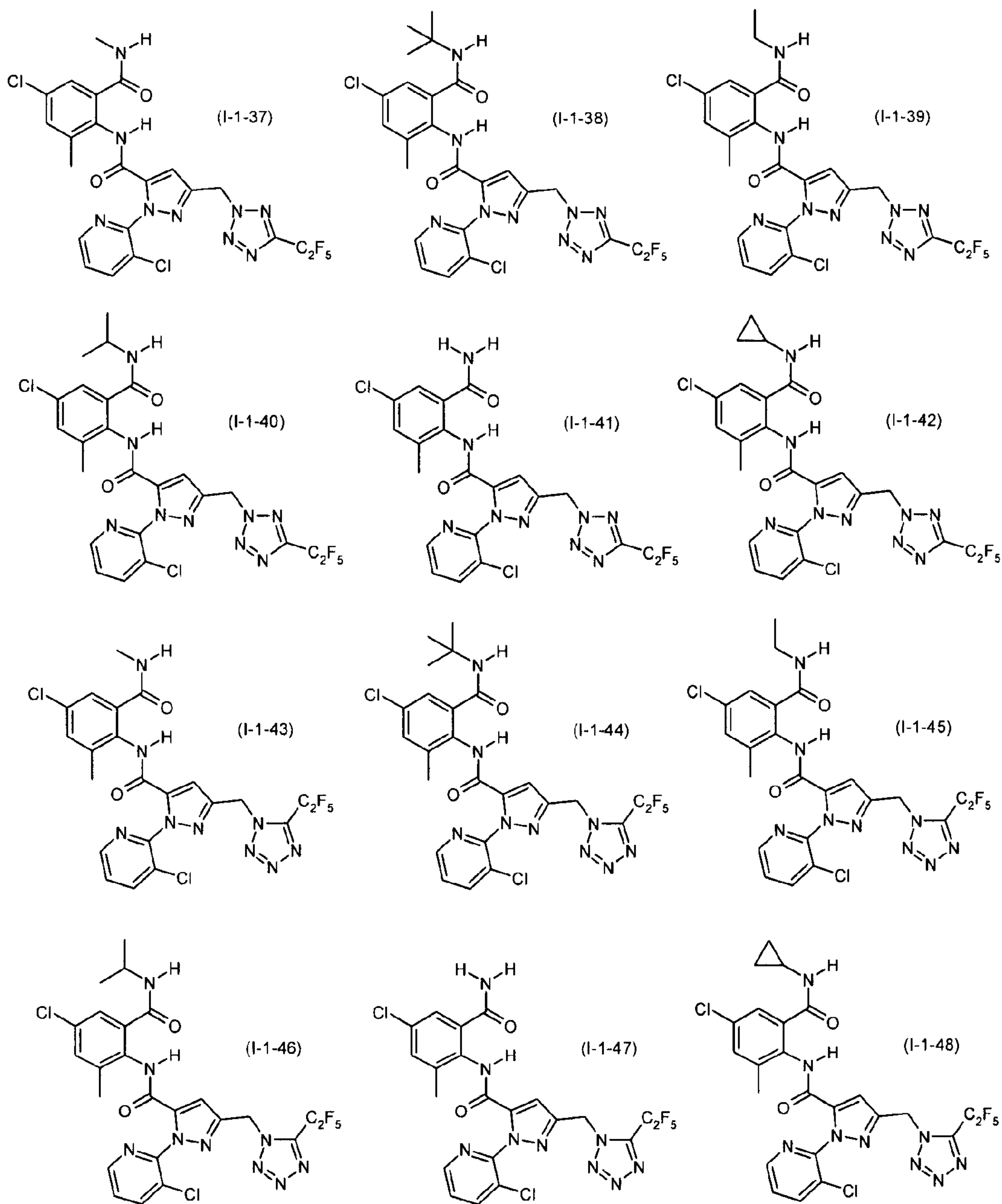
Bacillus firmus I-1582
dichloropropene
dimethoate
methomyl
imicyafos
fluensulfone
11-(4-chloro-2,6-dimethylphenyl)-12-hydroxy-1,4-dioxo-9-azadispiro[4.2.4.2]tetradec-11-en-10-one
2-{6-[2-(5-fluoropyridin-3-yl)-1,3-thiazol-5-yl]pyridin-2-yl}pyrimidine

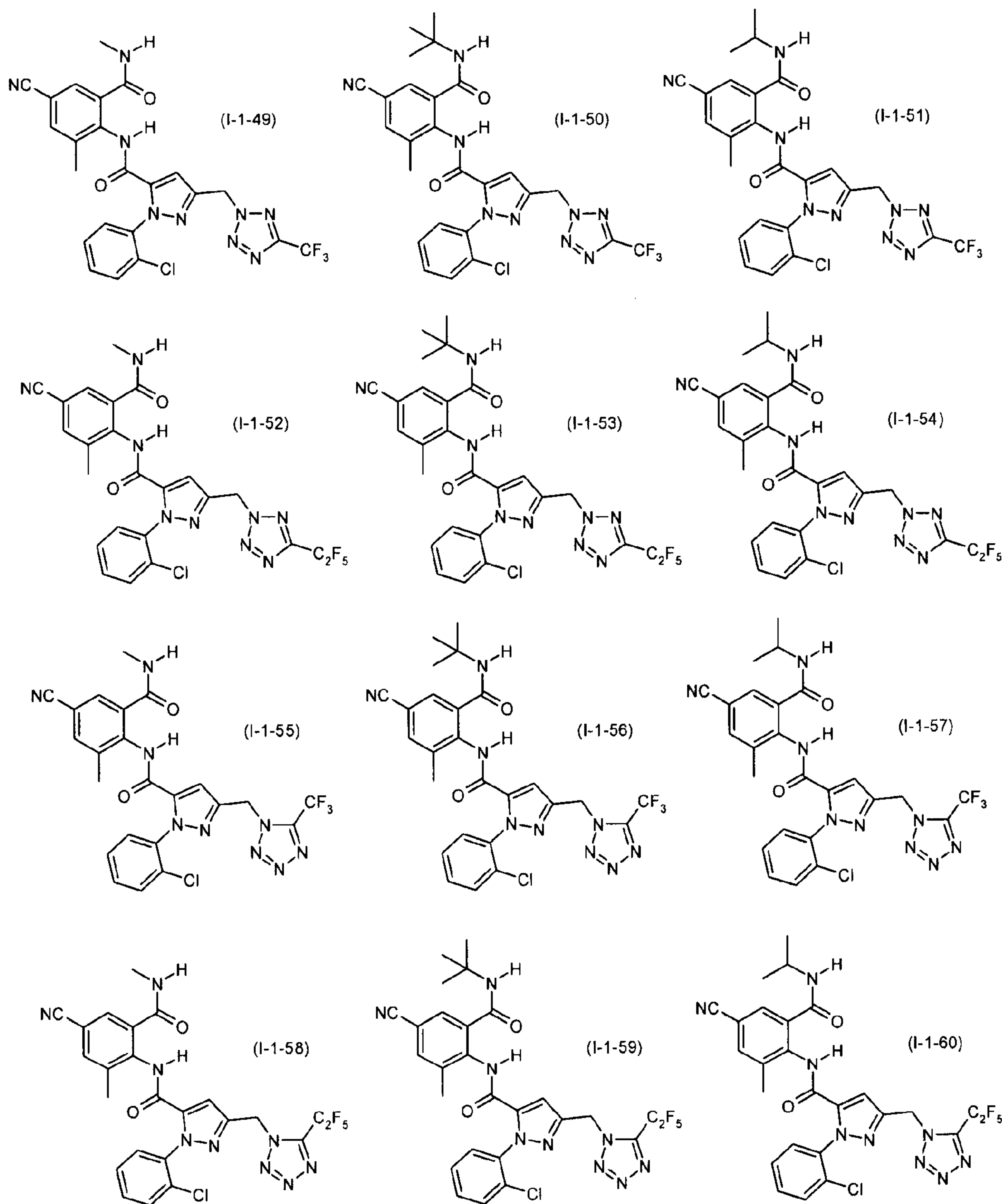
Even more preferred active ingredient combinations comprise exactly one active ingredient of the formula (I-1-1) to (I-1-60) and one or more active ingredients from group (II).











Additionally even more preferred active ingredient combinations comprise the mixtures of active ingredients of the formula (I-1-1) to (I-1-60) and one or more active ingredients from group (II) specified hereinafter.

These mixtures are present preferably in a mixing ratio of 80:20 to 99:1. Mention should be made by way of example of the mixture I-1-1/I-1-7, the compound of the formula I-1-1 being present relative to the compound of the formula I-1-7 in a mixing ratio of 80:20 to 99:1. Mention should likewise be made

5 by way of example of the mixture 1-1-2/ 1-1-8, the compound of the formula I-1-2 being present relative

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to the compound of the formula I-1-8 in a mixing ratio of 80:20 to 99:1.

I-1-1/I-1-7,

I-1-2/I-1-8,

I-1-3/I-1-9,

5 I-1-4/I-1-10,

I-1-5/I-1-11,

I-1-6/I-1-12,

I-1-13/I-1-1-19,

I-1-14/I-1-20,

10 I-1-15/I-1-21,

I-1-16/I-1-22,

I-1-17/I-1-23,

I-1-18/I-1-24,

I-1-25/I-1-31,

15 I-1-26/I-1-32,

I-1-27/I-1-33,

I-1-28/I-1-34,

I-1-29/I-1-35,

I-1-30/I-1-36,

20 I-1-37/I-1-43,

I-1-38/I-1-44,

I-1-39/I-1-45,

I-1-40/I-1-46,

I-1-41/I-1-47,

I-1-42/I-1-48,

I-1-49/I-1-55,

I-1-50/I-1-56,

5 I-1-51/I-1-57,

I-1-52/I-1-58,

I-1-53/I-1-59,

I-1-54/I-1-60.

10 Especially preferred are combinations comprising the active ingredient (I-1-1) and exactly one active ingredient from group II in the mixing ratios specified in Table 1.

Especially preferred are combinations comprising the active ingredient (I-1-2) and exactly one active ingredient from group II in the mixing ratios specified in Table 1.

Especially preferred are combinations comprising the active ingredient (I-1-3) and exactly one active ingredient from group II in the mixing ratios specified in Table 1.

Especially preferred are combinations comprising the active ingredient (I-1-4) and exactly one active ingredient from group II in the mixing ratios specified in Table 1.

Especially preferred are combinations comprising the active ingredient (I-1-5) and exactly one active ingredient from group II in the mixing ratios specified in Table 1.

Especially preferred are combinations comprising the active ingredient (I-1-6) and exactly one active ingredient from group II in the mixing ratios specified in Table 1.

Especially preferred are combinations comprising the active ingredient (I-1-7) and exactly one active ingredient from group II in the mixing ratios specified in Table 1.

Especially preferred are combinations comprising the active ingredient (I-1-8) and exactly one active ingredient from group II in the mixing ratios specified in Table 1.

Especially preferred are combinations comprising the active ingredient (I-1-9) and exactly one active ingredient from group II in the mixing ratios specified in Table 1.

Especially preferred are combinations comprising the active ingredient (I-1-10) and exactly one active ingredient from group II in the mixing ratios specified in Table 1.

Especially preferred are combinations comprising the active ingredient (I-1-11) and exactly one active ingredient from group II in the mixing ratios specified in Table 1.

Especially preferred are combinations comprising the active ingredient (I-1-12) and exactly one active

ingredient from group II in the mixing ratios specified in Table 1.

Especially preferred are combinations comprising the active ingredient (I-1-49) and exactly one active ingredient from group II in the mixing ratios specified in Table 1.

Especially preferred are combinations comprising the active ingredient (I-1-50) and exactly one active ingredient from group II in the mixing ratios specified in Table 1.

Especially preferred are combinations comprising the active ingredient (I-1-51) and exactly one active ingredient from group II in the mixing ratios specified in Table 1.

Especially preferred are combinations comprising the active ingredient (I-1-52) and exactly one active ingredient from group II in the mixing ratios specified in Table 1.

Especially preferred are combinations comprising the active ingredient (I-1-53) and exactly one active ingredient from group II in the mixing ratios specified in Table 1.

Especially preferred are combinations comprising the active ingredient (I-1-54) and exactly one active ingredient from group II in the mixing ratios specified in Table 1.

Especially preferred are combinations comprising the active ingredient (I-1-55) and exactly one active ingredient from group II in the mixing ratios specified in Table 1.

Especially preferred are combinations comprising the active ingredient (I-1-56) and exactly one active ingredient from group II in the mixing ratios specified in Table 1.

Especially preferred are combinations comprising the active ingredient (I-1-57) and exactly one active ingredient from group II in the mixing ratios specified in Table 1.

Especially preferred are combinations comprising the active ingredient (I-1-58) and exactly one active ingredient from group II in the mixing ratios specified in Table 1.

Especially preferred are combinations comprising the active ingredient (I-1-59) and exactly one active ingredient from group II in the mixing ratios specified in Table 1.

Especially preferred are combinations comprising the active ingredient (I-1-60) and exactly one active ingredient from group II in the mixing ratios specified in Table 1.

The active ingredient combinations may additionally also comprise further fungicidally, acaricidally or insecticidally active mixture components.

When the active ingredients are present in particular weight ratios in the inventive active ingredient combinations, the improved effect is manifested. However, the weight ratios of the active ingredients in the active ingredient combinations can be varied within a relatively wide range. In general, the inventive combinations comprise active ingredients of the formula (I) to the mixing partner from group (II) in a ratio of 625:1 to 1: 625; preferably in the preferred and more preferred mixing ratios specified in Table 1 below:

- the mixing ratios are based on weight ratios. The ratio should be understood as the active ingredient of the formula (I):mixing partner to active ingredient of the formula (I):mixing partner.

	Mixing partner	Preferred mixing ratio	More preferred mixing ratio	Most preferred mixing ratio
1.	acrinathrin	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
2.	alpha-cypermethrin	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
3.	betacyfluthrin	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
4.	cyhalothrin	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
5.	cypermethrin	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
6.	deltamethrin	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
7.	esfenvalerate	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
8.	etofenprox	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
9.	fenpropathrin	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
10.	fenvalerate	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
11.	flucythrinate	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
12.a	lambda-cyhalothrin	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
12.b	gamma-cyhalothrin	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
13.	permethrin	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
14.	tau-fluvalinate	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
15.	transfluthrin	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
16.	zeta-cypermethrin	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
17.	cyfluthrin	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
18.	bifenthrin	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
19.	tefluthrin	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
20.	eflusalinate	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
21.	fubfenprox	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
22.	pyrethrin	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
23.	resmethrin	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
24.	imidacloprid	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
25.	acetamiprid	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
26.	thiamethoxam	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
27.	nitenpyram	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
28.	thiacloprid	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
29.	dinotefuran	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
30.	clothianidin	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
31.	imidaclothiz	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5

	Mixing partner	Preferred mixing ratio	More preferred mixing ratio	Most preferred mixing ratio
32.	chlorfluazuron	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
33.	diflubenzuron	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
34.	lufenuron	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
35.	teflubenzuron	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
36.	triflumuron	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
37.	novaluron	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
38.	flufenoxuron	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
39.	hexaflumuron	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
40.	bistrifluoron	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
41.	noviflumuron	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
42.	buprofezin	625:1 to 1:625	125:1 to 1:125	25:1 to 1:25
43.	cyromazine	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
44.	methoxyfenozide	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
45.	tebufenozide	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
46.	halofenozide	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
48.	chromafenozide	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
49.	endosulfan	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
50.	fipronil	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
51.	ethiprole	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
52.	pyrafluprole	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
53.	pyriprole	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
54.	flubendiamide	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
55.	chlorantraniliprole (Rynaxypyr)	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
56.	cyazypyr	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
57.	emamectin	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
58.	emamectin benzoate	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
59.	abamectin	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
60.	ivermectin	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
61.	milbemectin	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
62.	lepimectin	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
63.	tebufenpyrad	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
64.	fenpyroximate	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
65.	pyridaben	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
66.	fenazaquin	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5

	Mixing partner	Preferred mixing ratio	More preferred mixing ratio	Most preferred mixing ratio
67.	pyrimidifen	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
68.	tolfenpyrad	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
69.	dicofol	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
70.	cyenopyrafen	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
71.	cyflumetofen	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
72.	acequinocyl	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
73.	fluacrypyrin	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
74.	bifenazate	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
75.	diafenthiuron	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
76.	etoxazole	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
77.	clofentezine	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
78.	spinosad	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
79.	triarathen	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
80.	tetradifon	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
81.	propargite	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
82.	hexythiazox	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
83.	bromopropylate	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
84.	chinomethionat	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
85.	amitraz	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
86.	pyrifluquinazone	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
87.	pymetrozine	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
88.	flonicamid	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
89.	pyriproxyfen	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
90.	diofenolan	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
91.	chlorfenapyr	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
92.	metaflumizone	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
93.	indoxacarb	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
94.	chlorpyrifos	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
95.	spirodiclofen	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
96.	spiromesifen	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
97.	spirotetramat	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
98.	pyridalyl	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
99.	spinetoram	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
100.	acephate	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5

	Mixing partner	Preferred mixing ratio	More preferred mixing ratio	Most preferred mixing ratio
101.	triazophos	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
102.	profenofos	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
103.	fenamiphos	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
104.	4-[[[6-chloropyrid-3-yl)methyl](2,2-difluoroethyl)amino}-furan-2(5H)-one	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
105.	cadusaphos	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
106.	carbaryl	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
107.	carbofuran	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
108.	ethoprophos	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
109.	thiodicarb	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
110.	aldicarb	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
111.	metamidophos	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
112.	methiocarb	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
113.	sulfoxaflor	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
114.	imicyafos	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
115.	fluensulfone	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
116.	Bacillus firmus I-1582	500:1 to 1:500	125:1 to 1:125	25:1 to 1:25
117.	11-(4-chloro-2,6-dimethylphenyl)-12-hydroxy-1,4-dioxo-9-azadispiro[4.2.4.2]tetradec-11-en-10-one	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5
118.	2-{6-[2-(5-fluoropyridin-3-yl)-1,3-thiazol-5-yl]pyridin-2-yl}pyrimidine	125:1 to 1:125	25:1 to 1:25	5:1 to 1:5

The inventive active ingredient combinations, given good plant tolerance, favourable homeotherm toxicity and good environmental compatibility, are suitable for protecting plants and plant organs, for increasing harvest yields, for improving the quality of the harvested material and for controlling animal pests, especially insects, arachnids, helminths, nematodes and molluscs, which are encountered in agriculture, in horticulture, in animal husbandry, in forests, in gardens and leisure facilities, in the protection of stored products and of materials, and in the hygiene sector. They can preferably be used as crop protection compositions. They are active against normally sensitive and resistant species and against all or some stages of development. The abovementioned pests include:

From the order of the Anoplura (Phthiraptera), for example, *Damalinia* spp., *Haematopinus* spp., *Linognathus* spp., *Pediculus* spp., *Trichodectes* spp.

- From the class of the Arachnida, for example, *Acarus* spp., *Aceria sheldoni*, *Aculops* spp., *Aculus* spp., *Amblyomma* spp., *Amphitetranychus viennensis*, *Argas* spp., *Boophilus* spp., *Brevipalpus* spp., *Bryobia* *praetiosa*, *Chorioptes* spp., *Dermanyssus gallinae*, *Eotetranychus* spp., *Epitrimerus pyri*, *Eutetranychus* spp., *Eriophyes* spp., *Halotydeus destructor*, *Hemitarsonemus* spp., *Hyalomma* spp., *Ixodes* spp., *Latrodectus mactans*, *Metatetranychus* spp., *Nuphessa* spp., *Oligonychus* spp., *Ornithodoros* spp., *Panonychus* spp., *Phyllocoptruta oleivora*, *Polyphagotarsonemus latus*, *Psoroptes* spp., *Rhipicephalus* spp., *Rhizoglyphus* spp., *Sarcoptes* spp., *Scorpio maurus*, *Stenotarsonemus* spp., *Tarsonemus* spp., *Tetranychus* spp., *Vasates lycopersici*.

From the class of the Bivalva, for example, *Dreissena* spp.

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

- From the order of the Coleoptera, for example, *Acalymma vittatum*, *Acanthoscelides obtectus*, *Adoretus* spp., *Agelastica alni*, *Agriotes* spp., *Amphimallon solstitialis*, *Anobium punctatum*, *Anoplophora* spp., *Anthonomus* spp., *Anthrenus* spp., *Apion* spp., *Apogonia* spp., *Atomaria* spp., *Attagenus* spp., *Bruchidius obtectus*, *Bruchus* spp., *Cassida* spp., *Cerotoma trifurcata*, *Ceutorrhynchus* spp., *Chaetocnema* spp., *Cleonus mendicus*, *Conoderus* spp., *Cosmopolites* spp., *Costelytra zealandica*, *Ctenicera* spp., *Curculio* spp., *Cryptorhynchus lapathi*, *Cylindrocopturus* spp., *Dermestes* spp., *Diabrotica* spp., *Dichocrocis* spp., *Diloboderus* spp., *Epilachna* spp., *Epitrix* spp., *Faustinus* spp., *Gibbium psylloides*, *Hellula undalis*, *Heteronychus arator*, *Heteronyx* spp., *Hylamorpha elegans*, *Hylotrupes bajulus*, *Hypera postica*, *Hypothenemus* spp., *Lachnosterna consanguinea*, *Lema* spp., *Leptinotarsa decemlineata*, *Leucoptera* spp., *Lissorhoptrus oryzophilus*, *Lixus* spp., *Luperodes* spp., *Lyctus* spp., *Megascelis* spp., *Melanotus* spp., *Meligethes aeneus*, *Melolontha* spp., *Migdolus* spp., *Monochamus* spp., *Naupactus xanthographus*, *Niptus hololeucus*, *Oryctes rhinoceros*, *Oryzaephilus surinamensis*, *Oryzaphagus oryzae*, *Otiorrhynchus* spp., *Oxycetonia jucunda*, *Phaedon cochleariae*, *Phyllophaga* spp., *Phyllotreta* spp., *Popillia japonica*, *Premnotrypes* spp., *Psylliodes* spp., *Ptinus* spp., *Rhizobius ventralis*, *Rhizopertha dominica*, *Sitophilus* spp., *Sphenophorus* spp., *Sternechus* spp., *Symphyletes* spp., *Tanymecus* spp., *Tenebrio molitor*, *Tribolium* spp., *Trogoderma* spp., *Tychius* spp., *Xylotrechus* spp., *Zabrus* spp.

- From the order of the Collembola, for example, *Onychiurus armatus*.

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

- From the order of the Diptera, for example, *Aedes* spp., *Agromyza* spp., *Anastrepha* spp., *Anopheles* spp., *Asphondylia* spp., *Bactrocera* spp., *Bibio hortulanus*, *Calliphora erythrocephala*, *Ceratitis capitata*, *Chironomus* spp., *Chrysomyia* spp., *Cochliomyia* spp., *Contarinia* spp., *Cordylobia anthropophaga*, *Culex* spp., *Cuterebra* spp., *Dacus oleae*, *Dasyneura* spp., *Delia* spp., *Dermatobia hominis*, *Drosophila* spp., *Echinocnemus* spp., *Fannia* spp., *Gastrophilus* spp., *Hydrellia* spp., *Hylemyia* spp., *Hyppobosca*

spp., Hypoderma spp., Liriomyza spp. Lucilia spp., Musca spp., Nezara spp., Oestrus spp., Oscinella frit, Pegomyia spp., Phorbia spp., Prodiplosis spp., Psila rosae, Rhagoletis spp., Stomoxys spp., Tabanus spp., Tannia spp., Tetanops spp., Tipula spp.

From the class of the Gastropoda, for example, Arion spp., Biomphalaria spp., Bulinus spp., Deroceras spp., Galba spp., Lymnaea spp., Oncomelania spp., Pomacea spp., Succinea spp.

From the class of the helminths, for example, Ancylostoma duodenale, Ancylostoma ceylanicum, Ancylostoma braziliensis, Ancylostoma spp., Ascaris lubricoides, Ascaris spp., Brugia malayi, Brugia timori, Bunostomum spp., Chabertia spp., Clonorchis spp., Cooperia spp., Dicrocoelium spp., Dictyocaulus filaria, Diphyllbothrium latum, Dracunculus medinensis, Echinococcus granulosus, Echinococcus multilocularis, Enterobius vermicularis, Faciola spp., Haemonchus spp., Heterakis spp., Hymenolepis nana, Hyostrogylus spp., Loa Loa, Nematodirus spp., Oesophagostomum spp., Opisthorchis spp., Onchocerca volvulus, Ostertagia spp., Paragonimus spp., Schistosoma spp., Strongyloides fuelleborni, Strongyloides stercoralis, Strongyloides spp., Taenia saginata, Taenia solium, Trichinella spiralis, Trichinella nativa, Trichinella britovi, Trichinella nelsoni, Trichinella pseudopsiralis, Trichostrongylus spp., Trichuris trichuria, Wuchereria bancrofti.

It is also possible to control protozoa, such as Eimeria.

From the order of the Heteroptera, for example, Anasa tristis, Antestiopsis spp., Blissus spp., Calocoris spp., Campylomma livida, Cavalerius spp., Cimex spp., Collaria spp., Creontiades dilutus, Dasynus piperis, Dichelops furcatus, Diconocoris hewetti, Dysdercus spp., Euschistus spp., Eurygaster spp., Heliopeltis spp., Horcias nobilellus, Leptocoris spp., Leptoglossus phyllopus, Lygus spp., Macrops excavatus, Miridae, Monalonion atratum, Nezara spp., Oebalus spp., Pentomidae, Piesma quadrata, Piezodorus spp., Psallus spp., Pseudacysta perseae, Rhodnius spp., Sahlbergella singularis, Scaptocoris castanea, Scotinophora spp., Stephanitis nashi, Tibraca spp., Triatoma spp.

From the order of the Homoptera, for example, Acyrthosiphon spp., Acrogonia spp., Aeneolamia spp., Agonosцена spp., Aleurodes spp., Aleurolobus barodensis, Aleurothrixus spp., Amrasca spp., Anuraphis cardui, Aonidiella spp., Aphanostigma piri, Aphis spp., Arboridia apicalis, Aspidiella spp., Aspidiotus spp., Atanus spp., Aulacorthum solani, Bemisia spp., Brachycaudus helichrysi, Brachycolus spp., Brevicoryne brassicae, Calligypona marginata, Carneiocephala fulgida, Ceratovacuna lanigera, Cercopidae, Ceroplastes spp., Chaetosiphon fragaefolii, Chionaspis tegalensis, Chlorita onukii, Chromaphis juglandicola, Chrysomphalus ficus, Cicadulina mbila, Coccomytilus halli, Coccus spp., Cryptomyzus ribis, Dalbulus spp., Dialeurodes spp., Diaphorina spp., Diaspis spp., Drosicha spp., Dysaphis spp., Dysmicoccus spp., Empoasca spp., Eriosoma spp., Erythroneura spp., Euscelis bilobatus, Ferrisia spp., Geococcus coffeae, Hieroglyphus spp., Homalodisca coagulata, Hyalopterus arundinis, Icerya spp., Idiocerus spp., Idioscopus spp., Laodelphax striatellus, Lecanium spp., Lepidosaphes spp., Lipaphis erysimi, Macrosiphum spp., Mahanarva spp., Melanaphis sacchari, Metcalfiella spp., Metopolophium dirhodum, Monellia costalis, Monelliopsis pecanis, Myzus spp., Nasonovia ribisnigri,

- Nephotettix spp., Nilaparvata lugens, Oncometopia spp., Orthezia praelonga, Parabemisia myricae, Paratrioza spp., Parlatoria spp., Pemphigus spp., Peregrinus maidis, Phenacoccus spp., Phloeomyzus passerinii, Phorodon humuli, Phylloxera spp., Pinnaspis aspidistrae, Planococcus spp., Protopulvinaria pyriformis, Pseudaulacaspis pentagona, Pseudococcus spp., Psylla spp., Pteromalus spp., Pyrilla spp.,
- 5 Quadraspidiotus spp., Quesada gigas, Rastrococcus spp., Rhopalosiphum spp., Saissetia spp., Scaphoides titanus, Schizaphis graminum, Selenaspidus articulatus, Sogata spp., Sogatella furcifera, Sogatodes spp., Stictocephala festina, Tenalaphara malayensis, Tinocallis caryaefoliae, Tomaspis spp., Toxoptera spp., Trialeurodes spp., Trioza spp., Typhlocyba spp., Unaspis spp., Viteus vitifolii, Zygina spp.
- 10 From the order of the Hymenoptera, for example, Athalia spp., Diprion spp., Hoplocampa spp., Lasius spp., Monomorium pharaonis, Vespa spp..
- From the order of the Isopoda, for example, Armadillidium vulgare, Oniscus asellus and Porcellio scaber.
- From the order of the Isoptera, for example, Acromyrmex spp., Atta spp., Cornitermes cumulans,
- 15 Microtermes obesi, Odontotermes spp., Reticulitermes spp.
- From the order of the Lepidoptera, for example, Acronicta major, Adoxophyes spp., Aedia leucomelas, Agrotis spp., Alabama spp., Amyelois transitella, Anarsia spp., Anticarsia spp., Argyroploce spp., Barathra brassicae, Borbo cinnara, Bucculatrix thurberiella, Bupalus piniarius, Busseola spp., Cacoecia spp., Caloptilia theivora, Capua reticulana, Carpocapsa pomonella, Carposina niponensis, Cheimatomia
- 20 brumata, Chilo spp., Choristoneura spp., Clysia ambiguella, Cnaphalocerus spp., Cnephasia spp., Conopomorpha spp., Conotrachelus spp., Copitarsia spp., Cydia spp., Dalaca noctuides, Diaphania spp., Diatraea saccharalis, Earias spp., Ecdytolopha aurantium, Elasmopalpus lignosellus, Eldana saccharina, Ephestia kuehniella, Epinotia spp., Epiphyas postvittana, Etiella spp., Eulia spp., Eupoecilia ambiguella, Euproctis spp., Euxoa spp., Feltia spp., Galleria mellonella, Gracillaria spp., Grapholitha spp.,
- 25 Hedylepta spp., Helicoverpa spp., Heliothis spp., Hofmannophila pseudospretella, Homoeosoma spp., Homona spp., Hyponomeuta padella, Kakivoria flavofasciata, Laphygma spp., Laspeyresia molesta, Leucinodes orbonalis, Leucoptera spp., Lithocolletis spp., Lithophane antennata, Lobesia spp., Loxagrotis albicosta, Lymantria spp., Lyonetia spp., Malacosoma neustria, Maruca testulalis, Mamestra brassicae, Mocis spp., Mythimna separata, Nymphula spp., Oiketicus spp., Oria spp., Orthaga spp.,
- 30 Ostrinia spp., Oulema oryzae, Panolis flammea, Parnara spp., Pectinophora spp., Perileucoptera spp., Phthorimaea spp., Phyllocnistis citrella, Phyllonorycter spp., Pieris spp., Platynota stultana, Plusia spp., Plutella xylostella, Prays spp., Prodenia spp., Protoparce spp., Pseudaletia spp., Pseudoplusia includens, Pyrausta nubilalis, Rachiplusia nu, Schoenobius spp., Scirpophaga spp., Scotia segetum, Sesamia spp., Sparganothis spp., Spodoptera spp., Stathmopoda spp., Stomopteryx subsecivella, Synanthedon spp.,
- 35 Tecia solanivora, Thermesia gemmatilis, Tinea pellionella, Tineola bisselliella, Tortrix spp., Trichoplusia spp., Tuta absoluta, Virachola spp.

From the order of the Orthoptera, for example, *Acheta domesticus*, *Blatta orientalis*, *Blattella germanica*, *Dichroplus* spp., *Gryllotalpa* spp., *Leucophaea maderae*, *Locusta* spp., *Melanoplus* spp., *Periplaneta americana*, *Schistocerca gregaria*.

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

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

From the order of the Thysanoptera, for example, *Anaphothrips obscurus*, *Baliothrips biformis*, *Drepanothrips reuteri*, *Enneothrips flavens*, *Frankliniella* spp., *Heliothrips* spp., *Hercinothrips femoralis*, *Rhipiphorothrips cruentatus*, *Scirtothrips* spp., *Taeniothrips cardamoni*, *Thrips* spp.

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

- 10 The phytoparasitic nematodes include, for example, *Aphelenchoides* spp., *Bursaphelenchus* spp., *Ditylenchus* spp., *Globodera* spp., *Heterodera* spp., *Longidorus* spp., *Meloidogyne* spp., *Pratylenchus* spp., *Radopholus similis*, *Trichodorus* spp., *Tylenchulus semipenetrans*, *Xiphinema* spp.

- The active ingredient combinations can be converted to the customary formulations, such as solutions, emulsions, wettable powders, suspensions, powders, dusts, pastes, soluble powders, granules, suspoemulsion concentrates, natural products impregnated with active ingredient, synthetic substances impregnated with active ingredient, and also microencapsulations in polymeric substances.
- 15

These formulations are produced in a known manner, for example by mixing the active ingredients with extenders, i.e. liquid solvents, and/or solid carriers, optionally with the use of surfactants, i.e. emulsifiers and/or dispersants, and/or foam formers.

- 20 If the extender used is water, it is also possible to use, for example, organic solvents as auxiliary solvents. Useful liquid solvents essentially include: aromatics such as xylene, toluene or alkylnaphthalenes, chlorinated aromatics and chlorinated aliphatic hydrocarbons such as chlorobenzenes, chloroethylenes or methylene chloride, aliphatic hydrocarbons such as cyclohexane or paraffins, for example mineral oil fractions, mineral and vegetable oils, alcohols such as butanol or glycol and their ethers and esters, ketones such as acetone, methyl ethyl ketone, methyl isobutyl ketone or cyclohexanone, strongly polar solvents such as dimethylformamide and dimethyl sulfoxide, and also water.
- 25

Useful solid carriers include:

- for example ammonium salts and ground natural minerals, such as kaolins, clays, talc, chalk, quartz, attapulgite, montmorillonite or diatomaceous earth, and ground synthetic minerals, such as finely divided silica, alumina and silicates; suitable solid carriers for granules are for example crushed and fractionated natural rocks, such as calcite, marble, pumice, sepiolite, dolomite and synthetic granules of inorganic and organic meals, and granules of organic material, such as sawdust, coconut shells, maize
- 30

cobs and tobacco stalks; suitable emulsifiers and/or foam formers are for example nonionic and anionic emulsifiers, such as polyoxyethylene fatty acid esters, polyoxyethylene fatty alcohol ethers, for example alkylaryl polyglycol ethers, alkylsulphonates, alkyl sulphates, arylsulphonates and protein hydrolysates; suitable dispersants are for example lignosulphite waste liquors and methylcellulose.

- 5 In the formulations it is possible to use tackifiers such as carboxymethylcellulose, natural and synthetic polymers in the form of powders, granules or latices, such as gum arabic, polyvinyl alcohol and polyvinyl acetate, or else natural phospholipids such as cephalins and lecithins and synthetic phospholipids. Further additives may be mineral and vegetable oils.

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

The formulations contain generally between 0.1 and 95% by weight of active ingredient, preferably between 0.5 and 90%.

- 15 The inventive active ingredient combinations may be present in commercially available formulations and in the use forms, prepared from these formulations, as a mixture with other active ingredients, such as insecticides, attractants, sterilants, bactericides, acaricides, nematocides, fungicides, growth regulators or herbicides. The insecticides include, for example, phosphoric esters, carbamates, carboxylic esters, chlorinated hydrocarbons, phenylureas, substances produced by microorganisms, etc.

- 20 A mixture with other known active ingredients, such as herbicides, or with fertilizers and growth regulators, is also possible.

When used as insecticides, the inventive active ingredient combinations may also be present in their commercially available formulations and in the use forms, prepared from these formulations, as a mixture with synergists. Synergists are compounds which enhance the action of the active ingredients, without any need for the synergist added to be active itself.

- 25 The active ingredient content of the use forms prepared from the commercially available formulations may vary within wide limits. The active ingredient concentration of the application forms may be from 0.0000001 to 95% by weight of active ingredient, preferably between 0.0001 and 1% by weight.

The compounds are applied in a customary manner appropriate for the use forms.

- 30 All plants and plant parts can be treated in accordance with the invention. Plants are understood here to mean all plants and plant populations, such as desired and undesired wild plants or crop plants (including naturally occurring crop plants). Crop plants may be plants which can be obtained by

conventional breeding and optimization methods or by biotechnological and genetic engineering methods or combinations of these methods, including the transgenic plants and including the plant varieties which are protectable and non-protectable by plant breeders' rights. Plant parts are understood to mean all parts and organs of plants above and below the ground, such as shoot, leaf, flower and root, examples of which include leaves, needles, stalks, stems, flowers, fruit bodies, fruits, seeds, roots, tubers and rhizomes. The plant parts also include harvested material and vegetative and generative propagation material, for example cuttings, tubers, rhizomes, slips and seeds.

The inventive treatment of the plants and plant parts with the active ingredient combinations is effected directly or by allowing them to act on the surroundings, habitat or storage space thereof by the customary treatment methods, for example by dipping, spraying, vaporizing, pouring on, nebulizing, scattering, painting on, and, in the case of propagation material, especially in the case of seeds, also by applying one or more coats.

As already mentioned above, it is possible to treat all plants and their parts in accordance with the invention. In a preferred embodiment, wild plant species and plant cultivars, or those obtained by conventional biological breeding methods, such as crossing or protoplast fusion, and also parts thereof, are treated. In a further preferred embodiment, transgenic plants and plant cultivars obtained by genetical engineering, if appropriate in combination with conventional methods (Genetically Modified Organisms), and parts thereof are treated. The term "parts" or "parts of plants" or "plant parts" has been explained above.

More preferably, plants of the plant cultivars which are each commercially available or in use are treated in accordance with the invention.

Depending on the plant species or plant cultivars, and the location and growth conditions (soils, climate, vegetation period, diet) thereof, the inventive treatment may also result in superadditive ("synergistic") effects. For example, possibilities include reduced application rates and/or broadening of the activity spectrum and/or an increase in the activity of the compounds and compositions usable in accordance with the invention, better plant growth, increased tolerance to high or low temperatures, increased tolerance to drought or to levels of water or soil salinity, enhanced flowering performance, easier harvesting, accelerated ripening, higher yields, higher quality and/or higher nutritional value of the harvested products, increased storage life and/or processibility of the harvested products, which exceed the effects normally to be expected.

The transgenic plants or plant cultivars (those obtained by genetic engineering) which are to be treated with preference in accordance with the invention include all plants which, through the genetic modification, received genetic material which imparts particular advantageous useful properties

("traits") to these plants. Examples of such properties are better plant growth, increased tolerance to high or low temperatures, increased tolerance to drought or to levels of water or soil salinity, enhanced flowering performance, easier harvesting, accelerated ripening, higher yields, higher quality and/or a higher nutritional value of the harvested products, better storage life and/or processibility of the harvested products. Further and particularly emphasized examples of such properties are an improved defence of the plants against animal and microbial pests, such as against insects, mites, phytopathogenic fungi, bacteria and/or viruses, and also increased tolerance of the plants to certain herbicidally active ingredients. Examples of transgenic plants which may be mentioned are the important crop plants, such as cereals (wheat, rice), maize, soya beans, potatoes, cotton, oilseed rape and also fruit plants (with the fruits apples, pears, citrus fruits and grapes), and particular emphasis is given to maize, soya beans, potatoes, cotton and oilseed rape. Traits that are emphasized are in particular increased defence of the plants against insects by toxins formed in the plants, in particular those formed in the plants by the genetic material from *Bacillus thuringiensis* (for example by the genes CryIA(a), CryIA(b), CryIA(c), CryIIA, CryIIIA, CryIIIB2, Cry9c Cry2Ab, Cry3Bb and CryIF and also combinations thereof) (hereinbelow referred to as "Bt plants"). Traits that are additionally particularly emphasized are the increased tolerance of the plants to certain active herbicidal ingredients, for example imidazolinones, sulphonylureas, glyphosate or phosphinothricin (for example the "PAT" gene). The genes which impart the desired traits in question may also be present in combinations with one another in the transgenic plants. Examples of "Bt plants" include maize varieties, cotton varieties, soya varieties and potato varieties which are sold under the trade names YIELD GARD® (for example maize, cotton, soya), KnockOut® (for example maize), StarLink® (for example maize), Bollgard® (cotton), Nucotn® (cotton) and NewLeaf® (potato). Examples of herbicide-tolerant plants include maize varieties, cotton varieties and soya varieties which are sold under the trade names Roundup Ready® (tolerance to glyphosate, for example maize, cotton, soya), Liberty Link® (tolerance to phosphinothricin, for example oilseed rape), IMI® (tolerance to imidazolinones) and STS® (tolerance to sulphonylureas, for example maize). Herbicide-resistant plants (plants bred in a conventional manner for herbicide tolerance) also include the varieties sold under the Clearfield® name (for example maize). Of course, these statements also apply to plant cultivars which have these genetic traits or genetic traits which are still to be developed and will be developed and/or marketed in the future.

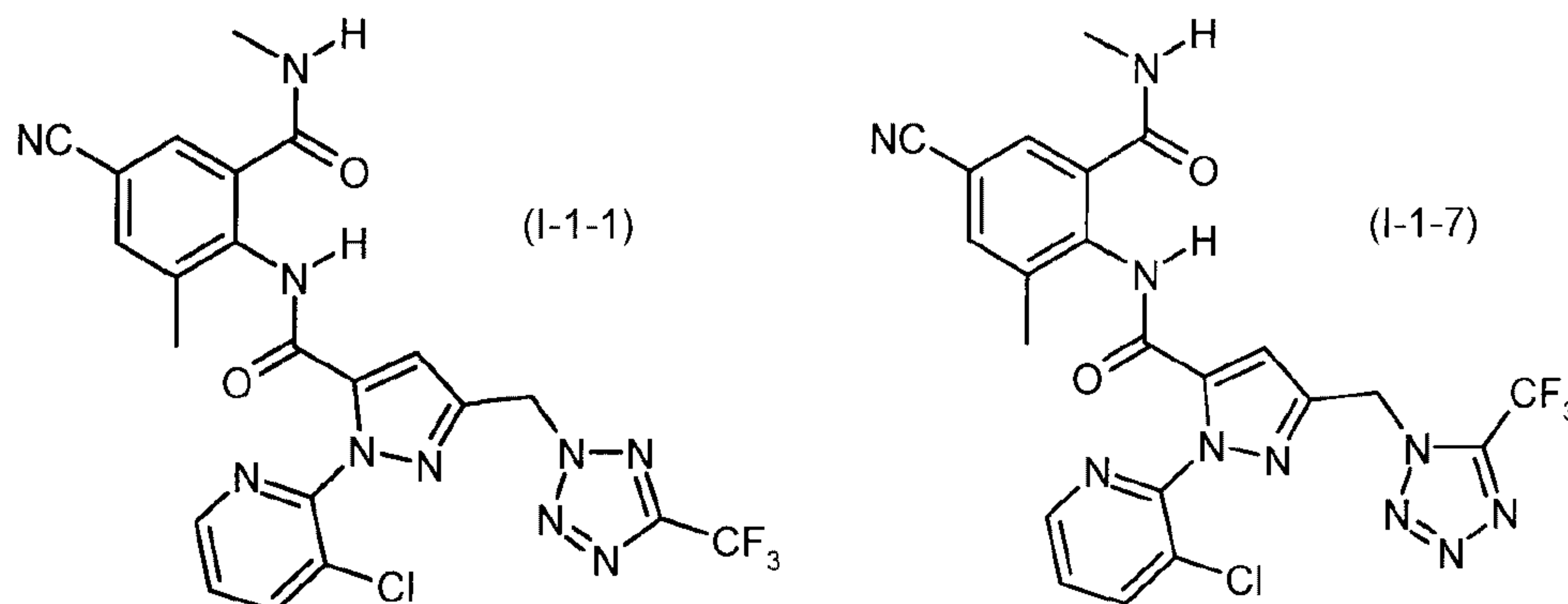
30 The plants listed can be treated according to the invention in a particularly advantageous manner with the active compound mixture according to the invention. The preferred ranges stated above for the mixtures also apply to the treatment of these plants. Particular emphasis is given to the treatment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

The good insecticidal and acaricidal action of the inventive active ingredient combinations is evident from the examples which follow. While the individual active ingredients have weaknesses in their

action, the combinations exhibit an action which exceeds a simple sum of actions.

A synergistic effect in insecticides and acaricides is present whenever the action of the active ingredient combinations is greater than the sum of the actions of the active ingredients applied individually.

The present specification discloses and claims active ingredient combinations as insecticides or
 5 acaricides comprising a synergistically active combination comprising a mixture of compounds I-1-1/I-1-7:



or salts thereof, in a ratio of 80:20 to 99:1 and one or more further insecticides and/or acaricides selected from the group consisting of: (1) Acetyl cholinesterase (AChE) inhibitors; (2) GABA-gated
 10 chloride channel antagonists; (3) Sodium channel modulators/voltage-dependent sodium channel blockers; (4) Nicotinic acetylcholine receptor agonists; (5) Allosteric acetylcholine receptor modulators or agonists; (6) chloride channel activators; (7) Juvenile hormone analogues; (8) Active ingredients with unknown or nonspecific mechanisms of action; (9) Selective antifeedants; (10) mite growth inhibitors; (11) microbial disruptors of the insect gut membrane; (12) Oxidative
 15 phosphorylation inhibitors or ATP disruptors; (13) Oxidative phosphorylation decouplers acting by interrupting the H proton gradient; (14) Nicotinic acetylcholine receptor antagonists; (15) Chitin biosynthesis inhibitors, type 0; (16) Chitin biosynthesis inhibitors, type 1; (17) Moulting disruptors; (18) Ecdysone agonists/disruptors; (19) Octopaminergic agonists; (20) Complex-III electron transport inhibitors; (21) Complex-I electron transport inhibitors; (22) Voltage-dependent sodium channel
 20 blockers; (23) Inhibitors of acetyl-CoA carboxylase; (24) Complex-IV electron transport inhibitors; (25) Complex-II electron transport inhibitors; and (26) Ryanodine receptor effectors.

- 50a -

The present specification also discloses and claims an agrochemical composition comprising such active ingredient combinations and extenders and/or surfactants.

The present specification also discloses and claims use of such active ingredient combinations or such an agrochemical composition for control of insects or arachnids.

- 5 The present specification also discloses and claims a method for controlling insects or arachnids, characterized in that active ingredient combinations or an agrochemical composition as disclosed herein is allowed to act on the insects or arachnids.

10 The present specification also discloses and claims a process for producing agrochemical compositions, characterized in that active ingredient combinations as disclosed herein are mixed with extenders and/or surfactants.

Use Examples

The expected action for a given combination of two active ingredients can be calculated according to S.R. Colby, Weeds 15 (1967), 20-22 as follows:

If

5 X is the kill rate, expressed in % of the untreated control, in the case of use of active ingredient A in an application rate of m g/ha or in a concentration of m ppm,

Y is the kill rate, expressed in % of the untreated control, in the case of use of active ingredient B in an application rate of n g/ha or in a concentration of n ppm, and

10 E is the kill rate, expressed in % of the untreated control, in the case of use of active ingredients A and B in application rates of m and n g/ha or in a concentration of m and n ppm,

then

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

If the actual kill rate is greater than that calculated, the kill rate of the combination is superadditive, which means that a synergistic effect is present. In this case, the kill rate actually observed must be
15 greater than the value calculated from the above formula for the expected kill rate (E).

Example A**Myzus persicae test**

Solvent: 78 parts by weight of acetone
1.5 parts by weight of dimethylformamide

5 Emulsifier: 0.5 part by weight of alkylaryl polyglycol ether

To produce an appropriate active ingredient formulation, 1 part by weight of active ingredient is mixed with the stated amounts of solvent and emulsifier, and the concentrate is diluted with emulsifier-containing water to the desired concentration.

10 Cabbage leaves (*Brassica oleracea*) severely infested by the green peach aphid (*Myzus persicae*) are treated by spraying with the active ingredient formulation in the desired concentration.

After the desired time, the kill in % is determined. 100 % means that all aphids have been killed; 0 % means that no aphids have been killed. The kill rates determined are entered into Colby's formula.

In this test, the following active ingredient combinations according to the present invention, for example, exhibited a synergistic enhancement in activity compared to the active ingredients applied
15 individually:

Table A – 1: **Myzus persicae** test

<u>Active ingredient</u>	<u>Concentration in g/ha</u>	<u>Kill rate in % after 1d</u>
compound (I-1-2)/compound (I-1-8)***	4 0.8 0.16 0.032	0 0 0 0
compound (I-1-1)/compound (I-1-7)***	4 0.8 0.16 0.032	80 0 0 0
abamectin	0.16	0
compound (I-1-1)/compound (I-1-7)*** + abamectin (5 : 1) inventive	0.8 + 0.16	found* calc.** 70 0
acephate	100	0
compound (I-1-2)/compound (I-1-8)*** + acephate (1 : 25) inventive	4 + 100	found* calc.** 80 0
acrinathrin	0.8	0
compound (I-1-2)/compound (I-1-8)*** + acrinathrin (1 :25)	0.032 + 0.8	found* calc.** 90 0

<u>Active ingredient</u>	<u>Concentration in g/ha</u>	<u>Kill rate in % after 1d</u>
inventive		
compound (I-1-1)/compound (I-1-7)*** + acrinathrin (1 : 25) inventive	0.032 + 0.8	<u>found</u> * <u>calc.</u> ** 80 0
alpha-cypermethrin	0.16	70
compound (I-1-2)/compound (I-1-8)*** + alpha-cypermethrin (1 : 1) inventive	0.16 + 0.16	<u>found</u> * <u>calc.</u> ** 90 70
Bacillus firmus strain I-1582	250	0
compound (I-1-1)/compound (I-1-7)*** + Bacillus firmus I-1582 (1 : 312.5) inventive	0.8 + 250	<u>found</u> * <u>calc.</u> ** 100 80
bifenthrin	0.8	80
compound (I-1-1)/compound (I-1-7)*** + bifenthrin (1 : 1) inventive	0.8 + 0.8	<u>found</u> * <u>calc.</u> ** 100 80
β-cyfluthrin	0.16 0.032	70 0
compound (I-1-2)/compound (I-1-8)*** + β - cyfluthrin (5 : 1) inventive	0.16 + 0.032	<u>found</u> * <u>calc.</u> ** 70 0
compound (I-1-1)/compound (I-1-7)*** + β - cyfluthrin (5 : 1) inventive	0.8 + 0.16	<u>found</u> * <u>calc.</u> ** 90 70
buprofezin	500	0
compound (I-1-1)/compound (I-1-7)*** + buprofezin (1 : 625) inventive	0.8 + 500	<u>found</u> * <u>calc.</u> ** 70 0
cadusaphos	20	0
compound (I-1-2)/compound (I-1-8)*** + cadusaphos (1 : 25) inventive	0.8 + 20	<u>found</u> * <u>calc.</u> ** 90 0
compound (I-1-1)/compound (I-1-7)*** + cadusaphos (1 : 25) inventive	0.8 + 20	<u>found</u> * <u>calc.</u> ** 90 0
carbaryl	500	0
compound (I-1-2)/compound (I-1-8)*** + carbaryl (1 : 125) inventive	4 + 500	<u>found</u> * <u>calc.</u> ** 90 0
carbofuran	20	70
compound (I-1-2)/compound (I-1-8)*** + carbofuran (1 : 25) inventive	0.8 + 20	<u>found</u> * <u>calc.</u> ** 90 70

<u>Active ingredient</u>	<u>Concentration in g/ha</u>	<u>Kill rate in % after 1d</u>
chlorpyrifos	4	80
compound (I-1-2)/compound (I-1-8)*** + chlorpyrifos (1 : 25) inventive	0.16 + 4	<u>found</u>* <u>calc.</u>** 100 80
clothianidin	20	70
compound (I-1-2)/compound (I-1-8)*** + clothianidin (1 : 5) inventive	4 + 20	<u>found</u>* <u>calc.</u>** 90 70
cypermethrin	4	80
compound (I-1-1)/compound (I-1-7)*** + cypermethrin (1 : 5) inventive	0.8 + 4	<u>found</u>* <u>calc.</u>** 100 80
deltamethrin	0.8	0
compound (I-1-2)/compound (I-1-8)*** + deltamethrin (1 : 1) inventive	0.8 + 0.8	<u>found</u>* <u>calc.</u>** 100 0
compound (I-1-1)/compound (I-1-7)*** + deltamethrin (1 : 1) inventive	0.8 + 0.8	<u>found</u>* <u>calc.</u>** 80 0
diafenthiuron	100	0
compound (I-1-1)/compound (I-1-7)*** + diafenthiuron (1 : 125) inventive	0.8 + 100	<u>found</u>* <u>calc.</u>** 70 0
emamectin benzoate	0.8 0.16	0 0
compound (I-1-2)/compound (I-1-8)*** + emamectin benzoate (5 : 1) inventive	4 + 0.8	<u>found</u>* <u>calc.</u>** 70 0
compound (I-1-1)/compound (I-1-7)*** + emamectin benzoate (5 : 1) inventive	0.8 + 0.16	<u>found</u>* <u>calc.</u>** 70 0
ethiprole	4	0
compound (I-1-2)/compound (I-1-8)*** + ethiprole (1 : 5) inventive	0.8 + 4	<u>found</u>* <u>calc.</u>** 80 0
compound (I-1-1)/compound (I-1-7)*** + ethiprole (1 : 5) inventive	0.8 + 4	<u>found</u>* <u>calc.</u>** 70 0
flonicamid	20	0
compound (I-1-2)/compound (I-1-8)*** + flonicamid (1 : 25) inventive	0.8 + 20	<u>found</u>* <u>calc.</u>** 80 0
compound (I-1-1)/compound (I-1-7)*** +		<u>found</u>* <u>calc.</u>**

<u>Active ingredient</u>	<u>Concentration in g/ha</u>	<u>Kill rate in % after 1d</u>
flonicamid (1 : 25) inventive	0.8 + 20	70 0
gamma-cyhalothrin	0.032	0
compound (I-1-1)/compound (I-1-7)*** + gamma-cyhalothrin (5 : 1) inventive	0.16 + 0.032	<u>found</u> * <u>calc.</u>** 70 0
imidacloprid	0.8	0
compound (I-1-2)/compound (I-1-8)*** + imidacloprid (1 : 25) inventive	0.032 + 0.8	<u>found</u> * <u>calc.</u>** 70 0
compound (I-1-1)/compound (I-1-7)*** + imidacloprid (1 : 25) inventive	0.032 + 0.8	<u>found</u> * <u>calc.</u>** 70 0
indoxacarb	20	0
compound (I-1-2)/compound (I-1-8)*** + indoxacarb (1 : 25) inventive	0.8 + 20	<u>found</u> * <u>calc.</u>** 70 0
compound (I-1-1)/compound (I-1-7)*** + indoxacarb (1 : 25) inventive	0.8 + 20	<u>found</u> * <u>calc.</u>** 80 0
L-cyhalothrin	0.16	0
compound (I-1-2)/compound (I-1-8)*** + L-cyhalothrin (1 : 1) inventive	0.16 + 0.16	<u>found</u> * <u>calc.</u>** 80 0
compound (I-1-1)/compound (I-1-7)*** + L-cyhalothrin (1 : 1) inventive	0.16 + 0.16	<u>found</u> * <u>calc.</u>** 90 0
metaflumizone	20	0
compound (I-1-2)/compound (I-1-8)*** + metaflumizone (1 : 25) inventive	0.8 + 20	<u>found</u> * <u>calc.</u>** 70 0
compound (I-1-1)/compound (I-1-7)*** + metaflumizone(1 : 25) inventive	0.8 + 20	<u>found</u> * <u>calc.</u>** 70 0
methamidophos	100 20	80 0
compound (I-1-2)/compound (I-1-8)*** + methamidophos (1 : 25) inventive	4 + 100	<u>found</u> * <u>calc.</u>** 100 80
compound (I-1-1)/compound (I-1-7)*** + methamidophos (1 : 25) inventive	0.8 + 20	<u>found</u> * <u>calc.</u>** 90 0
methiocarb	20	0
compound (I-1-2)/compound (I-1-8)*** +		<u>found</u> * <u>calc.</u>**

Active ingredient	Concentration in g/ha	Kill rate in % after 1d
methiocarb (1 : 25) inventive	0.8 + 20	70 0
compound (I-1-1)/compound (I-1-7)*** + methiocarb (1 : 25) inventive	0.8 + 20	<u>found</u>* <u>calc.</u>** 70 0
milbemectin	0.8	0
compound (I-1-1)/compound (I-1-7)*** + milbemectin (1 : 1) inventive	0.8 + 0.8	<u>found</u>* <u>calc.</u>** 70 0
pyridalyl	4	0
compound (I-1-2)/compound (I-1-8)*** + pyridalyl (1 : 5) inventive	0.8 + 4	<u>found</u>* <u>calc.</u>** 70 0
spinetoram	4	0
compound (I-1-2)/compound (I-1-8)*** + spinetoram (1 : 1) inventive	4 + 4	<u>found</u>* <u>calc.</u>** 70 0
spirodiclofen	100 20	0 0
compound (I-1-2)/compound (I-1-8)*** + spirodiclofen (1 : 25) inventive	4 + 100	<u>found</u>* <u>calc.</u>** 70 0
compound (I-1-1)/compound (I-1-7)*** + spirodiclofen (1 : 25) inventive	0.8 + 20	<u>found</u>* <u>calc.</u>** 70 0
spiromesifen	4	0
compound (I-1-1)/compound (I-1-7)*** + spiromesifen (1 : 5) inventive	0.8 + 4	<u>found</u>* <u>calc.</u>** 70 0
sulfoxaflor	0.16	0
compound (I-1-1)/compound (I-1-7)*** + sulfoxaflor (1 : 1) inventive	0.16 + 0.16	<u>found</u>* <u>calc.</u>** 70 0
tebufenpyrad	0.8	0
compound (I-1-1)/compound (I-1-7)*** + tebufenpyrad (1 : 1) inventive	0.8 + 0.8	<u>found</u>* <u>calc.</u>** 70 0
thiacloprid	20	80
compound (I-1-2)/compound (I-1-8)*** + thiacloprid (1 : 5) inventive	4 + 20	<u>found</u>* <u>calc.</u>** 100 80
thiamethoxam	20	70

<u>Active ingredient</u>	<u>Concentration in g/ha</u>	<u>Kill rate in % after 1d</u>
compound (I-1-2)/compound (I-1-8)*** + thiamethoxam (1 : 5) inventive	4 + 20	<u>found</u>* <u>calc.</u>** 100 70
compound (I-1-1)/compound (I-1-7)*** + thiamethoxam (1 : 5) inventive	0.8 + 4	<u>found</u>* <u>calc.</u>** 90 70
thiodicarb	20	0
compound (I-1-2)/compound (I-1-8)*** + thiodicarb (1 : 25) inventive	0.8 + 20	<u>found</u>* <u>calc.</u>** 70 0
compound (I-1-1)/compound (I-1-7)*** + thiodicarb (1 : 25) inventive	0.8 + 20	<u>found</u>* <u>calc.</u>** 70 0
transfluthrin	20	70
compound (I-1-2)/compound (I-1-8)*** + transfluthrin (1 : 25) inventive	0.8 + 20	<u>found</u>* <u>calc.</u>** 90 70
triazophos	100	0
compound (I-1-2)/compound (I-1-8)*** + triazophos (1 : 125) inventive	0.8 + 100	<u>found</u>* <u>calc.</u>** 70 0
compound (I-1-1)/compound (I-1-7)*** + triazophos (1 : 125) inventive	0.8 + 100	<u>found</u>* <u>calc.</u>** 70 0
4-{{(6-CHLOROPYRID-3- YL)METHYL}(2,2- DIFLUOROETHYL)AMINO}FURAN- 2(5H)-ONE	20	0
compound (I-1-1)/compound (I-1-7)*** + 4-{{(6-CHLOROPYRID-3- YL)METHYL}(2,2- DIFLUOROETHYL)AMINO}FURAN- 2(5H)-ONE (125 : 1) inventive	20 + 0.16	<u>found</u>* <u>calc.</u>** 70 0
pymetrozine	100	0
compound (I-1-1)/compound (I-1-7)*** + pymetrozine (1 : 25) inventive	4 + 100	<u>found</u>* <u>calc.</u>** 100 0
cyromazine	100	0
compound (I-1-1)/compound (I-1-7)*** + cyromazine (1 : 25) inventive	4 + 100	<u>found</u>* <u>calc.</u>** 70 0

Table A – 2: Myzus persicae test

<u>Active ingredient</u>	<u>Concentration in g/ha</u>	<u>Kill rate in % after 6d</u>
compound (I-1-2)/compound (I-1-8)***	0.16 0.032	0 0
compound (I-1-1)/compound (I-1-7)***	0.16 0.032	70 0
acetamiprid	0.16	0
compound (I-1-1)/compound (I-1-7)*** + acetamiprid (1 : 5) inventive	0.032 + 0.16	<u>found</u>* <u>calc.</u>** 70 0
aldicarb	0.8	0
compound (I-1-2)/compound (I-1-8)*** + aldicarb (1 : 5) inventive	0.16 + 0.8	<u>found</u>* <u>calc.</u>** 80 0
chlorfenapyr	0.8 0.16	0 0
compound (I-1-2)/compound (I-1-8)*** + chlorfenapyr (1 : 5) inventive	0.16 + 0.8	<u>found</u>* <u>calc.</u>** 80 0
compound (I-1-1)/compound (I-1-7)*** + chlorfenapyr (1 : 5) inventive	0.032 + 0.16	<u>found</u>* <u>calc.</u>** 70 0
clothianidin	0.16	0
compound (I-1-1)/compound (I-1-7)*** + clothianidin (1 : 5) inventive	0.032 + 0.16	<u>found</u>* <u>calc.</u>** 70 0
cyantraniliprole	0.16	0
compound (I-1-2)/compound (I-1-8)*** + cyantraniliprole (1 : 5) inventive	0.032 + 0.16	<u>found</u>* <u>calc.</u>** 80 0
compound (I-1-1)/compound (I-1-7)*** + cyantraniliprole (1 : 5) inventive	0.032 + 0.16	<u>found</u>* <u>calc.</u>** 70 0
diafenthiuron	20	70
compound (I-1-2)/compound (I-1-8)*** + diafenthiuron (1 : 125) inventive	0.16 + 20	<u>found</u>* <u>calc.</u>** 100 70
ethoprophos	4	0
compound (I-1-2)/compound (I-1-8)*** + ethoprophos (1 : 25) inventive	0.16 + 4	<u>found</u>* <u>calc.</u>** 80 0
fenamiphos		

<u>Active ingredient</u>	<u>Concentration in g/ha</u>	<u>Kill rate in % after 6^d</u>
	0.8	0
compound (I-1-1)/compound (I-1-7)*** + fenamiphos (1 : 25) inventive	0.032 + 0.8	<u>found</u> * <u>calc.</u> ** 70 0
11-(4-CHLORO-2,6-DIMETHYLPHENYL)-12-HYDROXY-1,4-DIOXA-9-AZADISPIRO[4.2.4.2]TETRADEC-11-EN-10-ONE	0.8	0
compound (I-1-1)/compound (I-1-7)*** + 11-(4-CHLORO-2,6-DIMETHYLPHENYL)-12-HYDROXY-1,4-DIOXA-9-AZADISPIRO[4.2.4.2]TETRADEC-11-EN-10-ONE (1 : 25) inventive	0.032 + 0.8	<u>found</u> * <u>calc.</u> ** 70 0
fipronil	0.16	0
compound (I-1-2)/compound (I-1-8)*** + fipronil (1 : 1) inventive	0.16 + 0.16	<u>found</u> * <u>calc.</u> ** 80 0
flufenoxuron	0.8	0
compound (I-1-1)/compound (I-1-7)*** + flufenoxuron (1 : 25) inventive	0.032 + 0.8	<u>found</u> * <u>calc.</u> ** 70 0
methoxyfenozide	4	0
compound (I-1-2)/compound (I-1-8)*** + methoxyfenozide (1 : 25) inventive	0.16 + 4	<u>found</u> * <u>calc.</u> ** 100 0
milbemectin	0.032	0
compound (I-1-1)/compound (I-1-7)*** + milbemectin (1 : 1) inventive	0.032 + 0.032	<u>found</u> * <u>calc.</u> ** 70 0
tebufenozide	4	0
compound (I-1-2)/compound (I-1-8)*** + tebufenozide (1 : 25) inventive	0.16 + 4	<u>found</u> * <u>calc.</u> ** 100 0
tebufenpyrad	0.16	0
compound (I-1-2)/compound (I-1-8)*** + tebufenpyrad (1 : 1) inventive	0.16 + 0.16	<u>found</u> * <u>calc.</u> ** 80 0
triflumuron	20 4	0 0
compound (I-1-2)/compound (I-1-8)*** + triflumuron (1 : 125)	0.16 + 20	<u>found</u> * <u>calc.</u> ** 90 0

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<u>Active ingredient</u>	<u>Concentration in g/ha</u>	<u>Kill rate in % after 6^d</u>
inventive		
compound (I-1-1)/compound (I-1-7)*** + triflumuron (1 : 125) inventive	0.032 + 4	<u>found</u>* <u>calc.</u>** 70 0
spinetoram	0.8	0
compound (I-1-1)/compound (I-1-7)*** + spinetoram (1 : 5) inventive	0.16 + 0.8	<u>found</u>* <u>calc.</u>** 90 70
thiacloprid	0.8	80
compound (I-1-1)/compound (I-1-7)*** + thiacloprid (1 : 25) inventive	0.032 + 0.8	<u>found</u>* <u>calc.</u>** 100 80
2-{6-[2-(5-FLUOROPYRIDIN-3-YL)-1,3-THIAZOL-5-YL]PYRIDIN-2-YL}PYRIMIDINE	0.8	70
compound (I-1-1)/compound (I-1-7)*** + 2-{6-[2-(5-FLUOROPYRIDIN-3-YL)-1,3-THIAZOL-5-YL]PYRIDIN-2-YL}PYRIMIDINE (1 : 25) inventive	0.032 + 0.8	<u>found</u>* <u>calc.</u>** 100 70

* found = effect found

** calc. = effect calculated by Colby's formula

*** In the tested mixtures of compound (I-1-1)/compound (I-1-7) or compound (I-1-2)/compound (I-1-8), the compounds (I-1-1) and (I-1-2) were each present to an extent of approx. 85% or approx. 84%,
5 and the compounds (I-1-7) and (I-1-8) each to an extent of approx. 15%.

Example B**Phaedon cochleariae larvae test**

Solvent: 78 parts by weight of acetone
1.5 parts by weight of dimethylformamide

5 Emulsifier: 0.5 part by weight of alkylaryl polyglycol ether

To produce an appropriate active ingredient formulation, 1 part by weight of active ingredient is mixed with the stated amounts of solvent and emulsifier, and the concentrate is diluted with emulsifier-containing water to the desired concentration.

10 Cabbage leaves (*Brassica oleracea*) are treated by spraying with the active ingredient formulation of the desired concentration and populated with larvae of the mustard beetle (*Phaedon cochleariae*) while the leaves are still moist.

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

15 In this test, the following active ingredient combinations according to the present application exhibit a synergistic enhancement in activity compared to the active ingredients applied individually:

Table B – 1: **Phaedon cochleariae larvae test**

<u>Active ingredient</u>	<u>Concentration in g/ha</u>	<u>Kill rate in % after 2^d</u>
compound (I-1-2)/compound (I-1-8)***	0.16 0.032	50 0
compound (I-1-1)/compound (I-1-7)***	0.16	67
aldicarb	0.8	0
compound (I-1-1)/compound (I-1-7)*** + aldicarb (1 : 5) inventive	0.16 + 0.8	found* calc.** 100 67
β-cyfluthrin	0.032	0
compound (I-1-2)/compound (I-1-8)*** + β-cyfluthrin (5 : 1) inventive	0.16 + 0.032	found* calc.** 67 50
cyantraniliprole	0.16	0
compound (I-1-2)/compound (I-1-8)*** + cyantraniliprole (1 : 5) inventive	0.032 + 0.16	found* calc.** 33 0
dinotefuran	20	0
compound (I-1-2)/compound (I-1-		found* calc.**

8)*** + dinotefuran (1 : 125) inventive	0.16 + 20	83 50
compound (I-1-1)/compound (I-1-7)*** + dinotefuran (1 : 125) inventive	0.16 + 20	<u>found</u> * <u>calc.</u> ** 100 67
fipronil	0.16	67
compound (I-1-2)/compound (I-1-8)*** + fipronil (1 : 1) inventive	0.16 + 0.16	<u>found</u> * <u>calc.</u> ** 100 83.5
compound (I-1-1)/compound (I-1-7)*** + fipronil (1 : 1) inventive	0.16 + 0.16	<u>found</u> * <u>calc.</u> ** 100 83.5
profenophos	4	0
compound (I-1-2)/compound (I-1-8)*** + profenophos (1 : 25) inventive	0.16 + 4	<u>found</u> * <u>calc.</u> ** 83 50
tebufenozide	4	0
compound (I-1-2)/compound (I-1-8)*** + tebufenozide (1 : 1) inventive	0.16 + 4	<u>found</u> * <u>calc.</u> ** 83 50

* found = effect found

** calc. = effect calculated by Colby's formula

*** In the tested mixtures of compound (I-1-1)/compound (I-1-7) or compound (I-1-2)/compound (I-1-8), the compounds (I-1-1) and (I-1-2) were each present to an extent of approx. 85% or approx. 84%,
5 and the compounds (I-1-7) and (I-1-8) each to an extent of approx. 15%.

Table B – 2: *Phaedon cochleariae* larvae test

<u>Active ingredient</u>	<u>Concentration in g/ha</u>	<u>Kill rate in % after 6d</u>
compound (I-1-2)/compound (I-1-8)***	0.032	0
compound (I-1-1)/compound (I-1-7)***	0.16 0.032	83 0
abamectin	0.032	0
compound (I-1-1)/compound (I-1-7)*** + abamectin (5 : 1) inventive	0.16 + 0.032	<u>found</u> * <u>calc.</u> ** 100 83
acephate	4	0
compound (I-1-1)/compound (I-1-7)*** + acephate (1 : 25) inventive	0.16 + 4	<u>found</u> * <u>calc.</u> ** 100 83
cyantraniliprole	0.16	0
compound (I-1-2)/compound (I-1-8)*** + cyantraniliprole (1 : 5)	0.032 + 0.16	<u>found</u> * <u>calc.</u> ** 50 0

inventive		
compound (I-1-1)/compound (I-1-7)*** + cyantraniliprole (1 : 5) inventive	0.032 + 0.16	<u>found</u> * <u>calc.</u>** 100 0
cypermethrin	0.16	0
compound (I-1-2)/compound (I-1-8)*** + cypermethrin (1 : 5) inventive	0.032 + 0.16	<u>found</u> * <u>calc.</u>** 33 0
emamectin benzoate	0.032	0
compound (I-1-1)/compound (I-1-7)*** + emamectin benzoate (5 : 1) inventive	0.16 + 0.032	<u>found</u> * <u>calc.</u>** 100 83
ethoprophos	0.8	0
compound (I-1-2)/compound (I-1-8)*** + ethoprophos (1 : 25) inventive	0.032 + 0.8	<u>found</u> * <u>calc.</u>** 33 0
flubendiamide	0.8	0
compound (I-1-1)/compound (I-1-7)*** + flubendiamide (1 : 5) inventive	0.16 + 0.8	<u>found</u> * <u>calc.</u>** 100 83
novaluron	0.8	0
compound (I-1-1)/compound (I-1-7)*** + novaluron (1 : 5) inventive	0.16 + 0.8	<u>found</u> * <u>calc.</u>** 100 83
profenophos	4	0
compound (I-1-1)/compound (I-1-7)*** + profenophos (1 : 25) inventive	0.16 + 4	<u>found</u> * <u>calc.</u>** 100 83
spirodiclofen	4	0
compound (I-1-1)/compound (I-1-7)*** + spirodiclofen (1 : 25) inventive	0.16 + 4	<u>found</u> * <u>calc.</u>** 100 83
tebufenpyrad	0.16	0
compound (I-1-1)/compound (I-1-7)*** + tebufenpyrad (1 : 1) inventive	0.16 + 0.16	<u>found</u> * <u>calc.</u>** 100 83
triflumuron	4	0
compound (I-1-2)/compound (I-1-8)*** + triflumuron (1 : 125) inventive	0.032 + 4	<u>found</u> * <u>calc.</u>** 50 0
spinetoram	0.16	0
compound (I-1-1)/compound (I-1-7)*** + spinetoram (1 : 5)	0.032 + 0.16	<u>found</u> * <u>calc.</u>** 33 0

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inventive		
pyridalyl	4	0
compound (I-1-1)/compound (I-1-7)*** + pyridalyl (1 : 25) inventive	0.16 + 4	<u>found</u> * <u>calc.</u> ** 100 83
methoxyfenozone	0.8	0
compound (I-1-1)/compound (I-1-7)*** + methoxyfenozone (1 : 5) inventive	0.16 + 0.8	<u>found</u> * <u>calc.</u> ** 100 83
2-{6-[2-(5-FLUOROPYRIDIN-3-YL)-1,3-THIAZOL-5-YL]PYRIDIN-2-YL}PYRIMIDINE	0.16	0
compound (I-1-1)/compound (I-1-7)*** + 2-{6-[2-(5-FLUOROPYRIDIN-3-YL)-1,3-THIAZOL-5-YL]PYRIDIN-2-YL}PYRIMIDINE (1 : 25) inventive	0.16 + 4	<u>found</u> * <u>calc.</u> ** 100 83
cyromazine	4	0
compound (I-1-1)/compound (I-1-7)*** + cyromazine (1 : 25) inventive	0.16 + 4	<u>found</u> * <u>calc.</u> ** 100 83
cyflumetofen	4	0
compound (I-1-1)/compound (I-1-7)*** + Cyflumetofen (1 : 25) inventive	0.16 + 4	<u>found</u> * <u>calc.</u> ** 100 83

* found = effect found

** calc. = effect calculated by Colby's formula

*** In the tested mixtures of compound (I-1-1)/compound (I-1-7) or compound (I-1-2)/compound (I-1-8), the compounds (I-1-1) and (I-1-2) were each present to an extent of approx. 85% or approx. 84%,
5 and the compounds (I-1-7) and (I-1-8) each to an extent of approx. 15%.

Example C**Spodoptera frugiperda larvae test**

Solvent: 78 parts by weight of acetone
1.5 parts by weight of dimethylformamide

5 Emulsifier: 0.5 part by weight of alkylaryl polyglycol ether

To produce an appropriate active ingredient formulation, 1 part by weight of active ingredient is mixed with the stated amounts of solvent and emulsifier, and the concentrate is diluted with emulsifier-containing water to the desired concentration.

10 Cabbage leaves (*Brassica oleracea*) are treated by spraying with the active ingredient formulation of the desired concentration and populated with larvae of the army worm (*Spodoptera frugiperda*) while the leaves are still moist.

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

15 In this test, the following active ingredient combinations according to the present application exhibit a synergistic enhancement in activity compared to the active ingredients applied individually:

Table C – 1: *Spodoptera frugiperda* larvae test

<u>Active ingredient</u>	<u>Concentration in g/ha</u>	<u>Kill rate in % after 2d</u>
compound (I-1-2)/compound (I-1-8)***	0.16 0.032	33 17
fenpyroximate	0.8	0
compound (I-1-2)/compound (I-1-8)*** + fenpyroximate (1 : 5) inventive	0.16 + 0.8	found* calc.** 83 33
gamma-cyhalothrin	0.032	17
compound (I-1-2)/compound (I-1-8)*** + fenpyroximate (5 : 1) inventive	0.16 + 0.032	found* calc.** 83 44.39
indoxacarb	0.8	50
compound (I-1-2)/compound (I-1-8)*** + indoxacarb (1 : 25) inventive	0.032 + 0.8	found* calc.** 83 58.5
triazophos	4	0
compound (I-1-2)/compound (I-1-8)*** + triazophos (1 : 125) inventive	0.032 + 4	found* calc.** 67 17

* found = effect found

** calc. = effect calculated by Colby's formula

*** In the tested mixtures of compound (I-1-1)/compound (I-1-7) or compound (I-1-2)/compound (I-1-8), the compounds (I-1-1) and (I-1-2) were each present to an extent of approx. 85% or approx. 84%,
5 and the compounds (I-1-7) and (I-1-8) each to an extent of approx. 15%.

Table C – 2:

<u>Active ingredient</u>	<u>Concentration in g/ha</u>	<u>Kill rate in % after 6d</u>
compound (I-1-1)/compound (I-1-7)***	0.16 0.032	33 0
carbaryl	4	0
compound (I-1-1)/compound (I-1-7)*** + carbaryl (1 : 125) inventive	0.032 + 4	<u>found</u> * <u>calc.</u>** 50 0
fluensulfone	2000	0
compound (I-1-1)/compound (I-1-7)*** + fluensulfone (1 : 12500) inventive	0.16 + 2000	<u>found</u> * <u>calc.</u>** 67 33
flufenoxuron	0.8	0
compound (I-1-1)/compound (I-1-7)*** + flufenoxuron (1 : 25) inventive	0.032 + 0.8	<u>found</u> * <u>calc.</u>** 100 0
imicyafos	45	0
compound (I-1-1)/compound (I-1-7)*** + imicyafos (1 : 281.25) inventive	0.16 + 45	<u>found</u> * <u>calc.</u>** 83 33
L-cyhalothrin	0.032	0
compound (I-1-1)/compound (I-1-7)*** + L-cyhalothrin (1 : 1) inventive	0.032 + 0.032	<u>found</u> * <u>calc.</u>** 83 0
lufenuron	0.8	17
compound (I-1-1)/compound (I-1-7)*** + lufenuron (1 : 25) inventive	0.032 + 0.8	<u>found</u> * <u>calc.</u>** 67 17
novaluron	0.8	67
compound (I-1-1)/compound (I-1-7)*** + novaluron (1 : 25) inventive	0.032 + 0.8	<u>found</u> * <u>calc.</u>** 83 67
profenophos	4	17

compound (I-1-1)/compound (I-1-7)*** + profenophos (1 : 125) inventive	0.032 + 4	<u>found</u> * <u>calc.</u>** 67 17
chloranthraniliprole	0.032	50
compound (I-1-1)/compound (I-1-7)*** + chloranthraniliprole (1 : 1) inventive	0.032 + 0.032	<u>found</u> * <u>calc.</u>** 100 50
spinosad	0.16	0
compound (I-1-1)/compound (I-1-7)*** + spinosad (1 : 5) inventive	0.032 + 0.16	<u>found</u> * <u>calc.</u>** 33 0
tebufenozide	0.16	0
compound (I-1-1)/compound (I-1-7)*** + tebufenozide (1 : 5) inventive	0.032 + 0.16	<u>found</u> * <u>calc.</u>** 33 0
pyridalyl	4	0
compound (I-1-1)/compound (I-1-7)*** + pyridalyl (1 : 25) inventive	0.16 + 4	<u>found</u> * <u>calc.</u>** 50 33
methoxyfenozide	0.8	0
compound (I-1-1)/compound (I-1-7)*** + methoxyfenozide (1 : 5) inventive	0.16 + 0.8	<u>found</u> * <u>calc.</u>** 67 33
cyromazine	4	0
compound (I-1-1)/compound (I-1-7)*** + cyromazine (1 : 25) inventive	0.16 + 4	<u>found</u> * <u>calc.</u>** 50 33
cyflumetofen	4	17
compound (I-1-1)/compound (I-1-7)*** + cyflumetofen (1 : 25) inventive	0.16 + 4	<u>found</u> * <u>calc.</u>** 50 33

* found = effect found

** calc. = effect calculated by Colby's formula

*** In the tested mixtures of compound (I-1-1)/compound (I-1-7) or compound (I-1-2)/compound (I-1-8), the compounds (I-1-1) and (I-1-2) were each present to an extent of approx. 85% or approx. 84%,
5 and the compounds (I-1-7) and (I-1-8) each to an extent of approx. 15%.

Example D**Tetranychus test** (OP-resistant/spray treatment)

Solvent: 78 parts by weight of acetone
1.5 parts by weight of dimethylformamide

5 Emulsifier: 0.5 part by weight of alkylaryl polyglycol ether

To produce an appropriate active ingredient formulation, 1 part by weight of active ingredient is mixed with the stated amounts of solvent and emulsifier, and the concentrate is diluted with emulsifier-containing water to the desired concentration.

10 Discs of bean leaves (*Phaseolus vulgaris*) infested by all stages of the two-spotted spider mite (*Tetranychus urticae*) are sprayed with an active ingredient formulation of the desired concentration.

After the desired period of time, the effect in % is determined. 100% means that all of the spider mites have been killed; 0% means that none of the spider mites have been killed.

In this test, the following active ingredient combination according to the present application exhibited a synergistic enhancement in activity compared to the active ingredients applied individually:

15 Table D – 1: ***Tetranychus urticae* test**

<u>Active ingredient</u>	<u>Concentration in g/ha</u>	<u>Kill rate in % after 2^d</u>
compound (I-1-2)/compound (I-1-8)***	4 0.8 0.16 0.032	0 0 0 0
compound (I-1-1)/compound (I-1-7)***	4 0.8 0.16 0.032	0 0 0 0
acrinathrin	4 0.8	20 0
compound (I-1-2)/compound (I-1-8)*** + acrinathrin (1 : 25) inventive	0.16 + 4	<u>found</u>* <u>calc.</u>** 70 20
alpha-cypermethrin	4	0
compound (I-1-2)/compound (I-1-8)*** + alpha-cypermethrin (1 : 1) inventive	4 + 4	<u>found</u>* <u>calc.</u>** 80 0
compound (I-1-1)/compound (I-1-7)*** + alpha-cypermethrin (1 : 1) inventive	4 + 4	<u>found</u>* <u>calc.</u>** 70 0
bifenthrin	0.16	0
compound (I-1-2)/compound (I-1-8)***		<u>found</u>* <u>calc.</u>**

+ bifenthrin (1 : 1) inventive	0.16 + 0.16	70 0
compound (I-1-1)/compound (I-1-7)*** + bifenthrin (1 : 1) inventive	0.16 + 0.16	<u>found</u>* <u>calc.</u>** 40 0
carbaryl	500	10
compound (I-1-2)/compound (I-1-8)*** + carbaryl (1 : 125) inventive	4 + 500	<u>found</u>* <u>calc.</u>** 50 10
chlorfenapyr	4	10
compound (I-1-2)/compound (I-1-8)*** + chlorfenapyr (1 : 5) inventive	0.8 + 4	<u>found</u>* <u>calc.</u>** 70 10
compound (I-1-1)/compound (I-1-7)*** + chlorfenapyr (1 : 5) inventive	0.8 + 4	<u>found</u>* <u>calc.</u>** 80 10
diafenthiuron	100	0
compound (I-1-2)/compound (I-1-8)*** + diafenthiuron (1 : 125) inventive	0.8 + 100	<u>found</u>* <u>calc.</u>** 70 0
emamectin benzoate	0.032	0
compound (I-1-2)/compound (I-1-8)*** + emamectin benzoate (5 : 1) inventive	0.16 + 0.032	<u>found</u>* <u>calc.</u>** 30 0
fenamiphos	20	0
compound (I-1-2)/compound (I-1-8)*** + fenamiphos (1 : 25) inventive	0.8 + 20	<u>found</u>* <u>calc.</u>** 20 0
fenpyroximate	0.8	0
compound (I-1-2)/compound (I-1-8)*** + fenpyroximate (1 : 25) inventive	0.032 + 0.8	<u>found</u>* <u>calc.</u>** 50 0
compound (I-1-1)/compound (I-1-7)*** + fenpyroximate (1 : 25) inventive	0.032 + 0.8	<u>found</u>* <u>calc.</u>** 80 0
flubendiamide	20	0
compound (I-1-1)/compound (I-1-7)*** + flubendiamide (1 : 5) inventive	4 + 20	<u>found</u>* <u>calc.</u>** 30 0
fluensulfone	2000	0
compound (I-1-1)/compound (I-1-7)*** + fluensulfone (1 : 500) inventive	4 + 2000	<u>found</u>* <u>calc.</u>** 30 0
gamma – cyhalothrin	0.8	0

compound (I-1-1)/compound (I-1-7)*** + gamma-cyhalothrin (1 : 1) inventive	0.8 + 0.8	<u>found</u>* <u>calc.</u>** 30 0
lufenuron	100	0
compound (I-1-1)/compound (I-1-7)*** + lufenuron (1 : 25) inventive	4 + 100	<u>found</u>* <u>calc.</u>** 20 0
milbemectin	0.032	50
compound (I-1-1)/compound (I-1-7)*** + milbemectin (1 : 1) inventive	0.032 + 0.032	<u>found</u>* <u>calc.</u>** 80 0
spinosad	20	20
compound (I-1-2)/compound (I-1-8)*** + spinosad (1 : 5) inventive	4 + 20	<u>found</u>* <u>calc.</u>** 60 20
spirodiclofen	100	0
compound (I-1-2)/compound (I-1-8)*** + spirodiclofen (1 : 25) inventive	4 + 100	<u>found</u>* <u>calc.</u>** 70 0
compound (I-1-1)/compound (I-1-7)*** + spirodiclofen (1 : 25) inventive	4 + 100	<u>found</u>* <u>calc.</u>** 80 0
spirotetramat	4	0
compound (I-1-2)/compound (I-1-8)*** + spirotetramat (1 : 5) inventive	0.8 + 4	<u>found</u>* <u>calc.</u>** 20 0
tebufenpyrad	0.16	0
compound (I-1-1)/compound (I-1-7)*** + tebufenpyrad (1 : 5) inventive	0.032 + 0.16	<u>found</u>* <u>calc.</u>** 40 0
thiodicarb	100	0
compound (I-1-2)/compound (I-1-8)*** + thiodicarb (1 : 25) inventive	4 + 100	<u>found</u>* <u>calc.</u>** 50 0
compound (I-1-1)/compound (I-1-7)*** + thiodicarb (1 : 25) inventive	4 + 100	<u>found</u>* <u>calc.</u>** 70 0
4-[[[(6-CHLOROPYRID-3- YL)METHYL](2,2- DIFLUOROETHYL)AMINO}FURAN -2(5H)-ONE	20	0
compound (I-1-1)/compound (I-1-7)*** + 4-[[[(6-CHLOROPYRID-3- YL)METHYL](2,2- DIFLUOROETHYL)AMINO}FURAN -2(5H)-ONE (1 : 5)	4 + 20	<u>found</u>* <u>calc.</u>** 20 0

inventive

* found = effect found

** calc. = effect calculated by Colby's formula

*** In the tested mixtures of compound (I-1-1)/compound (I-1-7) or compound (I-1-2)/compound (I-1-8), the compounds (I-1-1) and (I-1-2) were each present to an extent of approx. 85% or approx. 84%,
5 and the compounds (I-1-7) and (I-1-8) each to an extent of approx. 15%.

Table D – 2:

<u>Active ingredient</u>	<u>Concentration in g/ha</u>	<u>Kill rate in % after 6d</u>
compound (I-1-2)/compound (I-1-8)***	4 0.8 0.16 0.032	0 0 0 0
compound (I-1-1)/compound (I-1-7)***	4 0.8 0.16 0.032	10 10 0 0
acrinathrin	0.8	40
compound (I-1-2)/compound (I-1-8)***+ acrinathrin (1 : 25) inventive	0.032 + 0.8	<u>found</u> * <u>calc.</u> ** 70 40
compound (I-1-1)/compound (I-1-7)***+ acrinathrin (1 : 25) inventive	0.032 + 0.8	<u>found</u> * <u>calc.</u> ** 80 40
abamectin	0.032 0.0064	80 0
compound (I-1-2)/compound (I-1-8)***+ abamectin (5 : 1) inventive	0.16 + 0.032	<u>found</u> * <u>calc.</u> ** 100 80
compound (I-1-1)/compound (I-1-7)***+ abamectin (5 : 1) inventive	0.032 + 0.0064	<u>found</u> * <u>calc.</u> ** 70 0
cadusaphos	20	0
compound (I-1-2)/compound (I-1-8)***+ cadusaphos (1 : 25) inventive	0.8 + 20	<u>found</u> * <u>calc.</u> ** 40 0
carbaryl	500	20
compound (I-1-2)/compound (I-1-8)***+ carbaryl (1 : 125) inventive	4 + 500	<u>found</u> * <u>calc.</u> ** 70 20
chlorpyrifos	100	0
compound (I-1-2)/compound (I-1-8)***+ chlorpyrifos (1 : 25)	4 + 100	<u>found</u> * <u>calc.</u> ** 30 0

inventive		
compound (I-1-1)/compound (I-1-7)***+ chlorpyrifos (1 : 25) inventive	4 + 100	<u>found</u> * <u>calc.</u>** 70 10
diafenthiuron	20	10
compound (I-1-2)/compound (I-1-8)***+ diafenthiuron (1 : 125) inventive	0.16 + 20	<u>found</u> * <u>calc.</u>** 30 10
L-cyhalothrin	4	20
compound (I-1-1)/compound (I-1-7)***+ L-cyhalothrin (1 : 1) inventive	4 + 4	<u>found</u> * <u>calc.</u>** 70 28
spinetoram	4	20
compound (I-1-2)/compound (I-1-8)***+ spinetoram (1 : 1) inventive	4 + 4	<u>found</u> * <u>calc.</u>** 80 20
spiromesifen	20 4	80 70
compound (I-1-2)/compound (I-1-8)***+ spiromesifen (1 : 5) inventive	4 + 20	<u>found</u> * <u>calc.</u>** 100 80
compound (I-1-1)/compound (I-1-7)***+ spiromesifen(1 : 5) inventive	0.8 + 4	<u>found</u> * <u>calc.</u>** 90 73
tebufenpyrad	4	40
compound (I-1-2)/compound (I-1-8)***+ tebufenpyrad (1 : 1) inventive	4 + 4	<u>found</u> * <u>calc.</u>** 90 40
compound (I-1-1)/compound (I-1-7)***+ tebufenpyrad (1 : 1) inventive	4 + 4	<u>found</u> * <u>calc.</u>** 80 46
tefluthrin	20	0
compound (I-1-2)/compound (I-1-8)***+ tefluthrin (1 : 5) inventive	4 + 20	<u>found</u> * <u>calc.</u>** 40 0

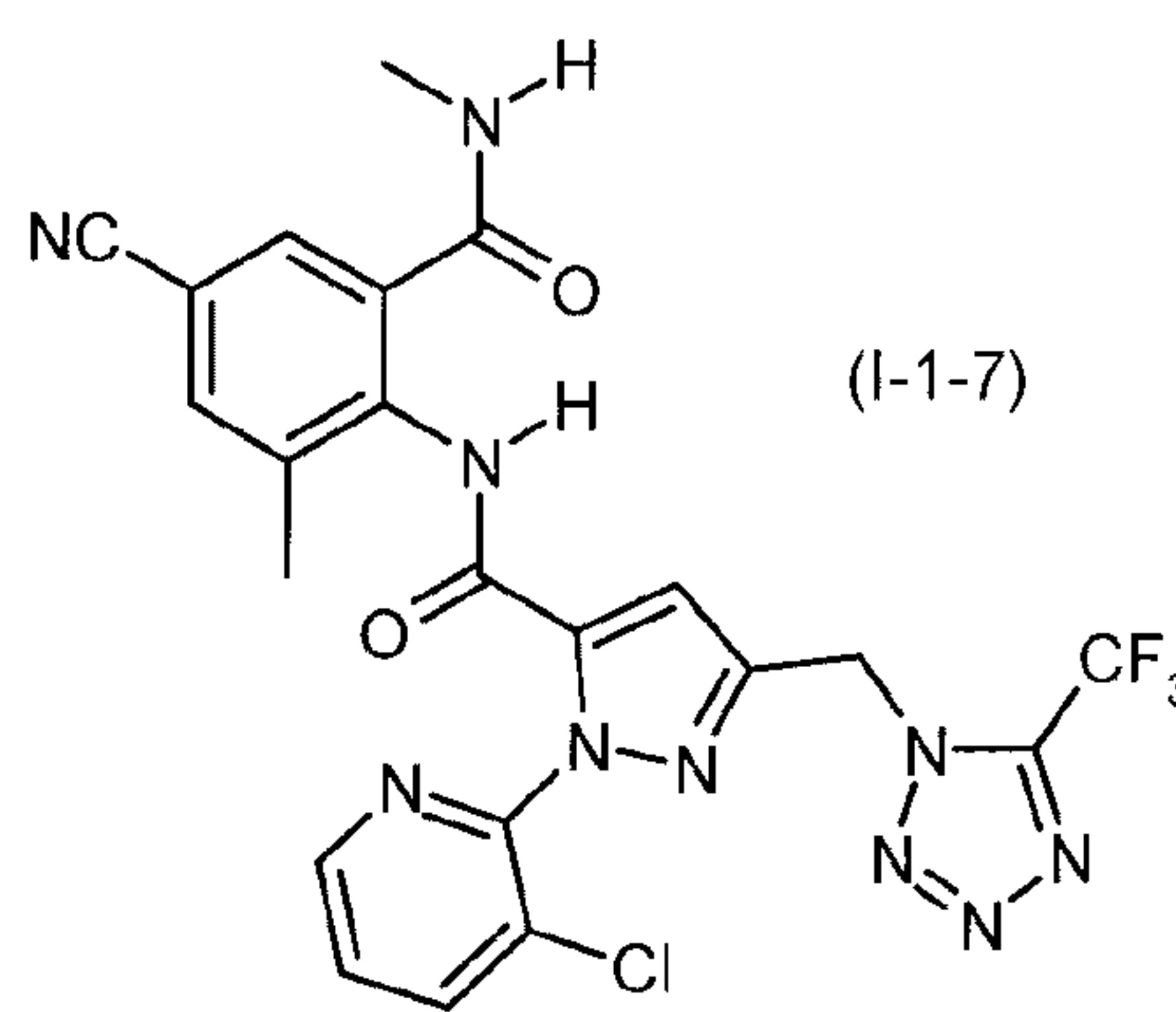
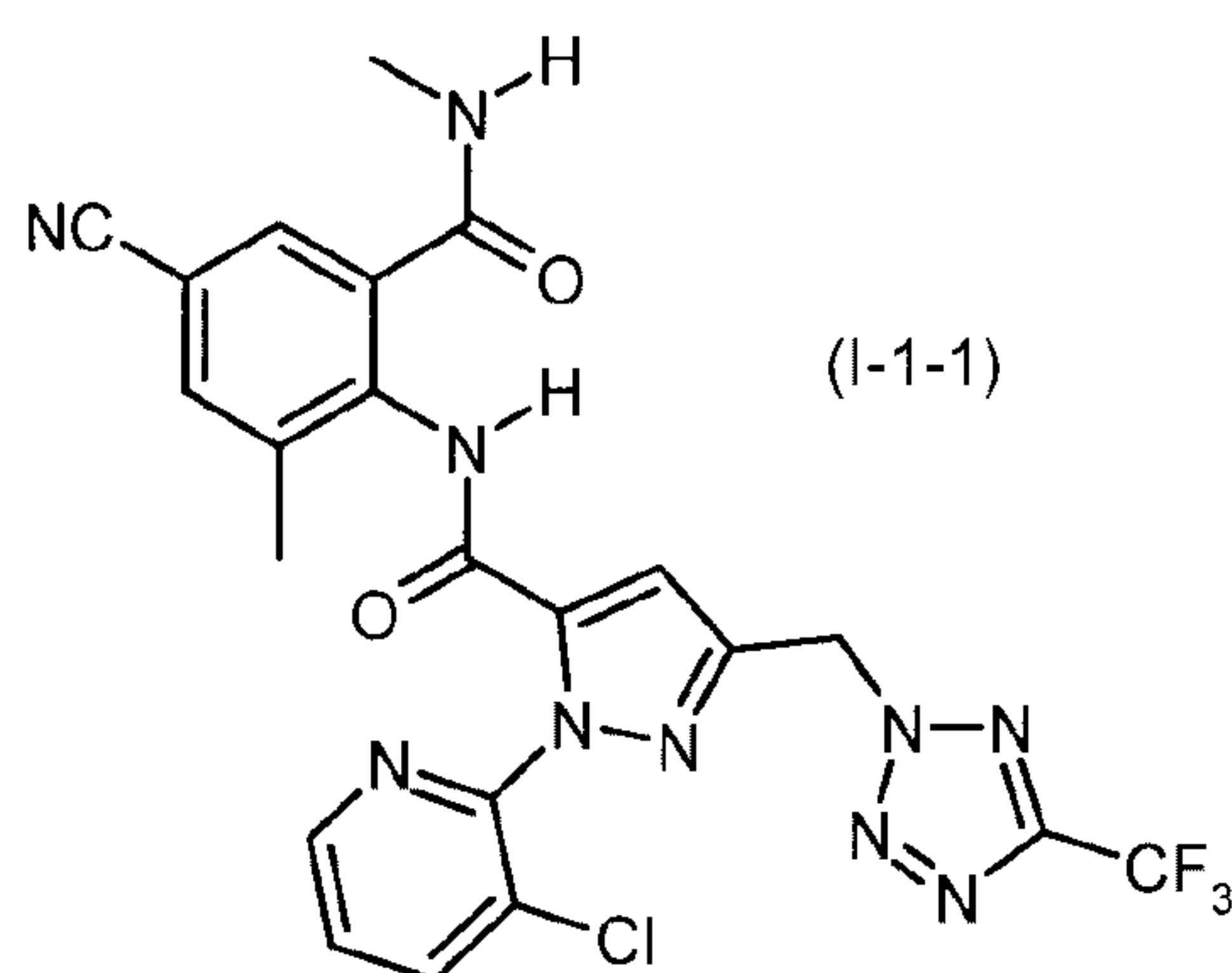
* found = effect found

** calc. = effect calculated by Colby's formula

*** In the tested mixtures of compound (I-1-1)/compound (I-1-7) or compound (I-1-2)/compound (I-1-8), the compounds (I-1-1) and (I-1-2) were each present to an extent of approx. 85% or approx. 84%,
5 and the compounds (I-1-7) and (I-1-8) each to an extent of approx. 15%.

CLAIMS:

1. Active ingredient combinations as insecticides or acaricides comprising a synergistically active combination comprising a mixture of compounds I-1-1/I-1-7:



- 5 or salts thereof, in a ratio of 80:20 to 99:1
and one or more further insecticides and/or acaricides selected from the group consisting of:
- (1) Acetyl cholinesterase (AChE) inhibitors;
 - (2) GABA-gated chloride channel antagonists;
 - 10 (3) Sodium channel modulators/voltage-dependent sodium channel blockers;
 - (4) Nicotinic acetylcholine receptor agonists;
 - (5) Allosteric acetylcholine receptor modulators or agonists;
 - (6) chloride channel activators;
 - (7) Juvenile hormone analogues;
 - 15 (8) Active ingredients with unknown or nonspecific mechanisms of action;
 - (9) Selective antifeedants;
 - (10) mite growth inhibitors;
 - (11) microbial disruptors of the insect gut membrane;
 - (12) Oxidative phosphorylation inhibitors or ATP disruptors;
 - 20 (13) Oxidative phosphorylation decouplers acting by interrupting the H⁺ proton gradient;
 - (14) Nicotinic acetylcholine receptor antagonists;
 - (15) Chitin biosynthesis inhibitors, type 0;
 - (16) Chitin biosynthesis inhibitors, type 1;

- (17) Moulting disruptors;
- (18) Ecdysone agonists/disruptors;
- (19) Octopaminergic agonists;
- (20) Complex-III electron transport inhibitors;
- 5 (21) Complex-I electron transport inhibitors;
- (22) Voltage-dependent sodium channel blockers;
- (23) Inhibitors of acetyl-CoA carboxylase;
- (24) Complex-IV electron transport inhibitors;
- (25) Complex-II electron transport inhibitors; and
- 10 (26) Ryanodine receptor effectors.
2. The active ingredient combinations according to claim 1, wherein the one or more further insecticides and/or acaricides are selected from the group consisting of:
- (1) Acetylcholinesterase (AChE) inhibitors selected from the group consisting of:
- carbamates, alanycarb, aldicarb, bendiocarb, benfuracarb, butocarboxim, butoxycarboxim,
- 15 carbaryl, carbofuran, carbosulfan, ethiofencarb, fenobucarb, formetanate, furathiocarb, isoprocarb, methiocarb, methomyl, metolcarb, oxamyl, pirimicarb, propoxur, thiodicarb, thiofanox, triazamate, trimethacarb, XMC, xylylcarb, organophosphates, acephate, azamethiphos, azinphos (-methyl, -ethyl), cadusafos, chlorethoxyfos, chlorfenvinphos, chlormephos, chlorpyrifos (-methyl), coumaphos, cyanophos, demeton-S-methyl, diazinon, dichlorvos/DDVP,
- 20 dicrotophos, dimethoate, dimethylvinphos, disulfoton, EPN, ethion, ethoprophos, famphur, fenamiphos, fenitrothion, fenthion, fosthiazate, heptenophos, isofenphos, isopropyl O-(methoxyaminothiophosphoryl)salicylate, isoxathion, malathion, mecarbam, methamidophos, methidathion, mevinphos, monocrotophos, naled, omethoate, oxydemeton-methyl, parathion (-methyl), phenthoate, phorate, phosalone, phosmet, phosphamidon, phoxim, pirimiphos
- 25 (-methyl), profenofos, propetamphos, prothiofos, pyraclofos, pyridaphenthion, quinalphos, sulfotep, tebupirimfos, temephos, terbufos, tetrachlorvinphos, thiometon, triazophos, trichlorfon and vamidothion;
- (2) GABA-gated chloride channel antagonists selected from the group consisting of:
- organochlorines, chlordane, endosulfan (alpha-), fiproles, phenylpyrazoles, ethiprole, fipronil,
- 30 pyrafluprole and pyriprole;
- (3) Sodium channel modulators/voltage-dependent sodium channel blockers selected from the group consisting of:

- pyrethroids, acrinathrin, allethrin (d-cis-trans, d-trans), bifenthrin, bioallethrin, bioallethrin-S-cyclopentenyl, bioresmethrin, cycloprothrin, cyfluthrin (beta-), cyhalothrin (gamma-, lambda-), cypermethrin (alpha-, beta-, theta-, zeta-), cyphenothrin [(1*R*)-*trans*-isomers], deltamethrin, dimefluthrin, empenthrin [(*EZ*)-(1*R*)-isomers], esfenvalerate, eto-fenprox, fenpropathrin, fenvalerate, flucythrinate, flumethrin, fluvalinate (tau-), halfenprox, imiprothrin, metofluthrin, permethrin, phenothrin [(1*R*)-*trans*-isomer], prallethrin, profluthrin, pyrethrins (pyrethrum), resmethrin, RU 15525, silafluofen, tefluthrin, tetramethrin [(1*R*)-isomers], tralomethrin, transfluthrin, ZXI 8901, DDT, and methoxychlor;
- (4) Nicotinic acetylcholine receptor agonists selected from the group consisting of:
neonicotinoids, acetamiprid, clothianidin, dinotefuran, imidacloprid, nitenpyram, thiacloprid, thiamethoxam, and nicotine;
- (5) Allosteric acetylcholine receptor modulators (agonists), selected from the group consisting of:
spinosyns, spinetoram, and spinosad;
- (6) chloride channel activators selected from the group consisting of:
avermectins, milbemycins, abamectin, emamectin benzoate, lepimectin and milbemectin;
- (7) Juvenile hormone analogues, selected from the group consisting of: hydroprene, kinoprene, methoprene; fenoxycarb; and pyriproxyfen;
- (8) Active ingredients with unknown or nonspecific mechanisms of action selected from the group consisting of:
fumigants, methyl bromide, alkyl halides, chloropicrin, sulphuryl fluoride, borax, tartar emetic, amidoflumet, azadirachtin, benclothiaz, benzoximate, bifenazate, bromopropylate, chinomethionat, cryolite, cyantraniliprole (Cyazypyr), cyflumetofen, dicofol, diflovidazin, fluensulfone, flufenerim, flufiprole, fluopyram, fufenozide, imidaclothiz, imicyafos, iprodione, pyridalyl, pyrifluquinazon, iodomethane, preparations based on *Bacillus firmus*, I-1582, BioNeem™, Votivo™, dichloropropene, oil, petroleum, metaldehyde, metam-sodium, 3-bromo-N-{2-bromo-4-chloro-6-[(1-cyclopropylethyl)carbamoyl]phenyl}-1-(3-chloropyridin-2-yl)-1*H*-pyrazole-5-carboxamide, 4-{[(6-bromopyrid-3-yl)methyl](2-fluoroethyl)amino}furan-2(5*H*)-one, 4-{[(6-fluoropyrid-3-yl)methyl](2,2-difluoroethyl)amino}furan-2(5*H*)-one, 4-{[(2-chloro-1,3-thiazol-5-yl)methyl](2-fluoroethyl)amino}furan-2(5*H*)-one, 4-{[(6-chloropyrid-3-yl)methyl](2-fluoroethyl)amino}furan-2(5*H*)-one, 4-{[(6-chloropyrid-3-yl)methyl](2,2-difluoroethyl)amino}furan-2(5*H*)-one, 4-{[(6-chloro-5-fluoropyrid-3-yl)methyl](methyl)amino}furan-2(5*H*)-one, 4-{[(5,6-dichloropyrid-3-yl)methyl](2-

fluoroethyl)amino} furan-2(5H)-one, 4-{{(6-chloro-5-fluoropyrid-3-yl)methyl}(cyclopropyl)amino} furan-2(5H)-one, 4-{{(6-chloropyrid-3-yl)methyl}(cyclopropyl)amino} furan-2(5H)-one, 4-{{(6-chloropyrid-3-yl)methyl}(methyl)amino} furan-2(5H)-one, {{[1-(6-chloropyridin-3-yl)ethyl](methyl)oxido- λ^4 -sulphanylidene}cyanamide and its diastereomers {{[(1R)-1-(6-chloropyridin-3-yl)ethyl](methyl)oxido- λ^4 -sulphanylidene}cyanamide (A) and {{[(1S)-1-(6-chloropyridin-3-yl)ethyl](methyl)oxido- λ^4 -sulphanylidene}cyanamide (B) and sulfoxaflo and its diastereomers [(R)-methyl(oxido){[(1R)-1-[6-(trifluoromethyl)pyridin-3-yl]ethyl}- λ^4 -sulphanylidene]cyanamide (A1) and [(S)-methyl(oxido){[(1S)-1-[6-(trifluoromethyl)pyridin-3-yl]ethyl}- λ^4 -sulphanylidene]cyanamide (A2), designated as diastereomer group A, [(R)-methyl(oxido){[(1S)-1-[6-(trifluoromethyl)pyridin-3-yl]ethyl}- λ^4 -sulphanylidene]cyanamide (B1) and [(S)-methyl(oxido){[(1R)-1-[6-(trifluoromethyl)pyridin-3-yl]ethyl}- λ^4 -sulphanylidene]cyanamide (B2), designated as diastereomer group B, and 11-(4-chloro-2,6-dimethylphenyl)-12-hydroxy-1,4-dioxo-9-azadispiro[4.2.4.2]tetradec-11-en-10-one, 3-(4'-fluoro-2,4-dimethylbiphenyl-3-yl)-4-hydroxy-8-oxa-1-azaspiro[4.5]dec-3-en-2-one, 1-{2-fluoro-4-methyl-5-[(2,2,2-trifluoroethyl)sulphinyl]phenyl}-3-(trifluoromethyl)-1H-1,2,4-triazol-5-amine, [(3S,4aR,12R,12aS,12bS)-3-[(cyclopropylcarbonyl)oxy]-6,12-dihydroxy-4,12b-dimethyl-11-oxo-9-(pyridin-3-yl)-1,3,4,4a,5,6,6a,12,12a,12b-decahydro-2H,11H-benzo[f]pyrano[4,3-b]chromen-4-yl)methyl cyclopropanecarboxylate, 2-cyano-3-(difluoromethoxy)-N,N-dimethylbenzenesulphonamide, 2-cyano-3-(difluoromethoxy)-N-methylbenzenesulphonamide, 2-cyano-3-(difluoromethoxy)-N-ethylbenzenesulphonamide, 4-(difluoromethoxy)-N-ethyl-N-methyl-1,2-benzothiazol-3-amine 1,1-dioxide, N-[1-(2,3-dimethylphenyl)-2-(3,5-dimethylphenyl)ethyl]-4,5-dihydro-1,3-thiazol-2-amine, {1'-[(2E)-3-(4-chlorophenyl)prop-2-en-1-yl]-5-fluorospiro[indole-3,4'-piperidin]-1(2H)-yl}(2-chloropyridin-4-yl)methanone, 3-(2,5-dimethylphenyl)-4-hydroxy-8-methoxy-1,8-diazaspiro[4.5]dec-3-en-2-one, 3-(2,5-dimethylphenyl)-8-methoxy-2-oxo-1,8-diazaspiro[4.5]dec-3-en-4-yl ethyl carbonate, 4-(but-2-yn-1-yloxy)-6-(3,5-dimethylpiperidin-1-yl)-5-fluoropyrimidine, (2,2,3,3,4,4,5,5-octafluoropentyl)(3,3,3-trifluoropropyl)malononitrile, (2,2,3,3,4,4,5,5-octafluoropentyl)(3,3,4,4,4-pentafluorobutyl)malononitrile, 8-[2-(cyclopropylmethoxy)-4-(trifluoromethyl)phenoxy]-3-[6-(trifluoromethyl)pyridazin-3-yl]-3-azabicyclo[3.2.1]octane, 2-ethyl-7-methoxy-3-methyl-6-[(2,2,3,3-tetrafluoro-2,3-dihydro-1,4-benzodioxin-6-yl)oxy]quinolin-4-yl methyl carbonate, 2-ethyl-7-methoxy-3-methyl-6-[(2,2,3,3-tetrafluoro-2,3-dihydro-1,4-

- benzodioxin-6-yl)oxy]quinolin-4-yl acetate, PF1364 (CAS Reg. No. 1204776-60-2), 5-[5-(3,5-dichlorophenyl)-5-(trifluoromethyl)-4,5-dihydro-1,2-oxazol-3-yl]-2-(1H-1,2,4-triazol-1-yl)benzonitrile, 5-[5-(2-chloropyridin-4-yl)-5-(trifluoromethyl)-4,5-dihydro-1,2-oxazol-3-yl]-2-(1H-1,2,4-triazol-1-yl)benzonitrile, 4-[5-(3,5-dichlorophenyl)-5-(trifluoromethyl)-4,5-dihydro-1,2-oxazol-3-yl]-2-methyl-N-{2-oxo-2-[(2,2,2-trifluoroethyl)amino]ethyl}benzamide, 4-{[(6-chloropyridin-3-yl)methyl](cyclopropyl)amino}-1,3-oxazol-2(5H)-one, 4-{[(6-chloropyridin-3-yl)methyl](2,2-difluoroethyl)amino}-1,3-oxazol-2(5H)-one, 4-{[(6-chloropyridin-3-yl)methyl](ethyl)amino}-1,3-oxazol-2(5H)-one, 4-{[(6-chloropyridin-3-yl)methyl](methyl)amino}-1,3-oxazol-2(5H)-one, NNI-0711, 1-acetyl-N-[4-(1,1,1,3,3,3-hexafluoro-2-methoxypropan-2-yl)-3-isobutylphenyl]-N-isobutyryl-3,5-dimethyl-1H-pyrazole-4-carboxamide, methyl 2-[2-({[3-bromo-1-(3-chloropyridin-2-yl)-1H-pyrazol-5-yl]carbonyl}amino)-5-chloro-3-methylbenzoyl]-2-methylhydrazinecarboxylate, methyl 2-[2-({[3-bromo-1-(3-chloropyridin-2-yl)-1H-pyrazol-5-yl]carbonyl}amino)-5-cyano-3-methylbenzoyl]-2-ethylhydrazinecarboxylate, methyl 2-[2-({[3-bromo-1-(3-chloropyridin-2-yl)-1H-pyrazol-5-yl]carbonyl}amino)-5-cyano-3-methylbenzoyl]-2-methylhydrazinecarboxylate, methyl 2-[3,5-dibromo-2-({[3-bromo-1-(3-chloropyridin-2-yl)-1H-pyrazol-5-yl]carbonyl}amino)benzoyl]-1,2-diethylhydrazinecarboxylate, methyl 2-[3,5-dibromo-2-({[3-bromo-1-(3-chloropyridin-2-yl)-1H-pyrazol-5-yl]carbonyl}amino)benzoyl]-2-ethylhydrazinecarboxylate, (5RS,7RS;5RS,7SR)-1-(6-chloro-3-pyridylmethyl)-1,2,3,5,6,7-hexahydro-7-methyl-8-nitro-5-propoxyimidazo[1,2-a]pyridine, 2-{6-[2-(5-fluoropyridin-3-yl)-1,3-thiazol-5-yl]pyridin-2-yl}pyrimidine, and 2-{6-[2-(pyridin-3-yl)-1,3-thiazol-5-yl]pyridin-2-yl}pyrimidine;
- (9) Selective antifeedants, selected from the group consisting of pymetrozine and flonicamid;
- (10) mite growth inhibitors selected from the group consisting of: clofentezine, diflovidazin, hexythiazox, and etoxazole;
- (11) microbial disruptors of the insect gut membrane selected from the group consisting of *Bacillus thuringiensis* subspecies *israelensis*, *Bacillus sphaericus*, *Bacillus thuringiensis* subspecies *aizawai*, *Bacillus thuringiensis* subspecies *kurstaki*, *Bacillus thuringiensis* subspecies *tenebrionis*, BT plant proteins, Cry1Ab, Cry1Ac, Cry1Fa, Cry2Ab, mCry3A, Cry3Ab, Cry3Bb, and Cry34/35Ab1;
- (12) Oxidative phosphorylation inhibitors and ATP disruptors, selected from the group consisting of diafenthiuron, organotin compounds, azocyclotin, cyhexatin, fenbutatin oxide, propargite, and tetradifon;

- (13) Oxidative phosphorylation decouplers acting by interrupting the H proton gradient selected from the group consisting of: chlorfenapyr and DNOC;
- (14) Nicotinic acetylcholine receptor antagonists selected from the group consisting of bensultap, cartap, thiocylam, thiosultap, and sodium thiosultap;
- 5 (15) Chitin biosynthesis inhibitors, type 0, selected from the group consisting of benzoyleureas, bistrifluron, chlorfluazuron, diflubenzuron, flucycloxuron, flufenoxuron, hexaflumuron, lufenuron, novaluron, noviflumuron, teflubenzuron and triflumuron;
- (16) buprofezin;
- (17) cyromazine;
- 10 (18) Ecdysone agonists/disruptors selected from the group consisting of: diacylhydrazines, chromafenozide, halofenozide, methoxyfenozide and tebufenozide;
- (19) amitraz;
- (20) Complex-III electron transport inhibitors selected from the group consisting of: hydramethylnone; acequinocyl; and fluacrypyrim;
- 15 (21) Complex-I electron transport inhibitors, selected from the group consisting of the METI acaricides, fenazaquin, fenpyroximate, pyrimidifen, pyridaben, tebufenpyrad, tolfenpyrad, rotenone, and Derris;
- (22) Voltage-dependent sodium channel blockers, selected from the group consisting of indoxacarb, and metaflumizone;
- 20 (23) Inhibitors of acetyl-CoA carboxylase selected from the group consisting of tetrionic acid derivatives, spiroadiclofen, spiromesifen, tetramic acid derivatives, and spirotetramat;
- (24) Complex-IV electron transport inhibitors selected from the group consisting of phosphines, aluminium phosphide, calcium phosphide, phosphine, zinc phosphide, and cyanide;
- (25) cyenopyrafen; and
- 25 (26) Ryanodine receptor effectors selected from the group consisting of: diamides, chlorantraniliprole and flubendiamide.

3. The active ingredient combinations according to claim 1 or 2, wherein the one or more further insecticides and/or acaricides are selected from the group consisting of: acrinathrin, alpha-cypermethrin, betacyfluthrin, deltamethrin, lambda-cyhalothrin, gamma-cyhalothrin, transfluthrin, bifenthrin, tefluthrin, imidacloprid, acetamiprid, thiamethoxam, thiacloprid, dinotefuran, clothianidin, lufenuron, triflumuron, novaluron, flufenoxuron, buprofezin, methoxyfenozide, tebufenozide, fipronil, ethiprole, flubendiamide, chlorantraniliprole (Rynaxypyr), cyazypyr, emamectin, emamectin benzoate,
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abamectin, milbemectin, tebufenpyrad, fenpyroximate, diafenthiuron, spinosad, flonicamid, chlorfenapyr, metaflumizone, indoxacarb, chlorpyrifos, spirotetramat, spiromesifen, spirotetramat, pyridalyl, spinetoram, acephate, triazophos, profenofos, fenamiphos, 4-[[[(6-chloropyridin-3-yl)methyl](2,2-difluoro-ethyl)amino]furan-2(5H)-one, cadusaphos carbaryl carbofuran ethoprophos
 5 thiodicarb aldicarb metamidophos methiocarb sulfoxaflor *Bacillus firmus* I-1582, imicyafos, fluensulfone, 11-(4-chloro-2,6-dimethylphenyl)-12-hydroxy-1,4-dioxo-9-azadispiro[4.2.4.2]tetradec-11-en-10-one, and 2-{6-[2-(5-fluoropyridin-3-yl)-1,3-thiazol-5-yl]pyridin-2-yl}pyrimidine.

4. The active ingredient combinations according to any one of claims 1 to 3, wherein the one or more further insecticides and/or acaricides are selected from the group consisting of:
 10 deltamethrin, bifenthrin, spirotetramat, thiacloprid, imidacloprid, beta-cyfluthrin, and clothianidin.

5. An agrochemical composition comprising the active ingredient combinations according to any one of claims 1 to 4, and extenders and/or surfactants.

6. Use of the active ingredient combinations according to any one of claims 1 to 4 or of the
 15 agrochemical composition according to claim 5 for control of insects or arachnids.

7. A method for controlling insects or arachnids, characterized in that the active ingredient combinations as defined in any one of claims 1 to 4 or the agrochemical composition according to claim 5 is allowed to act on the insects or arachnids.

8. A process for producing agrochemical compositions, characterized in that the active
 20 ingredient combinations as defined in any one of Claims 1 to 4 are mixed with extenders and/or surfactants.