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(54) **Title:** FUNGICIDAL MIXTURES III COMPRISING STROBILURIN-TYPE FUNGICIDES

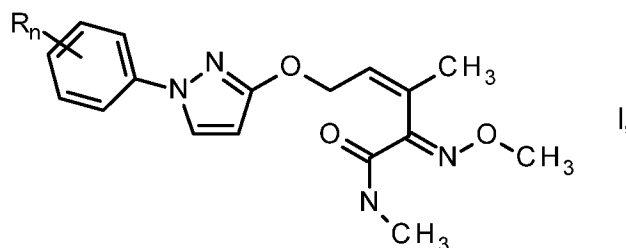
(57) **Abstract:** The present invention relates to fungicidal mixtures, comprising at least one fungicidally active strobilurin-type compound I and at least one pesticide II as defined in the description, and to compositions comprising these mixtures.

## Fungicidal mixtures III comprising strobilurin-type fungicides

## Description

5 The present invention relates to mixtures comprising, as active components

1) at least one compound of formula I



wherein

10 n is an integer and is 0, 1, 2, 3, 4 or 5; and

R, which may be the same or different to any other R, is halogen, hydroxyl, carboxyl, C<sub>1</sub>-C<sub>4</sub>-alkyl, C<sub>2</sub>-C<sub>4</sub>-alkenyl, C<sub>2</sub>-C<sub>8</sub>-alkynyl, C<sub>1</sub>-C<sub>4</sub>-haloalkyl, C<sub>1</sub>-C<sub>4</sub>-alkoxy, C<sub>1</sub>-C<sub>4</sub>-haloalkoxy, C<sub>1</sub>-C<sub>4</sub>-alkylsulfanyl, C<sub>1</sub>-C<sub>4</sub>-haloalkylsulfanyl, C<sub>1</sub>-C<sub>6</sub>-alkoxyimino-C<sub>1</sub>-C<sub>4</sub>-alkyl, C<sub>2</sub>-C<sub>6</sub>-alkenyloxyimino-C<sub>1</sub>-C<sub>4</sub>-alkyl, C<sub>2</sub>-C<sub>6</sub>-alkynyloxyimino-C<sub>1</sub>-C<sub>4</sub>-alkyl, C<sub>1</sub>-C<sub>4</sub>-alkoxyimino-C<sub>1</sub>-C<sub>4</sub>-alkyl, C<sub>1</sub>-C<sub>6</sub>-alkoxyimino-, C<sub>2</sub>-C<sub>6</sub>-alkenyloxyimino-, C<sub>2</sub>-C<sub>6</sub>-alkynyloxyimino-, C<sub>2</sub>-C<sub>6</sub>-haloalkenyloxyimino-, C<sub>3</sub>-C<sub>6</sub>-cycloalkyl, C<sub>3</sub>-C<sub>6</sub>-cycloalkenyl, phenyl or a 5-membered saturated, partially unsaturated or aromatic heterocycl which, in addition to carbon atoms, contains one to three heteroatoms from the group consisting of N, O and S as ring members; wherein the aforementioned cyclic groups R are attached via a direct bond, an oxygen or sulfur atom and where the aliphatic or cyclic groups R for their part may carry 1, 2, 3 or up to the maximum possible number of identical or different groups R<sup>a</sup>:

R<sup>a</sup>, which may be the same or different to any other R<sup>a</sup>, is halogen, C<sub>1</sub>-C<sub>4</sub>-alkyl or C<sub>1</sub>-C<sub>4</sub>-haloalkyl;

25 and

2) at least one pesticide II selected from:

3-(difluoromethyl)-N-methoxy-1-methyl-N-[1-methyl-2-(2,4,6-trichlorophenyl)ethyl]pyrazole-4-carboxamide, (II-1, known from WO 14/016279), N-[(5-chloro-2-isopropyl-phenyl)-methyl]-N-cyclopropyl-5-fluoro-1,3-dimethyl-pyrazole-4-carboxamide (II-2, known from WO 2014/60521), N-[2-(3,4-difluorophenyl)phenyl]-3-(trifluoromethyl)pyrazine-2-carboxamide (II-3, WO 07/072999), 2-(1-methylheptyl)-4,6-dinitrophenyl-(2E)-2-butenate (II-4, US 2526660), (RS)-2-(1-methylheptyl)-4,6-dinitrophenylcrotonate (II-5, US 2526660), 4-cyclopropyl-N-(2,4-dimethoxyphenyl)thiadiazole-5-carboxamide (II-6, WO 06/98128), 3-[(3,4-dichloroisothiazol-5-yl)methoxy]-1,2-benzothiazole-1,1-dioxide (II-7, WO 07/129454), 9-fluoro-2,2-dimethyl-5-(3-quinoly)-3H-1,4-benzoxazepine (II-8, WO 11/081174), 3-(difluoromethyl)-1,5-dimethyl-N-(1,1,3-trimethylindan-4-yl)pyrazole-4-carboxamide (II-9, WO 11/162397), (RS)-2-methoxy-N-methyl-2-[α-(2,5-xilyloxy)-o-tolyl]acetamide (II-10, WO 14/98201), (3-acetoxy-2-nitro-3-phenyl-propyl) acetate (II-11,

HU 51451), harpin (II-12, WO 94/01546), 2-cyano-N-[1-(2,4-dichlorophenyl)ethyl]-3,3-dimethyl-butanamide (II-13, see Pesticide Manual), 4-(2-bromo-4-fluoro-phenyl)-N-(2-chloro-6-fluoro-phenyl)-2,5-dimethyl-pyrazol-3-amine (II-14, WO 13/116251), N-ethyl-2-[(3-ethynyl-8-methyl-6-quinolyl)oxy]butanamide (II-15, WO 14/610177), N-ethyl-2-[(3-ethynyl-8-methyl-6-quinolyl)oxy]-2-methylsulfanyl-acetamide (II-16, WO 14/60177), 2-[(3-ethynyl-8-methyl-6-quinolyl)oxy]-N-(2-fluoroethyl)butanamide (II-17, WO 14/60177), 2-[(3-ethynyl-8-methyl-6-quinolyl)oxy]-N-(2-fluoroethyl)-2-methoxy-acetamide (II-18, WO 14/60177), 2-[(3-ethynyl-8-methyl-6-quinolyl)oxy]-N-propyl-butanamide (II-19, WO 14/60177), 2-[(3-ethynyl-8-methyl-6-quinolyl)oxy]-2-methoxy-N-propyl-acetamide (II-20, WO 14/60177), 2-[(3-ethynyl-8-methyl-6-quinolyl)oxy]-2-methylsulfanyl-N-propyl-acetamide (II-21, WO 14/60177), 2-[(3-ethynyl-8-methyl-6-quinolyl)oxy]-N-(2-fluoroethyl)-2-methylsulfanyl-acetamide (II-22, WO 14/60177), 3-chloro-6-methyl-5-phenyl-4-(2,4,6-trifluorophenyl)pyridazine (II-23, WO 12/20772), 3-chloro-4-(2,6-difluorophenyl)-6-methyl-5-phenyl-pyridazine (II-24, WO 12/20772), methyl (*E*)-2-[2-[(5-cyano-2-methyl-phenoxy)methyl]phenyl]-3-methoxy-prop-2-enoate (II-25, CN 1907024), methyl (*E*)-2-[2-[(2,5-dimethylphenoxy)methyl]phenyl]-3-methoxy-prop-2-enoate (II-26, CN 1456054), methyl (*E*)-3-(fluoromethoxy)-2-[2-[(3,5,6-trichloro-2-ylidyl)oxymethyl]phenyl]prop-2-enoate (II-27, CN 1907024), methyl (*E*)-2-[2-[[2-(2,4-dichloroanilino)-6-(trifluoromethyl)pyrimidin-4-yl]oxymethyl]phenyl]-3-methoxy-prop-2-enoate (II-28, WO 2010139271), N'-(2,5-dimethyl-4-phenoxy-phenyl)-N-ethyl-N-methyl-formamidine (II-29, EP 2865265), N'-[4-[[3-[(4-chlorophenyl)methyl]-1,2,4-thiadiazol-5-yl]oxy]-2,5-dimethyl-phenyl]-N-ethyl-N-methyl-formamidine (II-30, WO 11/80044), N'-(5-bromo-6-indan-2-yloxy-2-methyl-3-pyridyl)-N-ethyl-N-methyl-formamidine (II-31, WO 12/146125), N'-[5-bromo-6-[1-(3,5-difluorophenyl)ethoxy]-2-methyl-3-pyridyl]-N-ethyl-N-methyl-formamidine (II-32, WO 12/146125), N'-[5-bromo-6-(4-isopropylcyclohexoxy)-2-methyl-3-pyridyl]-N-ethyl-N-methyl-formamidine (II-33, WO 12/146125), N'-[5-bromo-2-methyl-6-(1-phenylethoxy)-3-pyridyl]-N-ethyl-N-methyl-formamidine (II-34, WO 12/146125), 2-(6-benzyl-2-pyridyl)quinazoline (II-35, WO 12/69652), 2-[6-(3-fluoro-4-methoxy-phenyl)-5-methyl-2-pyridyl]quinazoline (II-36, WO 12/69652), [2-[[[(7R,8R,9S)-7-benzyl-9-methyl-8-(2-methylpropanoyloxy)-2,6-dioxo-1,5-dioxonan-3-yl]carbonyl]-4-methoxy-3-pyridyl]oxymethyl 2-methylpropanoate (II-37; WO 03/035617) and [(6S,7R,8R)-8-benzyl-3-[(3-hydroxy-4-methoxy-pyridine-2-carbonyl)amino]-6-methyl-4,9-dioxo-1,5-dioxonan-7-yl] 2-methylpropanoate (II-38; WO 03/035617).

35 Compounds of formula I (herein also referred to as compounds I) and their preparation and their use as fungicidally active compounds have been described in WO 13/092224.

The invention also relates to a method for controlling phytopathogenic harmful fungi using mixtures of at least one compound I and and at least one pesticide II and to the use of compounds I and pesticides II for preparing such mixtures, and to compositions comprising 40 these mixtures and seed comprising these mixtures or coated with this this mixture.

A pesticide is generally a chemical or biological agent (such as pestidal active ingredient, compound, composition, virus, bacterium, antimicrobial or disinfectant) that through its effect

deters, incapacitates, kills or otherwise discourages pests. Target pests can include insects, plant pathogens, weeds, mollusks, birds, mammals, fish, nematodes (roundworms), and microbes that destroy property, cause nuisance, spread disease or are vectors for disease. The term "pesticide" includes also plant growth regulators that alter the expected growth, flowering, or reproduction rate of plants; defoliant that cause leaves or other foliage to drop from a plant, usually to facilitate harvest; desiccants that promote drying of living tissues, such as unwanted plant tops; plant activators that activate plant physiology for defense of against certain pests; safeners that reduce unwanted herbicidal action of pesticides on crop plants; and plant growth promoters that affect plant physiology e.g. to increase plant growth, biomass, yield or any other quality parameter of the harvestable goods of a crop plant.

Practical agricultural experience has shown that the repeated and exclusive application of an individual active compound in the control of harmful fungi leads in many cases to a rapid selection of those fungus strains which have developed natural or adapted resistance against the active compound in question. Effective control of these fungi with the active compound in question is then no longer possible.

To reduce the risk of the selection of resistant fungus strains, mixtures of different active compounds are nowadays conventionally employed for controlling harmful fungi. By combining active compounds having different mechanisms of action, it is possible to ensure successful control over a relatively long period of time.

It is an object of the present invention to provide, with a view to effective resistance management and effective control of phytopathogenic harmful fungi, at application rates which are as low as possible, compositions which, at a reduced total amount of active compounds applied, have improved activity against the harmful fungi and/or other pests (synergistic mixtures) and a broadened activity spectrum, in particular for certain indications.

We have accordingly found that this object is achieved by the compositions, defined herein, comprising at least one compound I and at least one pesticide II as defined herein.

Moreover, we have found that simultaneous, that is joint or separate, application of a compound I and a pesticide II or successive application of a compound I and of pesticide II allows better control of harmful fungi than is possible with the individual compounds alone (synergistic mixtures). Compounds I and/or the pesticides II can be present in different crystal modifications, which may differ in biological activity.

Agriculturally acceptable salts of the compounds I encompass especially the salts of those cations or the acid addition salts of those acids whose cations and anions, respectively, have no adverse effect on the fungicidal action of the compounds I. Suitable cations are thus in particular the ions of the alkali metals, preferably sodium and potassium, of the alkaline earth metals, preferably calcium, magnesium and barium, of the transition metals, preferably manganese, copper, zinc and iron, and also the ammonium ion which, if desired, may carry 1 to 4 C<sub>1</sub>-C<sub>4</sub>-alkyl substituents and/or one phenyl or benzyl substituent, preferably diisopropylammonium, tetramethylammonium, tetrabutylammonium, trimethylbenzylammonium, furthermore phosphonium ions, sulfonium ions, preferably tri(C<sub>1</sub>-C<sub>4</sub>-alkyl)sulfonium, and sulfoxonium ions, preferably tri(C<sub>1</sub>-C<sub>4</sub>-alkyl)sulfoxonium. Anions of useful acid addition salts are

primarily chloride, bromide, fluoride, hydrogensulfate, sulfate, dihydrogenphosphate, hydrogenphosphate, phosphate, nitrate, bicarbonate, carbonate, hexafluorosilicate, hexafluorophosphate, benzoate, and the anions of C<sub>1</sub>-C<sub>4</sub>-alkanoic acids, preferably formate, acetate, propionate and butyrate. They can be formed by reacting a compound I with an acid of the corresponding anion, preferably of hydrochloric acid, hydrobromic acid, sulfuric acid, phosphoric acid or nitric acid.

The scope of the present invention includes mixtures of the (*R*)- and (*S*)-isomers and the racemates of compounds I and/or pesticides II having one or more chiral centers. As a result of hindered rotation of asymmetrically substituted groups, atropisomers of compounds I and/or II may be present. They also form part of the subject matter of the invention.

Preferably, the components 1) and 2) in these mixtures are present in a synergistically effective amount.

According to one embodiment of the invention, n is 1, 2 or 3 in formula I of component 1) of binary and ternary mixtures.

According to another embodiment, R is halogen, C<sub>1</sub>-C<sub>4</sub>-alkyl, C<sub>1</sub>-C<sub>4</sub>-haloalkyl, C<sub>1</sub>-C<sub>4</sub>-alkoxy, C<sub>1</sub>-C<sub>4</sub>-haloalkoxy, C<sub>1</sub>-C<sub>4</sub>-alkylsulfanyl, C<sub>1</sub>-C<sub>4</sub>-haloalkylsulfanyl or C<sub>3</sub>-C<sub>6</sub>-cycloalkyl in formula I of component 1) of binary and ternary mixtures.

According to one embodiment of the invention, compounds of formula I are selected from (*Z*,*2E*)-5-[1-(4-chlorophenyl)pyrazol-3-yl]oxy-2-methoxyimino-N,3-dimethyl-pent-3-enamide (I-1), (*Z*,*2E*)-5-[1-(2,4-difluorophenyl)pyrazol-3-yl]oxy-2-methoxyimino-N,3-dimethyl-pent-3-enamide (I-2), (*Z*,*2E*)-5-[1-(2,4-dichlorophenyl)pyrazol-3-yl]oxy-2-methoxyimino-N,3-dimethyl-pent-3-enamide (I-3), (*Z*,*2E*)-5-[1-(2-chloro-4-methyl-phenyl)pyrazol-3-yl]oxy-2-methoxyimino-N,3-dimethyl-pent-3-enamide (I-4), (*Z*,*2E*)-2-methoxyimino-N,3-dimethyl-5-[1-(*p*-tolyl)pyrazol-3-yl]oxy-pent-3-enamide (I-5), (*Z*,*2E*)-5-[1-(2-methyl-4-fluoro-phenyl)pyrazol-3-yl]oxy-2-methoxyimino-N,3-dimethyl-pent-3-enamide (I-6), (*Z*,*2E*)-2-methoxyimino-N,3-dimethyl-5-[1-[4-(trifluoromethyl)phenyl]pyrazol-3-yl]oxy-pent-3-enamide (I-7), (*Z*,*2E*)-5-[1-(3,4-dichlorophenyl)pyrazol-3-yl]oxy-2-methoxyimino-N,3-dimethyl-pent-3-enamide (I-8), (*Z*,*2E*)-5-[1-(3,4-dimethylphenyl)pyrazol-3-yl]oxy-2-methoxyimino-N,3-dimethyl-pent-3-enamide (I-9), (*Z*,*2E*)-5-[1-(4-fluoro-3-methylphenyl)pyrazol-3-yl]oxy-2-methoxyimino-N,3-dimethyl-pent-3-enamide (I-10), (*Z*,*2E*)-5-[1-(3-chloro-4-fluoro-phenyl)pyrazol-3-yl]oxy-2-methoxyimino-N,3-dimethyl-pent-3-enamide (I-11), (*Z*,*2E*)-5-[1-(3-fluoro-4-chloro-phenyl)pyrazol-3-yl]oxy-2-methoxyimino-N,3-dimethyl-pent-3-enamide (I-12), (*Z*,*2E*)-5-[1-(4-chloro-2-fluoro-phenyl)pyrazol-3-yl]oxy-2-methoxyimino-N,3-dimethyl-pent-3-enamide (I-13), (*Z*,*2E*)-5-[1-[4-(difluoromethoxy)phenyl]pyrazol-3-yl]oxy-2-methoxyimino-N,3-dimethyl-pent-3-enamide (I-14), (*Z*,*2E*)-5-[1-(3-cyclopropylphenyl)pyrazol-3-yl]oxy-2-methoxyimino-N,3-dimethyl-pent-3-enamide (I-15), (*Z*,*2E*)-5-[1-[4-chloro-3-(trifluoromethyl)phenyl]pyrazol-3-yl]oxy-2-methoxyimino-N,3-dimethyl-pent-3-enamide (I-16), (*Z*,*2E*)-2-methoxyimino-N,3-dimethyl-5-[1-(3,4,5-trifluorophenyl)pyrazol-3-yl]oxy-pent-3-enamide (I-17) and (*Z*,*2E*)-2-methoxyimino-N,3-dimethyl-5-[1-[4-(trifluoromethylsulfanyl)phenyl]pyrazol-3-yl]oxy-pent-3-enamide (I-18); as component 1) of the binary and ternary mixtures as defined herein.

According to one embodiment of the invention, compounds of formula I are selected from (*Z*,*2E*)-5-[1-(4-chlorophenyl)pyrazol-3-yl]oxy-2-methoxyimino-N,3-dimethyl-pent-3-enamide (I-1), (*Z*,*2E*)-5-[1-(2,4-dichlorophenyl)pyrazol-3-yl]oxy-2-methoxyimino-N,3-dimethyl-pent-3-enamide

(I-3), and (*Z,Z,E*)-5-[1-(4-chloro-2-fluoro-phenyl)pyrazol-3-yl]oxy-2-methoxyimino-N,3-dimethyl-pent-3-enamide (I-13); as component 1) of the binary and ternary mixtures as defined herein.

According to another embodiment of the invention, pesticides II are selected from pesticides II-1, II-2, II-3, II-4, II-5, II-6, II-7, II-8, II-9 and II-10 as defined above; and more preferably from pesticides II-1, II-2 and II-3.

According to a further embodiment of the invention, pesticides II are selected from pesticides II-37 and II-38 as defined above; and preferably from pesticides [2-[[[(3S,7R,8R,9S)-7-benzyl-9-methyl-8-(2-methylpropanoyloxy)-2,6-dioxo-1,5-dioxonan-3-yl]carbamoyl]-4-methoxy-3-pyridyl]oxymethyl 2-methylpropanoate (II-37-A), [2-[[[(3R,7R,8R,9S)-7-benzyl-9-methyl-8-(2-methylpropanoyloxy)-2,6-dioxo-1,5-dioxonan-3-yl]carbamoyl]-4-methoxy-3-pyridyl]oxymethyl 2-methylpropanoate (II-37-B), [(3S,6S,7R,8R)-8-benzyl-3-[(3-hydroxy-4-methoxy-pyridine-2-carbonyl)amino]-6-methyl-4,9-dioxo-1,5-dioxonan-7-yl] 2-methylpropanoate (II-38-A) and [(3R,6S,7R,8R)-8-benzyl-3-[(3-hydroxy-4-methoxy-pyridine-2-carbonyl)amino]-6-methyl-4,9-dioxo-1,5-dioxonan-7-yl] 2-methylpropanoate (II-38-B); and even more preferably from pesticides II-37-A and II-38-A as defined above.

According to a further embodiment, compounds I are selected from compounds I-1, I-3 and I-13 and pesticides II are selected from pesticides II-1, II-2, II-3, II-4, II-5, II-6, II-7, II-8, II-9 and II-10 as defined above; and more preferably from pesticides II-1, II-2 and II-3.

Particularly preferred are the following binary mixtures listed in Table A wherein compounds I are selected from compounds I-1, I-3 and I-13 as defined above and pesticides II are selected from pesticides II-1 to II-38 as defined above.

Table A: Binary Mixtures A-1 to A-132 comprising as active ingredients one compound I as defined and numbered below as component 1) (Co. 1) and one pesticide II as defined and numbered above as component 2) (Co. 2).

Mixt.	Co. 1	Co. 2
A-1	I-1	II-1
A-2	I-1	II-2
A-3	I-1	II-3
A-4	I-1	II-4
A-5	I-1	II-5
A-6	I-1	II-6
A-7	I-1	II-7
A-8	I-1	II-8
A-9	I-1	II-9
A-10	I-1	II-10
A-11	I-1	II-11
A-12	I-1	II-12
A-13	I-1	II-13
A-14	I-1	II-14
A-15	I-1	II-15
A-16	I-1	II-16
A-17	I-1	II-17

Mixt.	Co. 1	Co. 2
A-18	I-1	II-18
A-19	I-1	II-19
A-20	I-1	II-20
A-21	I-1	II-21
A-22	I-1	II-22
A-23	I-1	II-23
A-24	I-1	II-24
A-25	I-1	II-25
A-26	I-1	II-26
A-27	I-1	II-27
A-28	I-1	II-28
A-29	I-1	II-29
A-30	I-1	II-30
A-31	I-1	II-31
A-32	I-1	II-32
A-33	I-1	II-33
A-34	I-1	II-34

Mixt.	Co. 1	Co. 2
A-35	I-1	II-35
A-36	I-1	II-36
A-37	I-3	II-1
A-38	I-3	II-2
A-39	I-3	II-3
A-40	I-3	II-4
A-41	I-3	II-5
A-42	I-3	II-6
A-43	I-3	II-7
A-44	I-3	II-8
A-45	I-3	II-9
A-46	I-3	II-10
A-47	I-3	II-11
A-48	I-3	II-12
A-49	I-3	II-13
A-50	I-3	II-14
A-51	I-3	II-15

Mixt.	Co. 1	Co. 2
A-52	I-3	II-16
A-53	I-3	II-17
A-54	I-3	II-18
A-55	I-3	II-19
A-56	I-3	II-20
A-57	I-3	II-21
A-58	I-3	II-22
A-59	I-3	II-23
A-60	I-3	II-24
A-61	I-3	II-25
A-62	I-3	II-26
A-63	I-3	II-27
A-64	I-3	II-28
A-65	I-3	II-29
A-66	I-3	II-30
A-67	I-3	II-31
A-68	I-3	II-32
A-69	I-3	II-33
A-70	I-3	II-34
A-71	I-3	II-35
A-72	I-3	II-36
A-73	I-13	II-1
A-74	I-13	II-2
A-75	I-13	II-3
A-76	I-13	II-4
A-77	I-13	II-5
A-78	I-13	II-6

Mixt.	Co. 1	Co. 2
A-79	I-13	II-7
A-80	I-13	II-8
A-81	I-13	II-9
A-82	I-13	II-10
A-83	I-13	II-11
A-84	I-13	II-12
A-85	I-13	II-13
A-86	I-13	II-14
A-87	I-13	II-15
A-88	I-13	II-16
A-89	I-13	II-17
A-90	I-13	II-18
A-91	I-13	II-19
A-92	I-13	II-20
A-93	I-13	II-21
A-94	I-13	II-22
A-95	I-13	II-23
A-96	I-13	II-24
A-97	I-13	II-25
A-98	I-13	II-26
A-99	I-13	II-27
A-100	I-13	II-28
A-101	I-13	II-29
A-102	I-13	II-30
A-103	I-13	II-31
A-104	I-13	II-32
A-105	I-13	II-33

Mixt.	Co. 1	Co. 2
A-106	I-13	II-34
A-107	I-13	II-35
A-108	I-13	II-36
A-109	I-1	II-37
A-110	I-2	II-37
A-111	I-3	II-37
A-112	I-13	II-37
A-113	I-1	II-38
A-114	I-2	II-38
A-115	I-3	II-38
A-116	I-13	II-38
A-117	I-1	II-37-A
A-118	I-2	II-37-A
A-119	I-3	II-37-A
A-120	I-13	II-37-A
A-121	I-1	II-38-A
A-122	I-2	II-38-A
A-123	I-3	II-38-A
A-124	I-13	II-38-A
A-125	I-1	II-37-B
A-126	I-2	II-37-B
A-127	I-3	II-37-B
A-128	I-13	II-37-B
A-129	I-1	II-38-B
A-130	I-2	II-38-B
A-131	I-3	II-38-B
A-132	I-13	II-38-B

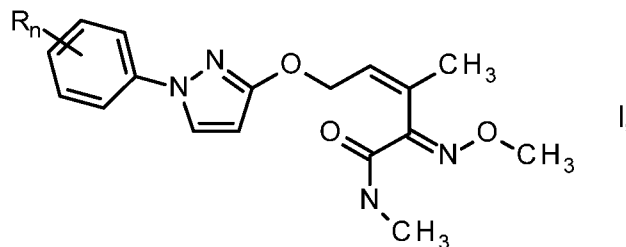
The mixtures and compositions thereof according to the invention can, in the use form as fungicides, also be present together with other active substances, e. g. with herbicides, insecticides, growth regulators, fungicides or else with fertilizers, as pre-mix or, if appropriate, not until immediately prior to use (tank mix).

Mixing the compounds I and pesticides II and the compositions comprising them, respectively, in the use form as fungicides with other fungicides results in many cases in an expansion of the fungicidal spectrum of activity being obtained or in a prevention of fungicide resistance development. Furthermore, in many cases, synergistic effects are obtained.

According to the present invention, it may be preferred that the mixtures comprise besides one compound I and one pesticide II a further active compound or biopesticide III as component 3) (resulting in ternary mixtures), preferably in a synergistically effective amount.

Another embodiment relates to ternary mixtures comprising, as active components

- 1) at least one compound of formula I



5 wherein

n is an integer and is 0, 1, 2, 3, 4 or 5; and

R, which may be the same or different to any other R, is halogen, hydroxyl, carboxyl, C<sub>1</sub>-C<sub>4</sub>-alkyl, C<sub>2</sub>-C<sub>4</sub>-alkenyl, C<sub>2</sub>-C<sub>8</sub>-alkynyl, C<sub>1</sub>-C<sub>4</sub>-haloalkyl, C<sub>1</sub>-C<sub>4</sub>-alkoxy, C<sub>1</sub>-C<sub>4</sub>-haloalkoxy, C<sub>1</sub>-C<sub>4</sub>-alkylsulfanyl, C<sub>1</sub>-C<sub>4</sub>-haloalkylsulfanyl, C<sub>1</sub>-C<sub>6</sub>-alkoxyimino-C<sub>1</sub>-C<sub>4</sub>-alkyl, C<sub>2</sub>-C<sub>6</sub>-alkenyloxyimino-C<sub>1</sub>-C<sub>4</sub>-alkyl, C<sub>2</sub>-C<sub>6</sub>-alkynyloxyimino-C<sub>1</sub>-C<sub>4</sub>-alkyl, C<sub>1</sub>-C<sub>4</sub>-alkoxyimino-C<sub>1</sub>-C<sub>4</sub>-alkyl, C<sub>1</sub>-C<sub>6</sub>-alkoxyimino-, C<sub>2</sub>-C<sub>6</sub>-alkenyloxyimino-, C<sub>2</sub>-C<sub>6</sub>-alkynyloxyimino-, C<sub>2</sub>-C<sub>6</sub>-haloalkenyloxyimino-, C<sub>3</sub>-C<sub>6</sub>-cycloalkyl, C<sub>3</sub>-C<sub>6</sub>-cycloalkenyl, phenyl or a 5-membered saturated, partially unsaturated or aromatic heterocycl which, in addition to carbon atoms, contains one to three heteroatoms from the group consisting of N, O and S as ring members; wherein the aforementioned cyclic groups R are attached via a direct bond, an oxygen or sulfur atom and where the aliphatic or cyclic groups R for their part may carry 1, 2, 3 or up to the maximum possible number of identical or different groups R<sup>a</sup>:

R<sup>a</sup>, which may be the same or different to any other R<sup>a</sup>, is halogen, C<sub>1</sub>-C<sub>4</sub>-alkyl or C<sub>1</sub>-C<sub>4</sub>-haloalkyl;

and

- 2) at least one pesticide II selected from:

3-(difluoromethyl)-N-methoxy-1-methyl-N-[1-methyl-2-(2,4,6-trichlorophenyl)ethyl]pyrazole-4-carboxamide N-[(5-chloro-2-isopropyl-phenyl)methyl]-N-cyclopropyl-5-fluoro-1,3-dimethyl-pyrazole-4-carboxamide, N-[2-(3,4-difluorophenyl)phenyl]-3-(trifluoromethyl)-pyrazine-2-carboxamide, 2-(1-methylheptyl)-4,6-dinitrophenyl-(2*E*)-2-butenate, (*RS*)-2-(1-methylheptyl)-4,6-dinitrophenylcrotonate, 4-cyclopropyl-N-(2,4-dimethoxyphenyl)thiadiazole-5-carboxamide, 3-[(3,4-dichloroisothiazol-5-yl)methoxy]-1,2-benzothiazole-1,1-dioxide, 9-fluoro-2,2-dimethyl-5-(3-quinolyl)-3H-1,4-benzoxazepine, 3-(difluoromethyl)-1,5-dimethyl-N-(1,1,3-trimethylindan-4-yl)pyrazole-4-carboxamide, (*RS*)-2-methoxy-N-methyl-2-[α-(2,5-xylyloxy)-o-tolyl]acetamide, (3-acetoxy-2-nitro-3-phenyl-propyl) acetate, harpin, 2-cyano-N-[1-(2,4-dichlorophenyl)ethyl]-3,3-dimethyl-butanamide, 4-(2-bromo-4-fluoro-phenyl)-N-(2-chloro-6-fluoro-phenyl)-2,5-dimethyl-pyrazol-3-amine, N-ethyl-2-[(3-ethynyl-8-methyl-6-quinolyl)oxy]butanamide, N-ethyl-2-[(3-ethynyl-8-methyl-6-quinolyl)oxy]-2-methylsulfanyl-acetamide, 2-[(3-ethynyl-8-methyl-6-quinolyl)oxy]-N-(2-fluoroethyl)-butanamide, 2-[(3-ethynyl-8-methyl-6-quinolyl)oxy]-N-(2-fluoroethyl)-2-methoxy-acetamide, 2-[(3-ethynyl-8-methyl-6-quinolyl)oxy]-N-propyl-butanamide, 2-[(3-ethynyl-8-methyl-6-quinolyl)oxy]-2-methoxy-N-propyl-acetamide, 2-[(3-ethynyl-8-methyl-6-quinolyl)oxy]-



2-methylsulfanyl-N-propyl-acetamide, 2-[(3-ethynyl-8-methyl-6-quinolyl)oxy]-N-(2-fluoroethyl)-2-methylsulfanyl-acetamide, 3-chloro-6-methyl-5-phenyl-4-(2,4,6-trifluorophenyl)-pyridazine, 3-chloro-4-(2,6-difluorophenyl)-6-methyl-5-phenyl-pyridazine, methyl  
5 (E)-2-[2-[(5-cyano-2-methyl-phenoxy)methyl]phenyl]-3-methoxy-prop-2-enoate, methyl (E)-2-[2-[(2,5-dimethylphenoxy)methyl]phenyl]-3-methoxy-prop-2-enoate, methyl (E)-3-(fluoromethoxy)-2-[2-[(3,5,6-trichloro-2-ylidyl)oxymethyl]phenyl]prop-2-enoate, methyl (E)-2-[2-[[2-(2,4-dichloroanilino)-6-(trifluoromethyl)pyrimidin-4-yl]oxymethyl]phenyl]-3-methoxy-prop-2-enoate, N'-(2,5-dimethyl-4-phenoxy-phenyl)-N-ethyl-N-methyl-  
10 formamidine, N'-[4-[[3-[(4-chlorophenyl)methyl]-1,2,4-thiadiazol-5-yl]oxy]-2,5-dimethyl-phenyl]-N-ethyl-N-methyl-formamidine, N'-(5-bromo-6-indan-2-yloxy-2-methyl-3-pyridyl)-N-ethyl-N-methyl-formamidine, N'-[5-bromo-6-[1-(3,5-difluorophenyl)ethoxy]-2-methyl-3-pyridyl]-N-ethyl-N-methyl-formamidine, N'-[5-bromo-6-(4-isopropylcyclohexoxy)-2-methyl-3-pyridyl]-N-ethyl-N-methyl-formamidine, N'-[5-bromo-2-methyl-6-(1-phenyl-ethoxy)-3-pyridyl]-N-ethyl-N-methyl-formamidine, 2-(6-benzyl-2-pyridyl)quinazoline,  
15 2-[6-(3-fluoro-4-methoxy-phenyl)-5-methyl-2-pyridyl]quinazoline, [2-[[[(7R,8R,9S)-7-benzyl-9-methyl-8-(2-methylpropanoyloxy)-2,6-dioxo-1,5-dioxonan-3-yl]carbamoyle]-4-methoxy-3-pyridyl]oxymethyl 2-methylpropanoate and [(6S,7R,8R)-8-benzyl-3-[(3-hydroxy-4-methoxy-pyridine-2-carbonyl)amino]-6-methyl-4,9-dioxo-1,5-dioxonan-7-yl] 2-methylpropanoate;

20 and

3) at least one further active compound III selected from groups A) to O):

A) Respiration inhibitors

- Inhibitors of complex III at Q<sub>o</sub> site: azoxystrobin (A.1.1), coumethoxystrobin (A.1.2), coumoxystrobin (A.1.3), dimoxystrobin (A.1.4), enestroburin (A.1.5), fenaminstrobin (A.1.6), fenoxystrobin/flufenoxystrobin (A.1.7), fluoxastrobin (A.1.8), kresoxim-methyl (A.1.9), mandestrobin (A.1.10), metominostrobin (A.1.11), oryastrobin (A.1.12), picoxystrobin (A.1.13), pyraclostrobin (A.1.14), pyrametostrobin (A.1.15), pyraoxystrobin (A.1.16), trifloxystrobin (A.1.17), 2-(2-(3-(2,6-dichlorophenyl)-1-methyl-allylideneaminoxymethyl)-phenyl)-2-methoxyimino-N-methyl-acetamide (A.1.18), pyribencarb (A.1.19), triclopyricarb/chlorodincarb (A.1.20), famoxadone (A.1.21), fenamidone (A.1.21), methyl-N-[2-[(1,4-dimethyl-5-phenyl-pyrazol-3-yl)oxyl-methyl]phenyl]-N-methoxy-carbamate (A.1.22), 1-[3-chloro-2-[[1-(4-chlorophenyl)-1H-pyrazol-3-yl]oxymethyl]phenyl]-4-methyl-tetrazol-5-one (A.1.23), 1-[3-bromo-2-[[1-(4-chlorophenyl)pyrazol-3-yl]oxymethyl]phenyl]-4-methyl-tetrazol-5-one (A.1.24),  
35 1-[2-[[1-(4-chlorophenyl)pyrazol-3-yl]oxymethyl]-3-methyl-phenyl]-4-methyl-tetrazol-5-one (A.1.25), 1-[2-[[1-(4-chlorophenyl)pyrazol-3-yl]oxymethyl]-3-fluoro-phenyl]-4-methyl-tetrazol-5-one (A.1.26), 1-[2-[[1-(2,4-dichlorophenyl)pyrazol-3-yl]oxymethyl]-3-fluoro-phenyl]-4-methyl-tetrazol-5-one (A.1.27), 1-[2-[[4-(4-chlorophenyl)thiazol-2-yl]oxymethyl]-3-methyl-phenyl]-4-methyl-tetrazol-5-one (A.1.28), 1-[3-chloro-2-[[4-(p-tolyl)thiazol-2-yl]oxymethyl]phenyl]-4-methyl-tetrazol-5-one (A.1.29), 1-[3-cyclopropyl-2-[[2-methyl-4-(1-methylpyrazol-3-yl)phenoxy]methyl]phenyl]-4-methyl-tetrazol-5-one (A.1.30),  
40 1-[3-(difluoromethoxy)-2-[[2-methyl-4-(1-methylpyrazol-3-yl)phenoxy]methyl]phenyl]-

- 4-methyl-tetrazol-5-one (A.1.31), 1-methyl-4-[3-methyl-2-[[2-methyl-4-(1-methyl-pyrazol-3-yl)phenoxy]methyl]phenyl]tetrazol-5-one (A.1.32), 1-methyl-4-[3-methyl-2-[[1-[3-(trifluoromethyl)phenyl]-ethylideneamino]oxymethyl]phenyl]tetrazol-5-one (A.1.33), (*Z,E*)-5-[1-(2,4-dichlorophenyl)pyrazol-3-yl]-oxy-2-methoxyimino-*N*,3-dimethyl-pent-3-enamide (A.1.34), (*Z,E*)-5-[1-(4-chlorophenyl)pyrazol-3-yl]oxy-2-methoxyimino-*N*,3-dimethyl-pent-3-enamide (A.1.35), pyriminostrobin (A.1.36), bifujunzhi (A.1.37), 2-(ortho-((2,5-dimethylphenyl-oxymethylen)phenyl)-3-methoxy-acrylic acid methylester (A.1.38);
- inhibitors of complex III at Q<sub>i</sub> site: cyazofamid (A.2.1), amisulbrom (A.2.2), [(6*S*,7*R*,8*R*)-8-benzyl-3-[(3-hydroxy-4-methoxy-pyridine-2-carbonyl)amino]-6-methyl-4,9-dioxo-1,5-dioxonan-7-yl] 2-methylpropanoate (A.2.3), fempicoxamid (A.2.4);
  - inhibitors of complex II: benodanil (A.3.1), benzovindiflupyr (A.3.2), bixafen (A.3.3), boscalid (A.3.4), carboxin (A.3.5), fenfuram (A.3.6), fluopyram (A.3.7), flutolanil (A.3.8), fluxapyroxad (A.3.9), furametpyr (A.3.10), isofetamid (A.3.11), isopyrazam (A.3.12), mepronil (A.3.13), oxycarboxin (A.3.14), penflufen (A.3.15), penthiopyrad (A.3.16), pydiflumetofen (A.3.17), pyraziflumid (A.3.18), sedaxane (A.3.19), tecloftalam (A.3.20), thifluzamide (A.3.21), 3-(difluoromethyl)-1-methyl-*N*-(1,1,3-trimethylindan-4-yl)pyrazole-4-carboxamide (A.3.22), 3-(trifluoromethyl)-1-methyl-*N*-(1,1,3-trimethylindan-4-yl)pyrazole-4-carboxamide (A.3.23), 1,3-dimethyl-*N*-(1,1,3-trimethylindan-4-yl)pyrazole-4-carboxamide (A.3.24), 3-(trifluoromethyl)-1,5-dimethyl-*N*-(1,1,3-trimethylindan-4-yl)pyrazole-4-carboxamide (A.3.25), 1,3,5-trimethyl-*N*-(1,1,3-trimethylindan-4-yl)pyrazole-4-carboxamide (A.3.26), 3-(difluoromethyl)-1,5-dimethyl-*N*-(1,1,3-trimethylindan-4-yl)pyrazole-4-carboxamide (A.3.27), 3-(difluoromethyl)-*N*-(7-fluoro-1,1,3-trimethylindan-4-yl)-1-methyl-pyrazole-4-carboxamide (A.3.28), *N*-[(5-chloro-2-isopropyl-phenyl)methyl]-*N*-cyclopropyl-5-fluoro-1,3-dimethyl-pyrazole-4-carboxamide (A.3.29), methyl (*E*)-2-[2-[(5-cyano-2-methyl-phenoxy)methyl]phenyl]-3-methoxy-prop-2-enoate (A.3.30), *N*-[(5-chloro-2-isopropyl-phenyl)methyl]-*N*-cyclopropyl-3-(difluoromethyl)-5-fluoro-1-methyl-pyrazole-4-carboxamide (A.3.31), 2-(difluoromethyl)-*N*-(1,1,3-trimethylindan-4-yl)pyridine-3-carboxamide (A.3.32), 2-(difluoromethyl)-*N*-[(3*R*)-1,1,3-trimethylindan-4-yl]pyridine-3-carboxamide (A.3.33), 2-(difluoromethyl)-*N*-(3-ethyl-1,1-dimethylindan-4-yl)-pyridine-3-carboxamide (A.3.34), 2-(difluoromethyl)-*N*-[(3*R*)-3-ethyl-1,1-dimethylindan-4-yl]-pyridine-3-carboxamide (A.3.35), 2-(difluoromethyl)-*N*-(1,1-dimethyl-3-propylindan-4-yl)-pyridine-3-carboxamide (A.3.36), 2-(difluoromethyl)-*N*-[(3*R*)-1,1-dimethyl-3-propylindan-4-yl]-pyridine-3-carboxamide (A.3.37), 2-(difluoromethyl)-*N*-(3-isobutyl-1,1-dimethylindan-4-yl)-pyridine-3-carboxamide (A.3.38), 2-(difluoromethyl)-*N*-[(3*R*)-3-isobutyl-1,1-dimethylindan-4-yl]pyridine-3-carboxamide (A.3.39);
  - other respiration inhibitors: diflumetorim (A.4.1); nitrophenyl derivates: binapacryl (A.4.2), dinobuton (A.4.3), dinocap (A.4.4), fluazinam (A.4.5), meptyldinocap (A.4.6), ferimzone (A.4.7); organometal compounds: fentin salts, e. g. fentin-acetate (A.4.8), fentin chloride (A.4.9) or fentin hydroxide (A.4.10); ametocradin (A.4.11); silthiofam (A.4.12);

B) Sterol biosynthesis inhibitors (SBI fungicides)

- C14 demethylase inhibitors: triazoles: azaconazole (B.1.1), bitertanol (B.1.2), bromuconazole (B.1.3), cyproconazole (B.1.4), difenoconazole (B.1.5), diniconazole (B.1.6), diniconazole-M (B.1.7), epoxiconazole (B.1.8), fenbuconazole (B.1.9), fluquinconazole (B.1.10), flusilazole (B.1.11), flutriafol (B.1.12), hexaconazole (B.1.13), imibenconazole (B.1.14), ipconazole (B.1.15), metconazole (B.1.17), myclobutanil (B.1.18), oxpoconazole (B.1.19), paclobutrazole (B.1.20), penconazole (B.1.21), propiconazole (B.1.22), prothioconazole (B.1.23), simeconazole (B.1.24), tebuconazole (B.1.25), tetraconazole (B.1.26), triadimefon (B.1.27), triadimenol (B.1.28), triticonazole (B.1.29), uniconazole (B.1.30), ipfentrifluconazole (B.1.37), mefentrifluconazole (B.1.38), 2-(chloromethyl)-2-methyl-5-(p-tolylmethyl)-1-(1,2,4-triazol-1-ylmethyl)cyclopentanol (B.1.43); imidazoles: imazalil (B.1.44), pefurazoate (B.1.45), prochloraz (B.1.46), triflumizol (B.1.47); pyrimidines, pyridines and piperazines: fenarimol (B.1.49), pyrifenoxy (B.1.50), triforine (B.1.51), [3-(4-chloro-2-fluoro-phenyl)-5-(2,4-difluorophenyl)isoxazol-4-yl]-(3-pyridyl)-methanol (B.1.52);
  - Delta14-reductase inhibitors: aldimorph (B.2.1), dodemorph (B.2.2), dodemorph-acetate (B.2.3), fenpropimorph (B.2.4), tridemorph (B.2.5), fenpropidin (B.2.6), piperalin (B.2.7), spiroxamine (B.2.8);
  - Inhibitors of 3-keto reductase: fenhexamid (B.3.1);
  - Other Sterol biosynthesis inhibitors: chlorphenomizole (B.4.1);
- C) Nucleic acid synthesis inhibitors
- phenylamides or acyl amino acid fungicides: benalaxyl (C.1.1), benalaxyl-M (C.1.2), kiralaxyl (C.1.3), metalaxyl (C.1.4), metalaxyl-M (C.1.5), ofurace (C.1.6), oxadixyl (C.1.7);
  - other nucleic acid synthesis inhibitors: hymexazole (C.2.1), othilinone (C.2.2), oxolinic acid (C.2.3), bupirimate (C.2.4), 5-fluorocytosine (C.2.5), 5-fluoro-2-(p-tolylmethoxy)pyrimidin-4-amine (C.2.6), 5-fluoro-2-(4-fluorophenylmethoxy)pyrimidin-4-amine (C.2.7), 5-fluoro-2-(4-chlorophenylmethoxy)pyrimidin-4 amine (C.2.8);
- D) Inhibitors of cell division and cytoskeleton
- tubulin inhibitors: benomyl (D.1.1), carbendazim (D.1.2), fuberidazole (D.1.3), thiabendazole (D.1.4), thiophanate-methyl (D.1.5), 3-chloro-4-(2,6-difluorophenyl)-6-methyl-5-phenyl-pyridazine (D.1.6), 3-chloro-6-methyl-5-phenyl-4-(2,4,6-trifluorophenyl)-pyridazine (D.1.7), N-ethyl-2-[(3-ethynyl-8-methyl-6-quinolyl)oxy]butanamide (D.1.8), N-ethyl-2-[(3-ethynyl-8-methyl-6-quinolyl)oxy]-2-methylsulfanyl-acetamide (D.1.9), 2-[(3-ethynyl-8-methyl-6-quinolyl)oxy]-N-(2-fluoroethyl)butanamide (D.1.10), 2-[(3-ethynyl-8-methyl-6-quinolyl)oxy]-N-(2-fluoroethyl)-2-methoxy-acetamide (D.1.11), 2-[(3-ethynyl-8-methyl-6-quinolyl)oxy]-N-propyl-butamide (D.1.12), 2-[(3-ethynyl-8-methyl-6-quinolyl)oxy]-2-methoxy-N-propyl-acetamide (D.1.13), 2-[(3-ethynyl-8-methyl-6-quinolyl)oxy]-2-methylsulfanyl-N-propyl-acetamide (D.1.14), 2-[(3-ethynyl-8-methyl-6-quinolyl)oxy]-N-(2-fluoroethyl)-2-methylsulfanyl-acetamide (D.1.15), 4-(2-bromo-4-fluoro-phenyl)-N-(2-chloro-6-fluoro-phenyl)-2,5-dimethyl-pyrazol-3-amine (D.1.16);
  - other cell division inhibitors: diethofencarb (D.2.1), ethaboxam (D.2.2), pencycuron (D.2.3), fluopicolide (D.2.4), zoxamide (D.2.5), metrafenone (D.2.6), pyriofenone

(D.2.7);

E) Inhibitors of amino acid and protein synthesis

- methionine synthesis inhibitors: cyprodinil (E.1.1), mepanipyrim (E.1.2), pyrimethanil (E.1.3);

5 - protein synthesis inhibitors: blasticidin-S (E.2.1), kasugamycin (E.2.2), kasugamycin hydrochloride-hydrate (E.2.3), mildiomycin (E.2.4), streptomycin (E.2.5), oxytetracyclin (E.2.6);

F) Signal transduction inhibitors

10 - MAP / histidine kinase inhibitors: fluoroimid (F.1.1), iprodione (F.1.2), procymidone (F.1.3), vinclozolin (F.1.4), fludioxonil (F.1.5);

- G protein inhibitors: quinoxifen (F.2.1);

G) Lipid and membrane synthesis inhibitors

- Phospholipid biosynthesis inhibitors: edifenphos (G.1.1), iprobenfos (G.1.2), pyrazophos (G.1.3), isoprothiolane (G.1.4);

15 - lipid peroxidation: dicloran (G.2.1), quintozone (G.2.2), tecnazene (G.2.3), tolclofos-methyl (G.2.4), biphenyl (G.2.5), chloroneb (G.2.6), etridiazole (G.2.7);

- phospholipid biosynthesis and cell wall deposition: dimethomorph (G.3.1), flumorph (G.3.2), mandipropamid (G.3.3), pyrimorph (G.3.4), benthiavalicarb (G.3.5), iprovalicarb (G.3.6), valifenalate (G.3.7);

20 - compounds affecting cell membrane permeability and fatty acids: propamocarb (G.4.1);

- inhibitors of oxysterol binding protein: oxathiapirolin (G.5.1), 2-{3-[2-(1-{{3,5-bis(difluoromethyl)-1H-pyrazol-1-yl}acetyl)piperidin-4-yl)-1,3-thiazol-4-yl]-4,5-dihydro-1,2-oxazol-5-yl}phenyl methanesulfonate (G.5.2), 2-{3-[2-(1-{{3,5-bis(difluoromethyl)-1H-pyrazol-1-yl}acetyl)piperidin-4-yl) 1,3-thiazol-4-yl]-4,5-dihydro-1,2-oxazol-5-yl}-3-chlorophenyl methanesulfonate (G.5.3), 4-[1-[2-[3-(difluoromethyl)-5-methyl-pyrazol-1-yl]acetyl]-4-piperidyl]-N-tetralin-1-yl-pyridine-2-carboxamide (G.5.4), 4-[1-[2-[3,5-bis(difluoromethyl)pyrazol-1-yl]acetyl]-4-piperidyl]-N-tetralin-1-yl-pyridine-2-carboxamide (G.5.5), 4-[1-[2-[3-(difluoromethyl)-5-(trifluoromethyl)pyrazol-1-yl]acetyl]-4-piperidyl]-N-tetralin-1-yl-pyridine-2-carboxamide (G.5.6), 4-[1-[2-[5-cyclopropyl-3-(difluoromethyl)pyrazol-1-yl]acetyl]-4-piperidyl]-N-tetralin-1-yl-pyridine-2-carboxamide (G.5.7), 4-[1-[2-[5-methyl-3-(trifluoromethyl)pyrazol-1-yl]acetyl]-4-piperidyl]-N-tetralin-1-yl-pyridine-2-carboxamide (G.5.8), 4-[1-[2-[5-(difluoromethyl)-3-(trifluoromethyl)pyrazol-1-yl]acetyl]-4-piperidyl]-N-tetralin-1-yl-pyridine-2-carboxamide (G.5.9), 4-[1-[2-[3,5-bis(trifluoromethyl)pyrazol-1-yl]acetyl]-4-piperidyl]-N-tetralin-1-yl-pyridine-2-carboxamide (G.5.10), (4-[1-[2-[5-cyclopropyl-3-(trifluoromethyl)pyrazol-1-yl]acetyl]-4-piperidyl]-N-tetralin-1-yl-pyridine-2-carboxamide (G.5.11);

H) Inhibitors with Multi Site Action

40 - inorganic active substances: Bordeaux mixture (H.1.1), copper (H.1.2), copper acetate (H.1.3), copper hydroxide (H.1.4), copper oxychloride (H.1.5), basic copper sulfate (H.1.6), sulfur (H.1.7);

- thio- and dithiocarbamates: ferbam (H.2.1), mancozeb (H.2.2), maneb (H.2.3), metam (H.2.4), metiram (H.2.5), propineb (H.2.6), thiram (H.2.7), zineb (H.2.8), ziram (H.2.9);

- organochlorine compounds: anilazine (H.3.1), chlorothalonil (H.3.2), captafol (H.3.3), captan (H.3.4), folpet (H.3.5), dichlofluanid (H.3.6), dichlorophen (H.3.7), hexachlorobenzene (H.3.8), pentachlorophenole (H.3.9) and its salts, phthalide (H.3.10), tolylfluanid (H.3.11);
- 5 - guanidines and others: guanidine (H.4.1), dodine (H.4.2), dodine free base (H.4.3), guazatine (H.4.4), guazatine-acetate (H.4.5), iminoctadine (H.4.6), iminoctadine-triacetate (H.4.7), iminoctadine-tris(albesilate) (H.4.8), dithianon (H.4.9), 2,6-dimethyl-1H,5H-[1,4]dithiino[2,3-c:5,6-c']dipyrrole-1,3,5,7(2H,6H)-tetraone (H.4.10);
- l) Cell wall synthesis inhibitors
- 10 - inhibitors of glucan synthesis: validamycin (I.1.1), polyoxin B (I.1.2);
- melanin synthesis inhibitors: pyroquilon (I.2.1), tricyclazole (I.2.2), carpropamid (I.2.3), dicyclomet (I.2.4), fenoxanil (I.2.5);
- J) Plant defence inducers
- acibenzolar-S-methyl (J.1.1), probenazole (J.1.2), isotianil (J.1.3), tiadinil (J.1.4),
- 15 prohexadione-calcium (J.1.5); phosphonates: fosetyl (J.1.6), fosetyl-aluminum (J.1.7), phosphorous acid and its salts (J.1.8), calcium phosphonate (J.1.11), potassium phosphonate (J.1.12), potassium or sodium bicarbonate (J.1.9), 4-cyclopropyl-N-(2,4-dimethoxyphenyl)thiadiazole-5-carboxamide (J.1.10);
- K) Unknown mode of action
- 20 - bronopol (K.1.1), chinomethionat (K.1.2), cyflufenamid (K.1.3), cymoxanil (K.1.4), dazomet (K.1.5), debacarb (K.1.6), diclocymet (K.1.7), diclomezine (K.1.8), difenzoquat (K.1.9), difenzoquat-methylsulfate (K.1.10), diphenylamin (K.1.11), fenitropan (K.1.12), fenpyrazamine (K.1.13), flumetover (K.1.14), flusulfamide (K.1.15), flutianil (K.1.16), harpin (K.1.17), methasulfocarb (K.1.18), nitrapyrin (K.1.19), nitrothal-isopropyl (K.1.20), tolprocarb (K.1.21), oxin-copper (K.1.22), proquinazid (K.1.23),
- 25 tebufloquin (K.1.24), tecloftalam (K.1.25), triazoxide (K.1.26), N'-(4-(4-chloro-3-trifluoromethyl-phenoxy)-2,5-dimethyl-phenyl)-N-ethyl-N-methyl formamidine (K.1.27), N'-(4-(4-fluoro-3-trifluoromethyl-phenoxy)-2,5-dimethyl-phenyl)-N-ethyl-N-methyl formamidine (K.1.28), N'-[4-[[3-[(4-chlorophenyl)methyl]-1,2,4-thiadiazol-5-yl]oxy]-2,5-dimethyl-phenyl]-N-ethyl-N-methyl-formamidine (K.1.29), N'-(5-bromo-6-indan-2-yloxy-2-methyl-3-pyridyl)-N-ethyl-N-methyl-formamidine (K.1.30), N'-[5-bromo-6-[1-(3,5-difluorophenyl)ethoxy]-2-methyl-3-pyridyl]-N-ethyl-N-methyl-formamidine (K.1.31), N'-[5-bromo-6-(4-isopropylcyclohexoxy)-2-methyl-3-pyridyl]-N-ethyl-N-methyl-formamidine (K.1.32), N'-[5-bromo-2-methyl-6-(1-phenylethoxy)-3-pyridyl]-N-ethyl-N-methyl-
- 35 formamidine (K.1.33), N'-(2-methyl-5-trifluoromethyl-4-(3-trimethylsilanyl-propoxy)-phenyl)-N-ethyl-N-methyl formamidine (K.1.34), N'-(5-difluoromethyl-2-methyl-4-(3-trimethylsilanyl-propoxy)-phenyl)-N-ethyl-N-methyl formamidine (K.1.35), 2-(4-chlorophenyl)-N-[4-(3,4-dimethoxy-phenyl)-isoxazol-5-yl]-2-prop-2-ynyloxy-acetamide (K.1.36), 3-[5-(4-chloro-phenyl)-2,3-dimethyl-isoxazolidin-3-yl]-pyridine (pyrisoxazole) (K.1.37), 3-[5-(4-methylphenyl)-2,3-dimethyl-isoxazolidin-3-yl]-pyridine (K.1.38), 5-chloro-1-(4,6-dimethoxy-pyrimidin-2-yl)-2-methyl-1H-benzoimidazole (K.1.39), ethyl (Z)-3-amino-2-cyano-3-phenyl-prop-2-enoate (K.1.40), picarbutrazox (K.1.41), pentyl
- 40

N-[6-[[*Z*]-[(1-methyltetrazol-5-yl)-phenyl-methylene]amino]oxymethyl]-2-pyridyl]carbamate (K.1.42), but-3-ynyl N-[6-[[*Z*]-[(1-methyltetrazol-5-yl)-phenyl-methylene]amino]oxymethyl]-2-pyridyl]carbamate (K.1.43), 2-[2-[(7,8-difluoro-2-methyl-3-quinolyl)oxy]-6-fluoro-phenyl]propan-2-ol (K.1.44), 2-[2-fluoro-6-[(8-fluoro-2-methyl-3-quinolyl)oxy]-phenyl]propan-2-ol (K.1.45), quinofumelin (K.1.47), 9-fluoro-2,2-dimethyl-5-(3-quinolyl)-3H-1,4-benzoxazepine (K.1.49), 2-(6-benzyl-2-pyridyl)quinazoline (K.1.50), 2-[6-(3-fluoro-4-methoxy-phenyl)-5-methyl-2-pyridyl]quinazoline (K.1.51), dichlobentiazox (K.1.52), N'-(2,5-dimethyl-4-phenoxy-phenyl)-N-ethyl-N-methyl-formamidine (K.1.53);

M) Growth regulators

abscisic acid (M.1.1), amidochlor, ancymidol, 6-benzylaminopurine, brassinolide, butralin, chlormequat, chlormequat chloride, choline chloride, cyclanilide, daminozide, dikegulac, dimethipin, 2,6-dimethylpuridine, ethephon, flumetralin, flurprimidol, fluthiacet, forchlorfenuron, gibberellic acid, inabenfide, indole-3-acetic acid, maleic hydrazide, mefluidide, mepiquat, mepiquat chloride, naphthaleneacetic acid, N-6-benzyladenine, paclobutrazol, prohexadione, prohexadione-calcium, prohydrojasmon, thidiazuron, triapenthenol, tributyl phosphorotrithioate, 2,3,5-tri-iodobenzoic acid, trinexapac-ethyl and uniconazole;

N) Herbicides from classes N.1 to N.15

N.1 Lipid biosynthesis inhibitors: alloxydim, alloxydim-sodium, butoxydim, clethodim, clodinafop, clodinafop-propargyl, cycloxydim, cyhalofop, cyhalofop-butyl, diclofop, diclofop-methyl, fenoxaprop, fenoxaprop-ethyl, fenoxaprop-P, fenoxaprop-P-ethyl, fluazifop, fluazifop-butyl, fluazifop-P, fluazifop-P-butyl, haloxyfop, haloxyfop-methyl, haloxyfop-P, haloxyfop-P-methyl, metamifop, pinoxaden, profoxydim, propaquizafop, quizalofop, quizalofop-ethyl, quizalofop-tefuryl, quizalofop-P, quizalofop-P-ethyl, quizalofop-P-tefuryl, sethoxydim, tepraloxym, tralkoxydim, 4-(4'-chloro-4-cyclopropyl-2'-fluoro[1,1'-biphenyl]-3-yl)-5-hydroxy-2,2,6,6-tetramethyl-2H-pyran-3(6H)-one (CAS 1312337-72-6); 4-(2',4'-dichloro-4-cyclopropyl[1,1'-biphenyl]-3-yl)-5-hydroxy-2,2,6,6-tetramethyl-2H-pyran-3(6H)-one (CAS 1312337-45-3); 4-(4'-chloro-4-ethyl-2'-fluoro[1,1'-biphenyl]-3-yl)-5-hydroxy-2,2,6,6-tetramethyl-2H-pyran-3(6H)-one (CAS 1033757-93-5); 4-(2',4'-Dichloro-4-ethyl[1,1'-biphenyl]-3-yl)-2,2,6,6-tetramethyl-2H-pyran-3,5(4H,6H)-dione (CAS 1312340-84-3); 5-(acetyloxy)-4-(4'-chloro-4-cyclopropyl-2'-fluoro[1,1'-biphenyl]-3-yl)-3,6-dihydro-2,2,6,6-tetramethyl-2H-pyran-3-one (CAS 1312337-48-6); 5-(acetyloxy)-4-(2',4'-dichloro-4-cyclopropyl-[1,1'-biphenyl]-3-yl)-3,6-dihydro-2,2,6,6-tetramethyl-2H-pyran-3-one; 5-(acetyloxy)-4-(4'-chloro-4-ethyl-2'-fluoro[1,1'-biphenyl]-3-yl)-3,6-dihydro-2,2,6,6-tetramethyl-2H-pyran-3-one (CAS 1312340-82-1); 5-(acetyloxy)-4-(2',4'-dichloro-4-ethyl[1,1'-biphenyl]-3-yl)-3,6-dihydro-2,2,6,6-tetramethyl-2H-pyran-3-one (CAS 1033760-55-2); 4-(4'-chloro-4-cyclopropyl-2'-fluoro[1,1'-biphenyl]-3-yl)-5,6-dihydro-2,2,6,6-tetramethyl-5-oxo-2H-pyran-3-yl carbonic acid methyl ester (CAS 1312337-51-1); 4-(2',4'-dichloro-4-cyclopropyl-[1,1'-biphenyl]-3-yl)-5,6-dihydro-2,2,6,6-tetramethyl-5-oxo-2H-pyran-3-yl carbonic acid methyl ester; 4-(4'-chloro-4-ethyl-2'-fluoro[1,1'-biphenyl]-3-yl)-5,6-dihydro-2,2,6,6-tetramethyl-5-oxo-2H-pyran-3-yl carbonic acid methyl ester (CAS

1312340-83-2); 4-(2',4'-dichloro-4-ethyl-[1,1'-biphenyl]-3-yl)-5,6-dihydro-2,2,6,6-tetra-  
methyl-5-oxo-2H-pyran-3-yl carbonic acid methyl ester (CAS 1033760-58-5);  
benfuresate, butylate, cycloate, dalapon, dimepiperate, EPTC, esprocarb,  
ethofumesate, flupropanate, molinate, orbencarb, pebulate, prosulfocarb, TCA,  
5 thiobencarb, tiocarbazil, triallate and vernolate;

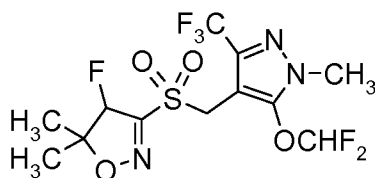
N.2 ALS inhibitors: amidosulfuron, azimsulfuron, bensulfuron, bensulfuron-methyl,  
chlorimuron, chlorimuron-ethyl, chlorsulfuron, cinosulfuron, cyclosulfamuron, etha-  
metsulfuron, ethametsulfuron-methyl, ethoxysulfuron, flazasulfuron, flucetosulfuron,  
flupyralsulfuron, flupyralsulfuron-methyl-sodium, foramsulfuron, halosulfuron, halosulfuron-  
10 methyl, imazosulfuron, iodosulfuron, iodosulfuron-methyl-sodium, iofensulfuron, iofen-  
sulfuron-sodium, mesosulfuron, metazosulfuron, metsulfuron, metsulfuron-methyl,  
nicosulfuron, orthosulfamuron, oxasulfuron, primisulfuron, primisulfuron-methyl, pro-  
pyrisulfuron, prosulfuron, pyrazosulfuron, pyrazosulfuron-ethyl, rimsulfuron, sulfo-  
meturon, sulfometuron-methyl, sulfosulfuron, thifensulfuron, thifensulfuron-methyl,  
15 triasulfuron, tribenuron, tribenuron-methyl, trifloxysulfuron, triflusulfuron, triflusulfuron-  
methyl, tritosulfuron, imazamethabenz, imazamethabenz-methyl, imazamox, imazapic,  
imazapyr, imazaquin, imazethapyr; cloransulam, cloransulam-methyl, diclosulam, flu-  
metsulam, florasulam, metosulam, penoxsulam, pyrimisulfan and pyroxulam; bispyri-  
bac, bispyribac-sodium, pyribenzoxim, pyriftalid, pyriminobac, pyriminobac-methyl,  
20 pyrithiobac, pyrithiobac-sodium, 4-[[[2-[(4,6-dimethoxy-2-pyrimidinyl)oxy]phenyl]-  
methyl]amino]-benzoic acid-1-methyl-ethyl ester (CAS 420138-41-6), 4-[[[2-[(4,6-di-  
methoxy-2-pyrimidinyl)oxy]phenyl]-methyl]amino]-benzoic acid propyl ester (CAS  
420138-40-5), N-(4-bromophenyl)-2-[(4,6-dimethoxy-2-pyrimidinyl)oxy]benzenemeth-  
anamine (CAS 420138-01-8); flucarbazone, flucarbazone-sodium, propoxycarbazone,  
25 propoxycarbazone-sodium, thiencarbazone, thiencarbazone-methyl; triafamone;

N.3 Photosynthesis inhibitors: amicarbazone; chlorotriazine; ametryn, atrazine, chlori-  
dazone, cyanazine, desmetryn, dimethametryn, hexazinone, metribuzin, prometon,  
prometryn, propazine, simazine, simetryn, terbumeton, terbuthylazin, terbutryn, tri-  
etazin; chlorobromuron, chlorotoluron, chloroxuron, dimefuron, diuron, fluometuron,  
30 isoproturon, isouron, linuron, metamitron, methabenzthiazuron, metobenzuron, metox-  
uron, monolinuron, neburon, siduron, tebuthiuron, thiadiazuron, desmedipham, karbu-  
tilat, phenmedipham, phenmedipham-ethyl, bromofenoxim, bromoxynil and its salts  
and esters, ioxynil and its salts and esters, bromacil, lenacil, terbacil, bentazon, ben-  
tazon-sodium, pyridate, pyridafol, pentanochlor, propanil; diquat, diquat-dibromide,  
35 paraquat, paraquat-dichloride, paraquat-dimetilsulfate;

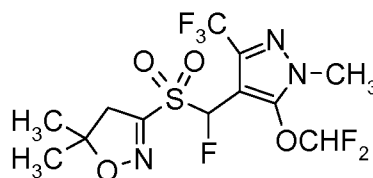
N.4 protoporphyrinogen-IX oxidase inhibitors: acifluorfen, acifluorfen-sodium, azafenidin,  
bencarbazone, benzfendizone, bifenox, butafenacil, carfentrazone, carfentrazone-  
ethyl, chlormethoxyfen, cinidon-ethyl, fluazolate, flufenpyr, flufenpyr-ethyl, flumiclorac,  
flumiclorac-pentyl, flumioxazin, fluoroglycofen, fluoroglycofen-ethyl, fluthiacet, fluthi-  
40 acet-methyl, fomesafen, halosafen, lactofen, oxadiargyl, oxadiazon, oxyfluorfen,  
pentoxazone, profluazol, pyraclonil, pyraflufen, pyraflufen-ethyl, saflufenacil, sulfen-  
trazone, thidiazimin, tiafenacil, trifludimoxazin, ethyl [3-[2-chloro-4-fluoro-5-(1-methyl-

- 5 6-trifluoromethyl-2,4-dioxo-1,2,3,4-tetrahydropyrimidin-3-yl)phenoxy]-2-pyridyloxy]-  
acetate (CAS 353292-31-6), N-ethyl-3-(2,6-dichloro-4-trifluoro-methylphenoxy)-  
5-methyl-1H-pyrazole-1-carboxamide (CAS 452098-92-9), N tetrahydrofurfuryl-  
3-(2,6-dichloro-4-trifluoromethylphenoxy)-5-methyl-1H-pyrazole-1-carboxamide (CAS  
915396-43-9), N-ethyl-3-(2-chloro-6-fluoro-4-trifluoromethylphenoxy)-5-methyl-1H-  
pyrazole-1-carboxamide (CAS 452099-05-7), N tetrahydrofurfuryl-3-(2-chloro-6-flu-  
oro-4-trifluoro-methylphenoxy)-5-methyl-1H-pyrazole-1-carboxamide (CAS 452100-  
03-7), 3-[7-fluoro-3-oxo-4-(prop-2-ynyl)-3,4-dihydro-2H-benzo[1,4]oxazin-6-yl]-1,5-di-  
methyl-6-thioxo-[1,3,5]triazinan-2,4-dione (CAS 451484-50-7), 2-(2,2,7-trifluoro-3-oxo-  
10 4-prop-2-ynyl-3,4-dihydro-2H-benzo[1,4]oxazin-6-yl)-4,5,6,7-tetrahydro-isoindole-  
1,3-dione (CAS 1300118-96-0), 1-methyl-6-trifluoro-methyl-3-(2,2,7-tri-fluoro-3-oxo-  
4-prop-2-ynyl-3,4-dihydro-2H-benzo[1,4]oxazin-6-yl)-1H-pyrimidine-2,4-dione (CAS  
1304113-05-0), methyl (*E*)-4-[2-chloro-5-[4-chloro-5-(difluoromethoxy)-1H-methyl-  
pyrazol-3-yl]-4-fluoro-phenoxy]-3-methoxy-but-2-enoate (CAS 948893-00-3), 3-  
15 [7-chloro-5-fluoro-2-(trifluoromethyl)-1H-benzimidazol-4-yl]-1-methyl-6-(trifluoro-  
methyl)-1H-pyrimidine-2,4-dione (CAS 212754-02-4);
- N.5 Bleacher herbicides: beflubutamid, diflufenican, fluridone, flurochloridone, flurtamone,  
norflurazon, picolinafen, 4-(3-trifluoromethylphenoxy)-2-(4-trifluoromethylphenyl)py-  
rimidine (CAS 180608-33-7); benzobicyclon, benzofenap, bicyclopyrone, clomazone,  
20 fenquintrione, isoxaflutole, mesotrione, pyrasulfotole, pyrazolynate, pyrazoxyfen, sul-  
cotrione, tefuryltrione, tembotrione, tolpyralate, topramezone; aclonifen, amitrole,  
flumeturon;
- N.6 EPSP synthase inhibitors: glyphosate, glyphosate-isopropylammonium, glyposate-  
potassium, glyphosate-trimesium (sulfosate);
- 25 N.7 Glutamine synthase inhibitors: bilanaphos (bialaphos), bilanaphos-sodium,  
glufosinate, glufosinate-P, glufosinate-ammonium;
- N.8 DHP synthase inhibitors: asulam;
- N.9 Mitosis inhibitors: benfluralin, butralin, dinitramine, ethalfluralin, fluchloralin, oryzalin,  
pendimethalin, prodiamine, trifluralin; amiprofos, amiprofos-methyl, butamiphos;  
30 chlorthal, chlorthal-dimethyl, dithiopyr, thiazopyr, propyzamide, tebutam; carbetamide,  
chlorpropham, flamprop, flamprop-isopropyl, flamprop-methyl, flamprop-M-isopropyl,  
flamprop-M-methyl, propham;
- N.10 VLCFA inhibitors: acetochlor, alachlor, butachlor, dimethachlor, dimethenamid,  
dimethenamid-P, metazachlor, metolachlor, metolachlor-S, pethoxamid, pretilachlor,  
35 propachlor, propisochlor, thenylchlor, flufenacet, mefenacet, diphenamid, naproanilide,  
napropamide, napropamide-M, fentrazamide, anilofos, cafenstrole, fenoxasulfone,  
ipfencarbazone, piperophos, pyroxasulfone, isoxazoline compounds of the formulae  
II.1, II.2, II.3, II.4, II.5, II.6, II.7, II.8 and II.9

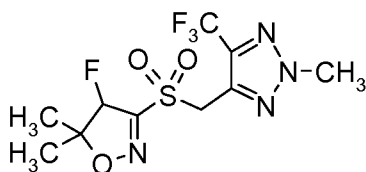




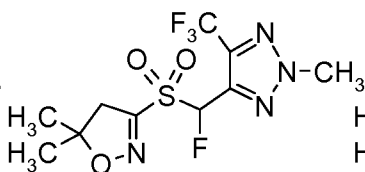
II.1



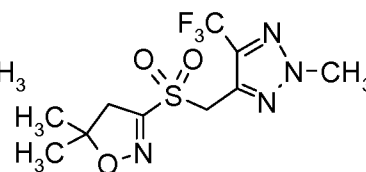
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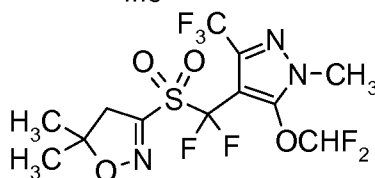
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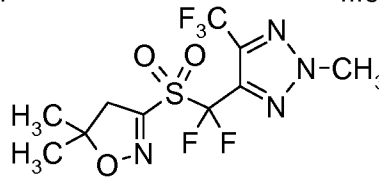
II.4



II.5

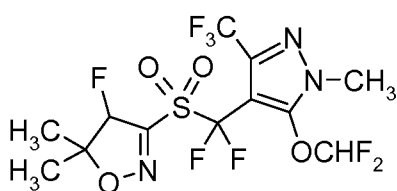


II.6

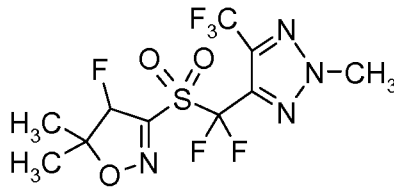


II.7

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II.8



II.9

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N.11 Cellulose biosynthesis inhibitors: chlorthiamid, dichlobenil, flupoxam, indaziflam, isoxaben, triaziflam, 1-cyclohexyl-5-pentafluorophenoxy-14-[1,2,4,6]thiatiazin-3-ylamine (CAS 175899-01-1);

10

N.12 Decoupler herbicides: dinoseb, dinoterb, DNOC and its salts;

N.13 Auxinic herbicides: 2,4-D and its salts and esters, clacyfos, 2,4-DB and its salts and esters, aminocyclopyrachlor and its salts and esters, aminopyralid and its salts such as aminopyralid-dimethylammonium, aminopyralid-tris(2-hydroxypropyl)ammonium and its esters, benazolin, benazolin-ethyl, chloramben and its salts and esters, clomeprop, clopyralid and its salts and esters, dicamba and its salts and esters, dichlorprop and its salts and esters, dichlorprop-P and its salts and esters, fluroxypyr, fluroxypyr-butometyl, fluroxypyr-meptyl, halauxifen and its salts and esters (CAS 943832-60-8); MCPA and its salts and esters, MCPA-thioethyl, MCPB and its salts and esters, mecoprop and its salts and esters, mecoprop-P and its salts and esters, picloram and its salts and esters, quinclorac, quinmerac, TBA (2,3,6) and its salts and esters, triclopyr and its salts and esters, 4-amino-3-chloro-6-(4-chloro-2-fluoro-3-methoxyphenyl)-5-fluoropyridine-2-carboxylic acid, benzyl 4-amino-3-chloro-6-(4-chloro-2-fluoro-3-methoxyphenyl)-5-fluoropyridine-2-carboxylate (CAS 1390661-72-9);

15

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N.14 Auxin transport inhibitors: diflufenzopyr, diflufenzopyr-sodium, naptalam and naptalam-sodium;

25

- N.15 Other herbicides: bromobutide, chlorflurenol, chlorflurenol-methyl, cinmethylin, cumyluron, cyclopyrimorate (CAS 499223-49-3) and its salts and esters, dalapon, dazomet, difenzoquat, difenzoquat-metilsulfate, dimethipin, DSMA, dymron, endothal and its salts, etobenzanid, flurenol, flurenol-butyl, flurprimidol, fosamine, fosamine-ammonium, indanofan, maleic hydrazide, mefluidide, metam, methiozolin (CAS 403640-27-7), methyl azide, methyl bromide, methyl-dymron, methyl iodide, MSMA, oleic acid, oxaziolomefone, pelargonic acid, pyributicarb, quinoclamine, tridiphane;
- 5
- O) Insecticides from classes O.1 to O.29
- O.1 Acetylcholine esterase (AChE) inhibitors: aldicarb, alanycarb, bendiocarb, benfuracarb, butocarboxim, butoxycarboxim, carbaryl, carbofuran, carbosulfan, ethiofencarb, fenobucarb, formetanate, furathiocarb, isoprocarb, methiocarb, methomyl, metolcarb, oxamyl, pirimicarb, propoxur, thiodicarb, thiofanox, trimethacarb, XMC, xylylcarb and triazamate; acephate, azamethiphos, azinphos-ethyl, azinphosmethyl, cadusafos, chlorethoxyfos, chlorfenvinphos, chlormephos, chlorpyrifos, chlorpyrifos-methyl, coumaphos, cyanophos, demeton-S-methyl, diazinon, dichlorvos/ DDVP, dicrotophos, dimethoate, dimethylvinphos, disulfoton, EPN, ethion, ethoprophos, famphur, fenamiphos, fenitrothion, fenthion, fosthiazate, heptenophos, imicyafos, isofenphos, isopropyl O-(methoxyaminothio-phosphoryl) salicylate, isoxathion, malathion, mecarbam, methamidophos, methidathion, mevinphos, monocrotophos, naled, omethoate, oxidemeton-methyl, parathion, parathion-methyl, phenthoate, phorate, phosalone, phosmet, phosphamidon, phoxim, pirimiphos- methyl, profenofos, propetamphos, prothiofos, pyraclofos, pyridaphenthion, quinalphos, sulfotep, tebupirimfos, temephos, terbufos, tetra-chlorvinphos, thiometon, triazophos, trichlorfon, vamidothion;
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- O.2 GABA-gated chloride channel antagonists: endosulfan, chlordane; ethiprole, fipronil, flufiprole, pyrafluprole, pyriprole;
- 25
- O.3 Sodium channel modulators: acrinathrin, allethrin, d-cis-trans allethrin, d-trans allethrin, bifenthrin, bioallethrin, bioallethrin S-cyclopentenyl, bioresmethrin, cycloprothrin, cyfluthrin, beta-cyfluthrin, cyhalothrin, lambda-cyhalothrin, gamma-cyhalothrin, cypermethrin, alpha-cypermethrin, beta-cypermethrin, theta-cypermethrin, zeta-cypermethrin, cyphenothrin, deltamethrin, empenthrin, esfenvalerate, etofenprox, fenpropathrin, fenvalerate, flucythrinate, flumethrin, tau-fluvalinate, halfenprox, heptafluthrin, imiprothrin, meperfluthrin, metofluthrin, momfluorothrin, permethrin, phenothrin, prallethrin, profluthrin, pyrethrin (pyrethrum), resmethrin, silafluofen, tefluthrin, tetramethylfluthrin, tetramethrin, tralomethrin and transfluthrin; DDT, methoxychlor;
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- 35
- O.4 Nicotinic acetylcholine receptor agonists (nAChR): acetamiprid, clothianidin, cycloxaprid, dinotefuran, imidacloprid, nitenpyram, thiacloprid, thiamethoxam; (2E)-1-[(6-chloropyridin-3-yl)methyl]-N'-nitro-2-pentylidenehydrazinecarboximidamide; 1-[(6-chloropyridin-3-yl)methyl]-7-methyl-8-nitro-5-propoxy-1,2,3,5,6,7-hexahydroimidazo[1,2-a]pyridine; nicotine;
- 40
- O.5 Nicotinic acetylcholine receptor allosteric activators: spinosad, spinetoram;
- O.6 Chloride channel activators: abamectin, emamectin benzoate, ivermectin, lepimectin, milbemectin;

- O.7 Juvenile hormone mimics: hydroprene, kinoprene, methoprene; fenoxycarb, pyriproxyfen;
- O.8 miscellaneous non-specific (multi-site) inhibitors: methyl bromide and other alkyl halides; chloropicrin, sulfuryl fluoride, borax, tartar emetic;
- 5 O.9 Selective homopteran feeding blockers: pymetrozine, flonicamid;
- O.10 Mite growth inhibitors: clofentezine, hexythiazox, diflovidazin; etoxazole;
- O.11 Microbial disruptors of insect midgut membranes: *Bacillus thuringiensis*, *Bacillus sphaericus* and the insecticidal proteins they produce: *Bacillus thuringiensis* subsp. *israelensis*, *Bacillus sphaericus*, *Bacillus thuringiensis* subsp. *aizawai*, *Bacillus thuringiensis* subsp. *kurstaki*, *Bacillus thuringiensis* subsp. *tenebrionis*, the Bt crop proteins: Cry1Ab, Cry1Ac, Cry1Fa, Cry2Ab, mCry3A, Cry3Ab, Cry3Bb, Cry34/35Ab1;
- 10 O.12 Inhibitors of mitochondrial ATP synthase: diafenthiuron; azocyclotin, cyhexatin, fenbutatin oxide, propargite, tetradifon;
- O.13 Uncouplers of oxidative phosphorylation via disruption of the proton gradient:
- 15 chlorfenapyr, DNOC, sulfluramid;
- O.14 Nicotinic acetylcholine receptor (nAChR) channel blockers: bensultap, cartap hydrochloride, thiocyclam, thiosultap sodium;
- O.15 Inhibitors of the chitin biosynthesis type 0: bistrifluron, chlorfluazuron, diflubenzuron, flucycloxuron, flufenoxuron, hexaflumuron, lufenuron, novaluron, noviflumuron,
- 20 teflubenzuron, triflumuron;
- O.16 Inhibitors of the chitin biosynthesis type 1: buprofezin;
- O.17 Moulting disruptors: cyromazine;
- O.18 Ecdyson receptor agonists: methoxyfenozide, tebufenozide, halofenozide, fufenozide, chromafenozide;
- 25 O.19 Octopamin receptor agonists: amitraz;
- O.20 Mitochondrial complex III electron transport inhibitors: hydramethylnon, acequinocyl, fluacrypyrim;
- O.21 Mitochondrial complex I electron transport inhibitors: fenazaquin, fenpyroximate, pyrimidifen, pyridaben, tebufenpyrad, tolfenpyrad; rotenone;
- 30 O.22 Voltage-dependent sodium channel blockers: indoxacarb, metaflumizone, 2-[2-(4-cyanophenyl)-1-[3-(trifluoromethyl)phenyl]ethylidene]-N-[4-(difluoromethoxy)phenyl]-hydrazinecarboxamide, N-(3-chloro-2-methylphenyl)-2-[(4-chlorophenyl)-[4-[methyl(methylsulfonyl)amino]phenyl]methylene]-hydrazinecarboxamide;
- O.23 Inhibitors of the of acetyl CoA carboxylase: spirodiclofen, spiromesifen,
- 35 spirotetramat;
- O.24 Mitochondrial complex IV electron transport inhibitors: aluminium phosphide, calcium phosphide, phosphine, zinc phosphide, cyanide;
- O.25 Mitochondrial complex II electron transport inhibitors: cyenopyrafen, cyflumetofen;
- O.26 Ryanodine receptor-modulators: flubendiamide, chlorantraniliprole, cyantraniliprole, cyclaniliprole, tetraniliprole; (*R*)-3-chloro-N1-{2-methyl-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]phenyl}-N2-(1-methyl-2-methylsulfonylethyl)phthalamide, (*S*)-3-chloro-N1-{2-methyl-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]phenyl}-N2-(1-methyl-2-methylsulfonylethyl)phthalamide, methyl-2-[3,5-dibromo-2-([3-bromo-
- 40

1-(3-chloropyridin-2-yl)-1H-pyrazol-5-yl]carbonyl]amino)benzoyl]-1,2-dimethylhydrazinecarboxylate; N-[4,6-dichloro-2-[(diethyl-lambda-4-sulfanylidene)carbamoyl]-phenyl]-2-(3-chloro-2-pyridyl)-5-(trifluoromethyl)pyrazole-3-carboxamide; N-[4-chloro-2-[(diethyl-lambda-4-sulfanylidene)carbamoyl]-6-methyl-phenyl]-2-(3-chloro-2-pyridyl)-5-(trifluoromethyl)pyrazole-3-carboxamide; N-[4-chloro-2-[(di-2-propyl-lambda-4-sulfanylidene)carbamoyl]-6-methyl-phenyl]-2-(3-chloro-2-pyridyl)-5-(trifluoromethyl)pyrazole-3-carboxamide; N-[4,6-dichloro-2-[(di-2-propyl-lambda-4-sulfanylidene)carbamoyl]-phenyl]-2-(3-chloro-2-pyridyl)-5-(trifluoromethyl)pyrazole-3-carboxamide; N-[4,6-dibromo-2-[(diethyl-lambda-4-sulfanylidene)carbamoyl]-phenyl]-2-(3-chloro-2-pyridyl)-5-(trifluoromethyl)pyrazole-3-carboxamide; N-[2-(5-amino-1,3,4-thiadiazol-2-yl)-4-chloro-6-methylphenyl]-3-bromo-1-(3-chloro-2-pyridinyl)-1H-pyrazole-5-carboxamide; 3-chloro-1-(3-chloro-2-pyridinyl)-N-[2,4-dichloro-6-[[1-cyano-1-methylethyl]amino]carbonyl]phenyl]-1H-pyrazole-5-carboxamide; 3-bromo-N-[2,4-dichloro-6-(methylcarbonyl)phenyl]-1-(3,5-dichloro-2-pyridyl)-1H-pyrazole-5-carboxamide; N-[4-chloro-2-[[1,1-dimethylethyl]amino]carbonyl]-6-methylphenyl]-1-(3-chloro-2-pyridinyl)-3-(fluoromethoxy)-1H-pyrazole-5-carboxamide; cyhalodiamide;

O.27. insecticidal active compounds of unknown or uncertain mode of action: afidopyrophen, afoxolaner, azadirachtin, amidoflumet, benzoximate, bifentazate, broflanilide, bromopropylate, chinomethionat, cryolite, dicloromezotiaz, dicofol, flufenimer, flometoquin, fluensulfone, fluhexafon, fluopyram, flupyradifurone, fluralaner, metoxadiazone, piperonyl butoxide, pyflubumide, pyridalyl, pyrifluquinazon, sulfoxaflor, tiozafafen, triflumezopyrim, 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)sulfinyl]phenyl]-3-(trifluoromethyl)-1H-1,2,4-triazole-5-amine, *Bacillus firmus*; (*E*/*Z*)-N-[1-[(6-chloro-3-pyridyl)methyl]-2-pyridylidene]-2,2,2-trifluoro-acetamide; (*E*/*Z*)-N-[1-[(6-chloro-5-fluoro-3-pyridyl)methyl]-2-pyridylidene]-2,2,2-trifluoro-acetamide; (*E*/*Z*)-2,2,2-trifluoro-N-[1-[(6-fluoro-3-pyridyl)methyl]-2-pyridylidene]acetamide; (*E*/*Z*)-N-[1-[(6-bromo-3-pyridyl)methyl]-2-pyridylidene]-2,2,2-trifluoro-acetamide; (*E*/*Z*)-N-[1-[(6-chloro-3-pyridyl)ethyl]-2-pyridylidene]-2,2,2-trifluoro-acetamide; (*E*/*Z*)-N-[1-[(6-chloro-3-pyridyl)methyl]-2-pyridylidene]-2,2-difluoro-acetamide; (*E*/*Z*)-2-chloro-N-[1-[(6-chloro-3-pyridyl)methyl]-2-pyridylidene]-2,2-difluoro-acetamide; (*E*/*Z*)-N-[1-[(2-chloropyrimidin-5-yl)methyl]-2-pyridylidene]-2,2,2-trifluoro-acetamide; (*E*/*Z*)-N-[1-[(6-chloro-3-pyridyl)methyl]-2-pyridylidene]-2,2,3,3,3-pentafluoro-propanamide.); N-[1-[(6-chloro-3-pyridyl)methyl]-2-pyridylidene]-2,2,2-trifluoro-thioacetamide; N-[1-[(6-chloro-3-pyridyl)methyl]-2-pyridylidene]-2,2,2-trifluoro-N'-isopropyl-acetamidine; fluazaindolizine; 4-[5-(3,5-dichlorophenyl)-5-(trifluoromethyl)-4H-isoxazol-3-yl]-2-methyl-N-(1-oxothietan-3-yl)benzamide; fluxametamide; 5-[3-[2,6-dichloro-4-(3,3-dichloroallyloxy)phenoxy]propoxy]-1H-pyrazole; 3-(benzoylmethylamino)-N-[2-bromo-4-[1,2,2,3,3,3-hexafluoro-1-(trifluoromethyl)propyl]-6-(trifluoromethyl)phenyl]-2-fluoro-benzamide; 3-(benzoylmethylamino)-2-fluoro-N-[2-iodo-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]-6-(trifluoromethyl)phenyl]-benzamide; N-[3-[[[2-iodo-

4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]-6-(trifluoromethyl)phenyl]amino]carbonyl]-  
phenyl]-N-methyl-benzamide; N-[3-[[[2-bromo-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)-  
ethyl]-6-(trifluoromethyl)phenyl]amino]carbonyl]-2-fluorophenyl]-4-fluoro-N-methyl-  
5 benzamide; 4-fluoro-N-[2-fluoro-3-[[[2-iodo-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)-  
ethyl]-6-(trifluoromethyl)phenyl]amino]carbonyl]phenyl]-N-methyl-benzamide; 3-fluoro-  
N-[2-fluoro-3-[[[2-iodo-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]-6-(trifluoromethyl)-  
phenyl]amino]carbonyl]phenyl]-N-methyl-benzamide; 2-chloro-N-[3-[[[2-iodo-4-  
[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]-6-(trifluoromethyl)phenyl]amino]carbonyl]-  
10 phenyl]-3-pyridinecarboxamide; 4-cyano-N-[2-cyano-5-[[[2,6-dibromo-4-[1,2,2,3,3,3-hexa-  
fluoro-1-(trifluoromethyl)propyl]phenyl]carbonyl]phenyl]-2-methyl-benzamide;  
4-cyano-3-[(4-cyano-2-methyl-benzoyl)amino]-N-[2,6-dichloro-4-[1,2,2,3,3,3-hexa-  
fluoro-1-(trifluoromethyl)propyl]phenyl]-2-fluoro-benzamide; N-[5-[[[2-chloro-6-cyano-  
4-[1,2,2,3,3,3-hexafluoro-1-(trifluoromethyl)propyl]phenyl]carbonyl]-2-cyano-phenyl]-  
15 4-cyano-2-methyl-benzamide; N-[5-[[[2-bromo-6-chloro-4-[2,2,2-trifluoro-1-hydroxy-  
1-(trifluoromethyl)ethyl]phenyl]carbonyl]-2-cyano-phenyl]-4-cyano-2-methyl-benz-  
amide; N-[5-[[[2-bromo-6-chloro-4-[1,2,2,3,3,3-hexafluoro-1-(trifluoromethyl)propyl]-  
phenyl]carbonyl]-2-cyano-phenyl]-4-cyano-2-methyl-benzamide; 4-cyano-N-[2-cy-  
ano-5-[[[2,6-dichloro-4-[1,2,2,3,3,3-hexafluoro-1-(trifluoromethyl)propyl]phenyl]carba-  
20 moyl]phenyl]-2-methyl-benzamide; 4-cyano-N-[2-cyano-5-[[[2,6-dichloro-4-[1,2,2,2-te-  
trafluoro-1-(trifluoromethyl)ethyl]phenyl]carbonyl]phenyl]-2-methyl-benzamide;  
N-[5-[[[2-bromo-6-chloro-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]phenyl]carba-  
moyl]-2-cyano-phenyl]-4-cyano-2-methyl-benzamide; 2-(1,3-dioxan-2-yl)-6-[2-(3-pyri-  
dinyl)-5-thiazolyl]-pyridine; 2-[6-[2-(5-fluoro-3-pyridinyl)-5-thiazolyl]-2-pyridinyl]-pyrimi-  
dine; 2-[6-[2-(3-pyridinyl)-5-thiazolyl]-2-pyridinyl]-pyrimidine; N-methylsulfonyl-  
25 6-[2-(3-pyridyl)thiazol-5-yl]pyridine-2-carboxamide; N-methylsulfonyl-6-[2-(3-pyridyl)-  
thiazol-5-yl]pyridine-2-carboxamide; N-ethyl-N-[4-methyl-2-(3-pyridyl)thiazol-5-yl]-  
3-methylthio-propanamide; N-methyl-N-[4-methyl-2-(3-pyridyl)thiazol-5-yl]-3-methyl-  
thio-propanamide; N,2-dimethyl-N-[4-methyl-2-(3-pyridyl)thiazol-5-yl]-3-methylthio-  
propanamide; N-ethyl-2-methyl-N-[4-methyl-2-(3-pyridyl)thiazol-5-yl]-3-methylthio-pro-  
30 panamide; N-[4-chloro-2-(3-pyridyl)thiazol-5-yl]-N-ethyl-2-methyl-3-methylthio-propan-  
amide; N-[4-chloro-2-(3-pyridyl)thiazol-5-yl]-N,2-dimethyl-3-methylthio-propanamide;  
N-[4-chloro-2-(3-pyridyl)thiazol-5-yl]-N-methyl-3-methylthio-propanamide; N-[4-chloro-  
2-(3-pyridyl)thiazol-5-yl]-N-ethyl-3-methylthio-propanamide; 1-[(6-chloro-3-pyridinyl)-  
methyl]-1,2,3,5,6,7-hexahydro-5-methoxy-7-methyl-8-nitro-imidazo[1,2-a]pyridine;  
35 1-[(6-chloropyridin-3-yl)methyl]-7-methyl-8-nitro-1,2,3,5,6,7-hexahydroimidazo-  
[1,2-a]pyridin-5-ol; 1-isopropyl-N,5-dimethyl-N-pyridazin-4-yl-pyrazole-4-carboxamide;  
1-(1,2-dimethylpropyl)-N-ethyl-5-methyl-N-pyridazin-4-yl-pyrazole-4-carboxamide;  
N,5-dimethyl-N-pyridazin-4-yl-1-(2,2,2-trifluoro-1-methyl-ethyl)pyrazole-4-carboxamide;  
1-[1-(1-cyanocyclopropyl)ethyl]-N-ethyl-5-methyl-N-pyridazin-4-yl-pyrazole-4-carbox-  
40 amide; N-ethyl-1-(2-fluoro-1-methyl-propyl)-5-methyl-N-pyridazin-4-yl-pyrazole-4-car-  
boxamide; 1-(1,2-dimethylpropyl)-N,5-dimethyl-N-pyridazin-4-yl-pyrazole-4-carbox-  
amide; 1-[1-(1-cyanocyclopropyl)ethyl]-N,5-dimethyl-N-pyridazin-4-yl-pyrazole-4-car-  
boxamide; N-methyl-1-(2-fluoro-1-methyl-propyl)-5-methyl-N-pyridazin-4-yl-pyrazole-

4-carboxamide; 1-(4,4-difluorocyclohexyl)-N-ethyl-5-methyl-N-pyridazin-4-yl-pyrazole-4-carboxamide; 1-(4,4-difluorocyclohexyl)-N,5-dimethyl-N-pyridazin-4-yl-pyrazole-4-carboxamide, N-(1-methylethyl)-2-(3-pyridinyl)-2H-indazole-4-carboxamide; N-cyclopropyl-2-(3-pyridinyl)-2H-indazole-4-carboxamide; N-cyclohexyl-2-(3-pyridinyl)-2H-indazole-4-carboxamide; 2-(3-pyridinyl)-N-(2,2,2-trifluoroethyl)-2H-indazole-4-carboxamide; 2-(3-pyridinyl)-N-[(tetrahydro-2-furanyl)methyl]-2H-indazole-5-carboxamide; methyl 2-[[2-(3-pyridinyl)-2H-indazol-5-yl]carbonyl]hydrazinecarboxylate; N-[(2,2-difluorocyclopropyl)methyl]-2-(3-pyridinyl)-2H-indazole-5-carboxamide; N-(2,2-difluoropropyl)-2-(3-pyridinyl)-2H-indazole-5-carboxamide; 2-(3-pyridinyl)-N-(2-pyrimidinylmethyl)-2H-indazole-5-carboxamide; N-[(5-methyl-2-pyrazinyl)methyl]-2-(3-pyridinyl)-2H-indazole-5-carboxamide, N-[3-chloro-1-(3-pyridyl)pyrazol-4-yl]-N-ethyl-3-(3,3,3-trifluoropropylsulfanyl)propanamide; N-[3-chloro-1-(3-pyridyl)pyrazol-4-yl]-N-ethyl-3-(3,3,3-trifluoropropylsulfanyl)propanamide; N-[3-chloro-1-(3-pyridyl)pyrazol-4-yl]-3-[(2,2-difluorocyclopropyl)methylsulfanyl]-N-ethyl-propanamide; N-[3-chloro-1-(3-pyridyl)pyrazol-4-yl]-3-[(2,2-difluorocyclopropyl)methylsulfanyl]-N-ethyl-propanamide; sarolaner, lotilaner.

The active substances referred to as component 3, their preparation and their activity e. g. against harmful fungi is known (cf.: <http://www.alanwood.net/pesticides/>); these substances are commercially available. The compounds described by IUPAC nomenclature, their preparation and their pesticidal activity are also known (cf. Can. J. Plant Sci. 48(6), 587-94, 1968; EP-A 141 317; EP-A 152 031; EP-A 226 917; EP-A 243 970; EP-A 256 503; EP-A 428 941; EP-A 532 022; EP-A 1 028 125; EP-A 1 035 122; EP-A 1 201 648; EP-A 1 122 244, JP 2002316902; DE 19650197; DE 10021412; DE 102005009458; US 3,296,272; US 3,325,503; WO 98/46608; WO 99/14187; WO 99/24413; WO 99/27783; WO 00/29404; WO 00/46148; WO 00/65913; WO 01/54501; WO 01/56358; WO 02/22583; WO 02/40431; WO 03/10149; WO 03/11853; WO 03/14103; WO 03/16286; WO 03/53145; WO 03/61388; WO 03/66609; WO 03/74491; WO 04/49804; WO 04/83193; WO 05/120234; WO 05/123689; WO 05/123690; WO 05/63721; WO 05/87772; WO 05/87773; WO 06/15866; WO 06/87325; WO 06/87343; WO 07/82098; WO 07/90624, WO 10/139271, WO 11/028657, WO 12/168188, WO 07/006670, WO 11/77514; WO 13/047749, WO 10/069882, WO 13/047441, WO 03/16303, WO 09/90181, WO 13/007767, WO 13/010862, WO 13/127704, WO 13/024009, WO 13/24010, WO 13/047441, WO 13/162072, WO 13/092224, WO 11/135833, CN 1907024, CN 1456054, CN 103387541, CN 1309897, WO 12/84812, CN 1907024, WO 09094442, WO 14/60177, WO 13/116251, WO 08/013622, WO 15/65922, WO 94/01546, EP 2865265, WO 07/129454, WO 12/165511, WO 11/081174, WO 13/47441).

Preferably, the components 1), 2) and 3) in these mixtures are present in a synergistically effective amount.

The present invention furthermore relates to agrochemical compositions comprising a

mixture of at least one compound I (component 1), at least one pesticide III from the groups A) to O) (component 3), in particular one further fungicide, e. g. one or more fungicide from the groups A) to K), as described above, and if desired one suitable solvent or solid carrier. Those mixtures are of particular interest, since many of them at the same application rate show higher efficiencies against harmful fungi. Furthermore, combating harmful fungi with a mixture of compounds I and at least one fungicide from groups A) to K), as described above, is more efficient than combating those fungi with individual compounds I or individual fungicides from groups A) to K).

When applying compound I and a pesticide II sequentially the time between both applications may vary e. g. between 2 hours to 7 days. Also a broader range is possible ranging from 0.25 hour to 30 days, preferably from 0.5 hour to 14 days, particularly from 1 hour to 7 days or from 1.5 hours to 5 days, even more preferred from 2 hours to 1 day.

In the binary mixtures and compositions according to the invention the weight ratio of the component 1) and the component 2) generally depends from the properties of the active components used, usually it is in the range of from 1:10,000 to 10,000:1, often it is in the range of from 1:100 to 100:1, regularly in the range of from 1:50 to 50:1, preferably in the range of from 1:20 to 20:1, more preferably in the range of from 1:10 to 10:1, even more preferably in the range of from 1:4 to 4:1 and in particular in the range of from 1:2 to 2:1.

According to further embodiments of the binary mixtures and compositions, the weight ratio of the component 1) and the component 2) usually is in the range of from 1000:1 to 1:1, often in the range of from 100:1 to 1:1, regularly in the range of from 50:1 to 1:1, preferably in the range of from 20:1 to 1:1, more preferably in the range of from 10:1 to 1:1, even more preferably in the range of from 4:1 to 1:1 and in particular in the range of from 2:1 to 1:1.

According to further embodiments of the binary mixtures and compositions, the weight ratio of the component 1) and the component 2) usually is in the range of from 1:1 to 1:1000, often in the range of from 1:1 to 1:100, regularly in the range of from 1:1 to 1:50, preferably in the range of from 1:1 to 1:20, more preferably in the range of from 1:1 to 1:10, even more preferably in the range of from 1:1 to 1:4 and in particular in the range of from 1:1 to 1:2.

In the ternary mixtures, i.e. compositions according to the invention comprising the component 1) and component 2) and a pesticide III (component 3), the weight ratio of component 1) and component 2) depends from the properties of the active substances used, usually it is in the range of from 1:100 to 100:1, regularly in the range of from 1:50 to 50:1, preferably in the range of from 1:20 to 20:1, more preferably in the range of from 1:10 to 10:1 and in particular in the range of from 1:4 to 4:1, and the weight ratio of component 1) and component 3) usually it is in the range of from 1:100 to 100:1, regularly in the range of from 1:50 to 50:1, preferably in the range of from 1:20 to 20:1, more preferably in the range of from 1:10 to 10:1 and in particular in the range of from 1:4 to 4:1.

Any further active components are, if desired, added in a ratio of from 20:1 to 1:20 to the component 1).

These ratios are also suitable for inventive mixtures applied by seed treatment.

Preference is also given to mixtures comprising as component 3) at least one active substance selected from inhibitors of complex III at Qo site in group A), more preferably

selected from compounds (A.1.1), (A.1.4), (A.1.8), (A.1.9), (A.1.10), (A.1.12), (A.1.13), (A.1.14), (A.1.17), (A.1.21), (A.1.24), (A.1.25), (A.1.26), (A.1.27), (A.1.28), (A.1.29), (A.1.30), (A.1.31), (A.1.32), (A.1.34) and (A.1.35); particularly selected from (A.1.1), (A.1.4), (A.1.8), (A.1.9), (A.1.13), (A.1.14), (A.1.17), (A.1.24), (A.1.25), (A.1.26), (A.1.27), (A.1.28), (A.1.29), (A.1.30), (A.1.31), (A.1.32), (A.1.34) and (A.1.35).

Preference is also given to mixtures comprising as component 3) at least one active substance selected from inhibitors of complex III at Qi site in group A), more preferably selected from compounds (A.2.1), (A.2.3) and (A.2.4); particularly selected from (A.2.3) and (A.2.4).

Preference is also given to mixtures comprising as component 2) at least one active substance selected from inhibitors of complex II in group A), more preferably selected from compounds (A.3.2), (A.3.3), (A.3.4), (A.3.7), (A.3.9), (A.3.11), (A.3.12), (A.3.15), (A.3.16), (A.3.17), (A.3.18), (A.3.19), (A.3.20), (A.3.21), (A.3.22), (A.3.23), (A.3.24), (A.3.25), (A.3.27), (A.3.28), (A.3.29), (A.3.31), (A.3.32), (A.3.33), (A.3.34), (A.3.35), (A.3.36), (A.3.37), (A.3.38) and (A.3.39); particularly selected from (A.3.2), (A.3.3), (A.3.4), (A.3.7), (A.3.9), (A.3.12), (A.3.15), (A.3.17), (A.3.19), (A.3.22), (A.3.23), (A.3.24), (A.3.25), (A.3.27), (A.3.29), (A.3.31), (A.3.32), (A.3.33), (A.3.34), (A.3.35), (A.3.36), (A.3.37), (A.3.38) and (A.3.39).

Preference is also given to mixtures comprising as component 2) at least one active substance selected from other respiration inhibitors in group A), more preferably selected from compounds (A.4.5) and (A.4.11); in particular (A.4.11).

Preference is also given to mixtures comprising as component 2) at least one active substance selected from C14 demethylase inhibitors in group B), more preferably selected from compounds (B.1.4), (B.1.5), (B.1.8), (B.1.10), (B.1.11), (B.1.12), (B.1.13), (B.1.17), (B.1.18), (B.1.21), (B.1.22), (B.1.23), (B.1.25), (B.1.26), (B.1.29), (B.1.34), (B.1.37), (B.1.38), (B.1.43) and (B.1.46); particularly selected from (B.1.5), (B.1.8), (B.1.10), (B.1.17), (B.1.22), (B.1.23), (B.1.25), (B.1.33), (B.1.34), (B.1.37), (B.1.38), (B.1.43) and (B.1.46).

Preference is also given to mixtures comprising as component 2) at least one active substance selected from Delta14-reductase inhibitors in group B), more preferably selected from compounds (B.2.4), (B.2.5), (B.2.6) and (B.2.8); in particular (B.2.4).

Preference is also given to mixtures comprising as component 2) at least one active substance selected from phenylamides and acyl amino acid fungicides in group C), more preferably selected from compounds (C.1.1), (C.1.2), (C.1.4) and (C.1.5); particularly selected from (C.1.1) and (C.1.4).

Preference is also given to mixtures comprising as component 2) at least one active substance selected from other nucleic acid synthesis inhibitors in group C), more preferably selected from compounds (C.2.6), (C.2.7) and (C.2.8).

Preference is also given to mixtures comprising as component 2) at least one active substance selected from group D), more preferably selected from compounds (D.1.1), (D.1.2), (D.1.5), (D.2.4) and (D.2.6); particularly selected from (D.1.2), (D.1.5) and (D.2.6).

Preference is also given to mixtures comprising as component 2) at least one active substance selected from group E), more preferably selected from compounds (E.1.1), (E.1.3), (E.2.2) and (E.2.3); in particular (E.1.3).

Preference is also given to mixtures comprising as component 2) at least one active substance selected from group F), more preferably selected from compounds (F.1.2), (F.1.4)



and (F.1.5).

Preference is also given to mixtures comprising as component 2) at least one active substance selected from group G), more preferably selected from compounds (G.3.1), (G.3.3), (G.3.6), (G.5.1), (G.5.2), (G.5.3), (G.5.4), (G.5.5), G.5.6), G.5.7), (G.5.8), (G.5.9), (G.5.10) and (G.5.11); particularly selected from (G.3.1), (G.5.1), (G.5.2) and (G.5.3).

Preference is also given to mixtures comprising as component 2) at least one active substance selected from group H), more preferably selected from compounds (H.2.2), (H.2.3), (H.2.5), (H.2.7), (H.2.8), (H.3.2), (H.3.4), (H.3.5), (H.4.9) and (H.4.10); particularly selected from (H.2.2), (H.2.5), (H.3.2), (H.4.9) and (H.4.10).

Preference is also given to mixtures comprising as component 2) at least one active substance selected from group I), more preferably selected from compounds (I.2.2) and (I.2.5).

Preference is also given to mixtures comprising as component 2) at least one active substance selected from group J), more preferably selected from compounds (J.1.2), (J.1.5), and (J.1.8), (J.1.11) and (J.1.12); in particular (J.1.5).

Preference is also given to mixtures comprising as component 2) at least one active substance selected from group K), more preferably selected from compounds (K.1.41), (K.1.42), (K.1.44), (K.1.45), (K.1.47) and (K.1.49); particularly selected from (K.1.41), (K.1.44), (K.1.45), (K.1.47) and (K.1.49).

The mixtures of active substances can be prepared as compositions comprising besides the active ingredients at least one inert ingredient (auxiliary) by usual means, e. g. by the means given for the compositions of compounds I. Concerning usual ingredients of such compositions reference is made to the explanations given for the compositions containing compounds I.

According to one embodiment, the microbial pesticides selected from groups L1), L3) and L5) embrace not only the isolated, pure cultures of the respective microorganism as defined herein, but also its cell-free extract, its suspensions in a whole broth culture or as a metabolite-containing culture medium or a purified metabolite obtained from a whole broth culture of the microorganism.

The mixtures and compositions according to the invention are suitable as fungicides. They are distinguished by an outstanding effectiveness against a broad spectrum of phytopathogenic fungi, including soil-borne fungi, which derive especially from the classes of the Plasmodiophoromycetes, Peronosporomycetes (syn. Oomycetes), Chytridiomycetes, Zygomycetes, Ascomycetes, Basidiomycetes and Deuteromycetes (syn. Fungi imperfecti). Some are systemically effective and they can be used in crop protection as foliar fungicides, fungicides for seed dressing and soil fungicides. Moreover, they are suitable for controlling harmful fungi, which inter alia occur in wood or roots of plants.

The mixtures and compositions according to the invention are particularly important in the control of a multitude of phytopathogenic fungi on various cultivated plants, such as cereals, e. g. wheat, rye, barley, triticale, oats or rice; beet, e. g. sugar beet or fodder beet; fruits, such as pomes, stone fruits or soft fruits, e. g. apples, pears, plums, peaches, almonds, cherries, strawberries, raspberries, blackberries or gooseberries; leguminous plants, such as lentils, peas, alfalfa or soybeans; oil plants, such as rape, mustard, olives, sunflowers, coconut, cocoa

beans, castor oil plants, oil palms, ground nuts or soybeans; cucurbits, such as squashes, cucumber or melons; fiber plants, such as cotton, flax, hemp or jute; citrus fruit, such as oranges, lemons, grapefruits or mandarins; vegetables, such as spinach, lettuce, asparagus, cabbages, carrots, onions, tomatoes, potatoes, cucurbits or paprika; lauraceous plants, such as  
5 avocados, cinnamon or camphor; energy and raw material plants, such as corn, soybean, rape, sugar cane or oil palm; corn; tobacco; nuts; coffee; tea; bananas; vines (table grapes and grape juice grape vines); hop; turf; natural rubber plants or ornamental and forestry plants, such as flowers, shrubs, broad-leaved trees or evergreens, e. g. conifers; and on the plant propagation material, such as seeds, and the crop material of these plants.

10 Preferably the inventive mixtures and compositions are used for controlling a multitude of fungi on field crops, such as potatoes sugar beets, tobacco, wheat, rye, barley, oats, rice, corn, cotton, soybeans, rape, legumes, sunflowers, coffee or sugar cane; fruits; vines; ornamentals; or vegetables, such as cucumbers, tomatoes, beans or squashes.

The term "plant propagation material" is to be understood to denote all the generative parts  
15 of the plant such as seeds and vegetative plant material such as cuttings and tubers (e. g. potatoes), which can be used for the multiplication of the plant. This includes seeds, roots, fruits, tubers, bulbs, rhizomes, shoots, sprouts and other parts of plants, including seedlings and young plants, which are to be transplanted after germination or after emergence from soil. These young plants may also be protected before transplantation by a total or partial treatment  
20 by immersion or pouring.

Preferably, treatment of plant propagation materials with the inventive combination of compound I and pesticides II and compositions thereof, respectively, is used for controlling a multitude of fungi on cereals, such as wheat, rye, barley and oats; rice, corn, cotton and soybeans.

25 The term "cultivated plants" is to be understood as including plants which have been modified by breeding, mutagenesis or genetic engineering including but not limiting to agricultural biotech products on the market or in development (cf. <http://cera-gmc.org/>, see GM crop database therein). Genetically modified plants are plants, which genetic material has been so modified by the use of recombinant DNA techniques that under natural circumstances cannot  
30 readily be obtained by cross breeding, mutations or natural recombination. Typically, one or more genes have been integrated into the genetic material of a genetically modified plant in order to improve certain properties of the plant. Such genetic modifications also include but are not limited to targeted post-translational modification of protein(s), oligo- or polypeptides e. g. by glycosylation or polymer additions such as prenylated, acetylated or farnesylated moieties or  
35 PEG moieties.

Plants that have been modified by breeding, mutagenesis or genetic engineering, e. g. have been rendered tolerant to applications of specific classes of herbicides, such as hydroxyphenylpyruvate dioxygenase (HPPD) inhibitors; acetolactate synthase (ALS) inhibitors, such as sulfonyl ureas (see e. g. US 6,222,100, WO 01/82685, WO 00/26390, WO 97/41218,  
40 WO 98/02526, WO 98/02527, WO 04/106529, WO 05/20673, WO 03/14357, WO 03/13225, WO 03/14356, WO 04/16073) or imidazolinones (see e. g. US 6,222,100, WO 01/82685, WO 00/26390, WO 97/41218, WO 98/002526, WO 98/02527, WO 04/106529, WO 05/20673, WO 03/014357, WO 03/13225, WO 03/14356, WO 04/16073); enolpyruvylshikimate-3-

phosphate synthase (EPSPS) inhibitors, such as glyphosate (see e. g. WO 92/00377); glutamine synthetase (GS) inhibitors, such as glufosinate (see e.g. EP-A 242 236, EP-A 242 246) or oxynil herbicides (see e. g. US 5,559,024) as a result of conventional methods of breeding or genetic engineering. Several cultivated plants have been rendered tolerant to herbicides by conventional methods of breeding (mutagenesis), e. g. Clearfield® summer rape (Canola, BASF SE, Germany) being tolerant to imidazolinones, e. g. imazamox. Genetic engineering methods have been used to render cultivated plants such as soybean, cotton, corn, beets and rape, tolerant to herbicides such as glyphosate and glufosinate, some of which are commercially available under the trade names RoundupReady® (glyphosate-tolerant, Monsanto, U.S.A.) and LibertyLink® (glufosinate-tolerant, Bayer CropScience, Germany).

Furthermore, plants are also covered that are by the use of recombinant DNA techniques capable to synthesize one or more insecticidal proteins, especially those known from the bacterial genus *Bacillus*, particularly from *Bacillus thuringiensis*, such as  $\delta$ -endotoxins, e. g. CryIA(b), CryIA(c), CryIF, CryIF(a2), CryIIA(b), CryIIIA, CryIIIB(b1) or Cry9c; vegetative insecticidal proteins (VIP), e. g. VIP1, VIP2, VIP3 or VIP3A; insecticidal proteins of bacteria colonizing nematodes, e. g. *Photorhabdus* spp. or *Xenorhabdus* spp.; toxins produced by animals, such as scorpion toxins, arachnid toxins, wasp toxins, or other insect-specific neurotoxins; toxins produced by fungi, such Streptomycetes toxins, plant lectins, such as pea or barley lectins; agglutinins; proteinase inhibitors, such as trypsin inhibitors, serine protease inhibitors, patatin, cystatin or papain inhibitors; ribosome-inactivating proteins (RIP), such as ricin, maize-RIP, abrin, luffin, saporin or bryodin; steroid metabolism enzymes, such as 3-hydroxysteroid oxidase, ecdysteroid-IDP-glycosyl-transferase, cholesterol oxidases, ecdysone inhibitors or HMG-CoA-reductase; ion channel blockers, such as blockers of sodium or calcium channels; juvenile hormone esterase; diuretic hormone receptors (helicokinin receptors); stilben synthase, bibenzyl synthase, chitinases or glucanases. In the context of the present invention these insecticidal proteins or toxins are to be understood expressly also as pre-toxins, hybrid proteins, truncated or otherwise modified proteins. Hybrid proteins are characterized by a new combination of protein domains, (see, e. g. WO 02/015701). Further examples of such toxins or genetically modified plants capable of synthesizing such toxins are disclosed, e. g., in EP-A 374 753, WO 93/007278, WO 95/34656, EP-A 427 529, EP-A 451 878, WO 03/18810 und WO 03/52073. The methods for producing such genetically modified plants are generally known to the person skilled in the art and are described, e. g. in the publications mentioned above. These insecticidal proteins contained in the genetically modified plants impart to the plants producing these proteins tolerance to harmful pests from all taxonomic groups of athropods, especially to beetles (Coeloptera), two-winged insects (Diptera), and moths (Lepidoptera) and to nematodes (Nematoda). Genetically modified plants capable to synthesize one or more insecticidal proteins are, e. g., described in the publications mentioned above, and some of which are commercially available such as YieldGard® (corn cultivars producing the Cry1Ab toxin), YieldGard® Plus (corn cultivars producing Cry1Ab and Cry3Bb1 toxins), Starlink® (corn cultivars producing the Cry9c toxin), Herculex® RW (corn cultivars producing Cry34Ab1, Cry35Ab1 and the enzyme Phosphinothricin-*N*-Acetyltransferase [PAT]); NuCOTN® 33B (cotton cultivars producing the Cry1Ac toxin), Bollgard® I (cotton cultivars producing the Cry1Ac toxin), Bollgard® II (cotton cultivars producing Cry1Ac and Cry2Ab2 toxins); VIPCOT® (cotton cultivars

producing a VIP-toxin); NewLeaf® (potato cultivars producing the Cry3A toxin); Bt-Xtra®, NatureGard®, KnockOut®, BiteGard®, Protecta®, Bt11 (e. g. Agrisure® CB) and Bt176 from Syngenta Seeds SAS, France, (corn cultivars producing the Cry1Ab toxin and PAT enzyme), MIR604 from Syngenta Seeds SAS, France (corn cultivars producing a modified version of the  
5 Cry3A toxin, c.f. WO 03/018810), MON 863 from Monsanto Europe S.A., Belgium (corn cultivars producing the Cry3Bb1 toxin), IPC 531 from Monsanto Europe S.A., Belgium (cotton cultivars producing a modified version of the Cry1Ac toxin) and 1507 from Pioneer Overseas Corporation, Belgium (corn cultivars producing the Cry1F toxin and PAT enzyme).

Furthermore, plants are also covered that are by the use of recombinant DNA techniques  
10 capable to synthesize one or more proteins to increase the resistance or tolerance of those plants to bacterial, viral or fungal pathogens. Examples of such proteins are the so-called “pathogenesis-related proteins” (PR proteins, see, e. g. EP-A 392 225), plant disease resistance genes (e. g. potato cultivars, which express resistance genes acting against *Phytophthora infestans* derived from the mexican wild potato *Solanum bulbocastanum*) or T4-lysozym (e. g.  
15 potato cultivars capable of synthesizing these proteins with increased resistance against bacteria such as *Erwinia amylovora*). The methods for producing such genetically modified plants are generally known to the person skilled in the art and are described, e. g. in the publications mentioned above.

Furthermore, plants are also covered that are by the use of recombinant DNA techniques  
20 capable to synthesize one or more proteins to increase the productivity (e. g. bio mass production, grain yield, starch content, oil content or protein content), tolerance to drought, salinity or other growth-limiting environmental factors or tolerance to pests and fungal, bacterial or viral pathogens of those plants.

Furthermore, plants are also covered that contain by the use of recombinant DNA techniques  
25 a modified amount of substances of content or new substances of content, specifically to improve human or animal nutrition, e. g. oil crops that produce health-promoting long-chain omega-3 fatty acids or unsaturated omega-9 fatty acids (e. g. Nexera® rape, DOW Agro Sciences, Canada).

Furthermore, plants are also covered that contain by the use of recombinant DNA techniques  
30 a modified amount of substances of content or new substances of content, specifically to improve raw material production, e. g. potatoes that produce increased amounts of amylopectin (e. g. Amflora® potato, BASF SE, Germany).

The inventive mixtures and compositions are particularly suitable for controlling the following plant diseases:

35 *Albugo* spp. (white rust) on ornamentals, vegetables (e. g. *A. candida*) and sunflowers (e. g. *A. tragopogonis*); *Alternaria* spp. (Alternaria leaf spot) on vegetables, rape (*A. brassicola* or *brassicae*), sugar beets (*A. tenuis*), fruits, rice, soybeans, potatoes (e. g. *A. solani* or *A. alternata*), tomatoes (e. g. *A. solani* or *A. alternata*) and wheat; *Aphanomyces* spp. on sugar beets and vegetables; *Ascochyta* spp. on cereals and vegetables, e. g. *A. tritici* (anthracnose)  
40 on wheat and *A. hordei* on barley; *Bipolaris* and *Drechslera* spp. (teleomorph: *Cochliobolus* spp.) on corn (e. g. *D. maydis*), cereals (e. g. *B. sorokiniana*: spot blotch), rice (e. g. *B. oryzae*) and turfs; *Blumeria* (formerly *Erysiphe*) *graminis* (powdery mildew) on cereals (e. g. on wheat or barley); *Botrytis cinerea* (teleomorph: *Botryotinia fuckeliana*: grey mold) on fruits and berries

(e. g. strawberries), vegetables (e. g. lettuce, carrots, celery and cabbages), rape, flowers, vines, forestry plants and wheat; *Bremia lactucae* (downy mildew) on lettuce;

*Ceratocystis* (syn. *Ophiostoma*) spp. (rot or wilt) on broad-leaved trees and evergreens, e. g. *C. ulmi* (Dutch elm disease) on elms; *Cercospora* spp. (*Cercospora* leaf spots) on corn, rice, 5 sugar beets (e. g. *C. beticola*), sugar cane, vegetables, coffee, soybeans (e. g. *C. sojina* or *C. kikuchii*) and rice; *Cladosporium* spp. on tomatoes (e. g. *C. fulvum*: leaf mold) and cereals, e. g. *C. herbarum* (black ear) on wheat; *Claviceps purpurea* (ergot) on cereals; *Cochliobolus* (anamorph: *Helminthosporium* of *Bipolaris*) spp. (leaf spots) on corn (*C. carbonum*), cereals (e. g. *C. sativus*, anamorph: *B. sorokiniana*) and rice (e. g. *C. miyabeanus*, anamorph: *H.* 10 *oryzae*); *Colletotrichum* (teleomorph: *Glomerella*) spp. (anthracnose) on cotton (e. g. *C. gossypii*), corn (e. g. *C. graminicola*), soft fruits, potatoes (e. g. *C. coccodes*: black dot), beans (e. g. *C. lindemuthianum*) and soybeans (e. g. *C. truncatum* or *C. gloeosporioides*); *Corticium* spp., e. g. *C. sasakii* (sheath blight) on rice; *Corynespora cassiicola* (leaf spots) on soybeans and ornamentals; *Cycloconium* spp., e. g. *C. oleaginum* on olive trees; *Cylindrocarpon* spp. 15 (e. g. fruit tree canker or young vine decline, teleomorph: *Nectria* or *Neonectria* spp.) on fruit trees, vines (e. g. *C. liriodendri*, teleomorph: *Neonectria liriodendri*. Black Foot Disease) and ornamentals; *Dematophora* (teleomorph: *Rosellinia*) necatrix (root and stem rot) on soybeans; *Diaporthe* spp., e. g. *D. phaseolorum* (damping off) on soybeans; *Drechslera* (syn. *Helminthosporium*, teleomorph: *Pyrenophora*) spp. on corn, cereals, such as barley (e. g. *D.* 20 *teres*, net blotch) and wheat (e. g. *D. tritici-repentis*: tan spot), rice and turf; Esca (dieback, apoplexy) on vines, caused by *Formitiporia* (syn. *Phellinus*) *punctata*, *F. mediterranea*, *Phaeomoniella chlamydospora* (earlier *Phaeoacremonium chlamydosporum*), *Phaeoacremonium aleophilum* and/or *Botryosphaeria obtusa*; *Elsinoe* spp. on pome fruits (*E. pyri*), soft fruits (*E. veneta*: anthracnose) and vines (*E. ampelina*: anthracnose); *Entyloma* 25 *oryzae* (leaf smut) on rice; *Epicoccum* spp. (black mold) on wheat; *Erysiphe* spp. (powdery mildew) on sugar beets (*E. betae*), vegetables (e. g. *E. pisi*), such as cucurbits (e. g. *E. cichoracearum*), cabbages, rape (e. g. *E. cruciferarum*); *Eutypa lata* (*Eutypa* canker or dieback, anamorph: *Cytosporina lata*, syn. *Libertella blepharis*) on fruit trees, vines and ornamental woods; *Exserohilum* (syn. *Helminthosporium*) spp. on corn (e. g. *E. turcicum*); *Fusarium* 30 (teleomorph: *Gibberella*) spp. (wilt, root or stem rot) on various plants, such as *F. graminearum* or *F. culmorum* (root rot, scab or head blight) on cereals (e. g. wheat or barley), *F. oxysporum* on tomatoes, *F. solani* (f. sp. *glycines* now syn. *F. virguliforme*) and *F. tucumaniae* and *F. brasiliense* each causing sudden death syndrome on soybeans, and *F. verticillioides* on corn; *Gaeumannomyces graminis* (take-all) on cereals (e. g. wheat or barley) and corn; *Gibberella* 35 spp. on cereals (e. g. *G. zaeae*) and rice (e. g. *G. fujikuroi*: Bakanae disease); *Glomerella cingulata* on vines, pome fruits and other plants and *G. gossypii* on cotton; Grainstaining complex on rice; *Guignardia bidwellii* (black rot) on vines; *Gymnosporangium* spp. on rosaceous plants and junipers, e. g. *G. sabinae* (rust) on pears; *Helminthosporium* spp. (syn. *Drechslera*, teleomorph: *Cochliobolus*) on corn, cereals and rice; *Hemileia* spp., e. g. *H. vastatrix* (coffee leaf 40 rust) on coffee; *Isariopsis clavispora* (syn. *Cladosporium vitis*) on vines; *Macrophomina phaseolina* (syn. *phaseoli*) (root and stem rot) on soybeans and cotton; *Microdochium* (syn. *Fusarium*) *nivale* (pink snow mold) on cereals (e. g. wheat or barley); *Microsphaera diffusa* (powdery mildew) on soybeans; *Monilinia* spp., e. g. *M. laxa*, *M. fructicola* and *M. fructigena*

(bloom and twig blight, brown rot) on stone fruits and other rosaceous plants; *Mycosphaerella* spp. on cereals, bananas, soft fruits and ground nuts, such as e. g. *M. graminicola* (anamorph: *Septoria tritici*, Septoria blotch) on wheat or *M. fijiensis* (black Sigatoka disease) on bananas; *Peronospora* spp. (downy mildew) on cabbage (e. g. *P. brassicae*), rape (e. g. *P. parasitica*),  
5 onions (e. g. *P. destructor*), tobacco (*P. tabacina*) and soybeans (e. g. *P. manshurica*);  
*Phakopsora pachyrhizi* and *P. meibomia* (soybean rust) on soybeans; *Phialophora* spp. e. g. on vines (e. g. *P. tracheiphila* and *P. tetraspora*) and soybeans (e. g. *P. gregata*: stem rot);  
*Phoma lingam* (root and stem rot) on rape and cabbage and *P. betae* (root rot, leaf spot and damping-off) on sugar beets; *Phomopsis* spp. on sunflowers, vines (e. g. *P. viticola*: can and  
10 leaf spot) and soybeans (e. g. stem rot: *P. phaseoli*, teleomorph: *Diaporthe phaseolorum*);  
*Physoderma maydis* (brown spots) on corn; *Phytophthora* spp. (wilt, root, leaf, fruit and stem root) on various plants, such as paprika and cucurbits (e. g. *P. capsici*), soybeans (e. g. *P. megasperma*, syn. *P. sojae*), potatoes and tomatoes (e. g. *P. infestans*: late blight) and broad-leaved trees (e. g. *P. ramorum*: sudden oak death); *Plasmiodiophora brassicae* (club root) on  
15 cabbage, rape, radish and other plants; *Plasmopara* spp., e. g. *P. viticola* (grapevine downy mildew) on vines and *P. halstedii* on sunflowers; *Podosphaera* spp. (powdery mildew) on rosaceous plants, hop, pome and soft fruits, e. g. *P. leucotricha* on apples; *Polymyxa* spp., e. g. on cereals, such as barley and wheat (*P. graminis*) and sugar beets (*P. betae*) and thereby transmitted viral diseases; *Pseudocercospora herpotrichoides* (eyespot, teleomorph: *Tapesia*  
20 *yallundae*) on cereals, e. g. wheat or barley; *Pseudoperonospora* (downy mildew) on various plants, e. g. *P. cubensis* on cucurbits or *P. humili* on hop; *Pseudopezizcula tracheiphila* (red fire disease or 'rotbrenner', anamorph: *Phialophora*) on vines; *Puccinia* spp. (rusts) on various plants, e. g. *P. triticina* (brown or leaf rust), *P. striiformis* (stripe or yellow rust), *P. hordei* (dwarf rust), *P. graminis* (stem or black rust) or *P. recondita* (brown or leaf rust) on cereals, such as  
25 e. g. wheat, barley or rye, and asparagus (e. g. *P. asparagi*); *Pyrenophora* (anamorph: *Drechslera*) *tritici-repentis* (tan spot) on wheat or *P. teres* (net blotch) on barley; *Pyricularia* spp., e. g. *P. oryzae* (teleomorph: *Magnaporthe grisea*, rice blast) on rice and *P. grisea* on turf and cereals; *Pythium* spp. (damping-off) on turf, rice, corn, wheat, cotton, rape, sunflowers, soybeans, sugar beets, vegetables and various other plants (e. g. *P. ultimum* or *P. aphanidermatum*);  
30 *Ramularia* spp., e. g. *R. collo-cygni* (Ramularia leaf spots, Physiological leaf spots) on barley and *R. beticola* on sugar beets; *Rhizoctonia* spp. on cotton, rice, potatoes, turf, corn, rape, potatoes, sugar beets, vegetables and various other plants, e. g. *R. solani* (root and stem rot) on soybeans, *R. solani* (sheath blight) on rice or *R. cerealis* (Rhizoctonia spring blight) on wheat or barley; *Rhizopus stolonifer* (black mold, soft rot) on strawberries, carrots, cabbage,  
35 vines and tomatoes; *Rhynchosporium secalis* (scald) on barley, rye and triticale; *Sarocladium oryzae* and *S. attenuatum* (sheath rot) on rice; *Sclerotinia* spp. (stem rot or white mold) on vegetables and field crops, such as rape, sunflowers (e. g. *S. sclerotiorum*) and soybeans (e. g. *S. rolfsii* or *S. sclerotiorum*); *Septoria* spp. on various plants, e. g. *S. glycines* (brown spot) on soybeans, *S. tritici* (Septoria blotch) on wheat and *S.* (syn. *Stagonospora*) *nodorum*  
40 (Stagonospora blotch) on cereals; *Uncinula* (syn. *Erysiphe*) *necator* (powdery mildew, anamorph: *Oidium tuckeri*) on vines; *Setospaeria* spp. (leaf blight) on corn (e. g. *S. turcicum*, syn. *Helminthosporium turcicum*) and turf; *Sphacelotheca* spp. (smut) on corn, (e. g. *S. reiliana*: head smut), sorghum und sugar cane; *Sphaerotheca fuliginea* (powdery mildew) on cucurbits;

*Spongospora subterranea* (powdery scab) on potatoes and thereby transmitted viral diseases; *Stagonospora* spp. on cereals, e. g. *S. nodorum* (Stagonospora blotch, teleomorph: *Leptosphaeria* [syn. *Phaeosphaeria*] *nodorum*) on wheat; *Synchytrium endobioticum* on potatoes (potato wart disease); *Taphrina* spp., e. g. *T. deformans* (leaf curl disease) on peaches  
5 and *T. pruni* (plum pocket) on plums; *Thielaviopsis* spp. (black root rot) on tobacco, pome fruits, vegetables, soybeans and cotton, e. g. *T. basicola* (syn. *Chalara elegans*); *Tilletia* spp. (common bunt or stinking smut) on cereals, such as e. g. *T. tritici* (syn. *T. caries*, wheat bunt) and *T. controversa* (dwarf bunt) on wheat; *Typhula incarnata* (grey snow mold) on barley or wheat; *Urocystis* spp., e. g. *U. occulta* (stem smut) on rye; *Uromyces* spp. (rust) on vegetables,  
10 such as beans (e. g. *U. appendiculatus*, syn. *U. phaseoli*) and sugar beets (e. g. *U. betae*); *Ustilago* spp. (loose smut) on cereals (e. g. *U. nuda* and *U. avenae*), corn (e. g. *U. maydis*: corn smut) and sugar cane; *Venturia* spp. (scab) on apples (e. g. *V. inaequalis*) and pears; and *Verticillium* spp. (wilt) on various plants, such as fruits and ornamentals, vines, soft fruits, vegetables and field crops, e. g. *V. dahliae* on strawberries, rape, potatoes and tomatoes.

15 The inventive mixtures and compositions are also suitable for controlling harmful fungi in the protection of stored products or harvest and in the protection of materials. The term "protection of materials" is to be understood to denote the protection of technical and non-living materials, such as adhesives, glues, wood, paper and paperboard, textiles, leather, paint dispersions, plastics, colling lubricants, fiber or fabrics, against the infestation and destruction by harmful  
20 microorganisms, such as fungi and bacteria. As to the protection of wood and other materials, the particular attention is paid to the following harmful fungi: Ascomycetes such as *Ophiostoma* spp., *Ceratocystis* spp., *Aureobasidium pullulans*, *Sclerophoma* spp., *Chaetomium* spp., *Humicola* spp., *Petriella* spp., *Trichurus* spp.; Basidiomycetes such as *Coniophora* spp., *Coriolus* spp., *Gloeophyllum* spp., *Lentinus* spp., *Pleurotus* spp., *Poria* spp., *Serpula* spp. and  
25 *Tyromyces* spp., Deuteromycetes such as *Aspergillus* spp., *Cladosporium* spp., *Penicillium* spp., *Trichormia* spp., *Alternaria* spp., *Paecilomyces* spp. and Zygomycetes such as *Mucor* spp., and in addition in the protection of stored products and harvest the following yeast fungi are worthy of note: *Candida* spp. and *Saccharomyces cerevisiae*.

30 In particular, the mixtures and compositions of the present invention are effective against plant pathogens in speciality crops such as vine, fruits, hop, vegetables and tobacco - see the above list.

Plant propagation materials may be treated with the mixtures and compositions of the invention prophylactically either at or before planting or transplanting.

35 The invention also relates to agrochemical compositions comprising an auxiliary and at least one compound I and at least one pesticide II according to the invention.

An agrochemical composition comprises a fungicidally effective amount of a compound I and a pesticide II. The term "effective amount" denotes an amount of the composition or of the compounds I, which is sufficient for controlling harmful fungi on cultivated plants or in the protection of materials and which does not result in a substantial damage to the treated plants.  
40 Such an amount can vary in a broad range and is dependent on various factors, such as the fungal species to be controlled, the treated cultivated plant or material, the climatic conditions and the specific compound I used.

The compounds I and II, their N-oxides and salts can be converted into customary types of

agrochemical compositions, e. g. solutions, emulsions, suspensions, dusts, powders, pastes, granules, pressings, capsules, and mixtures thereof. Examples for composition types are suspensions (e.g. SC, OD, FS), emulsifiable concentrates (e.g. EC), emulsions (e.g. EW, EO, ES, ME), capsules (e.g. CS, ZC), pastes, pastilles, wettable powders or dusts (e.g. WP, SP, 5 WS, DP, DS), pressings (e.g. BR, TB, DT), granules (e.g. WG, SG, GR, FG, GG, MG), insecticidal articles (e.g. LN), as well as gel formulations for the treatment of plant propagation materials such as seeds (e.g. GF). These and further compositions types are defined in the “Catalogue of pesticide formulation types and international coding system”, Technical Monograph No. 2, 6<sup>th</sup> Ed. May 2008, CropLife International.

10 The compositions are prepared in a known manner, such as described by Mollet and Grubemann, Formulation technology, Wiley VCH, Weinheim, 2001; or Knowles, New developments in crop protection product formulation, Agrow Reports DS243, T&F Informa, London, 2005.

Suitable auxiliaries are solvents, liquid carriers, solid carriers or fillers, surfactants, 15 dispersants, emulsifiers, wetters, adjuvants, solubilizers, penetration enhancers, protective colloids, adhesion agents, thickeners, humectants, repellents, attractants, feeding stimulants, compatibilizers, bactericides, anti-freezing agents, anti-foaming agents, colorants, tackifiers and binders.

Suitable solvents and liquid carriers are water and organic solvents, such as mineral oil 20 fractions of medium to high boiling point, e.g. kerosene, diesel oil; oils of vegetable or animal origin; aliphatic, cyclic and aromatic hydrocarbons, e. g. toluene, paraffin, tetrahydronaphthalene, alkylated naphthalenes; alcohols, e.g. ethanol, propanol, butanol, benzylalcohol, cyclohexanol; glycols; DMSO; ketones, e.g. cyclohexanone; esters, e.g. lactates, carbonates, fatty acid esters, gamma-butyrolactone; fatty acids; phosphonates; amines; amides, 25 e.g. N-methylpyrrolidone, fatty acid dimethylamides; and mixtures thereof.

Suitable solid carriers or fillers are mineral earths, e.g. silicates, silica gels, talc, kaolins, limestone, lime, chalk, clays, dolomite, diatomaceous earth, bentonite, calcium sulfate, magnesium sulfate, magnesium oxide; polysaccharides, e.g. cellulose, starch; fertilizers, e.g. ammonium sulfate, ammonium phosphate, ammonium nitrate, ureas; products of vegetable 30 origin, e.g. cereal meal, tree bark meal, wood meal, nutshell meal, and mixtures thereof.

Suitable surfactants are surface-active compounds, such as anionic, cationic, nonionic and amphoteric surfactants, block polymers, polyelectrolytes, and mixtures thereof. Such surfactants can be used as emulsifier, dispersant, solubilizer, wetter, penetration enhancer, protective colloid, or adjuvant. Examples of surfactants are listed in McCutcheon's, Vol.1: Emulsifiers & 35 Detergents, McCutcheon's Directories, Glen Rock, USA, 2008 (International Ed. or North American Ed.).

Suitable anionic surfactants are alkali, alkaline earth or ammonium salts of sulfonates, sulfates, phosphates, carboxylates, and mixtures thereof. Examples of sulfonates are alkylarylsulfonates, diphenylsulfonates, alpha-olefin sulfonates, lignine sulfonates, sulfonates of 40 fatty acids and oils, sulfonates of ethoxylated alkylphenols, sulfonates of alkoxyated arylphenols, sulfonates of condensed naphthalenes, sulfonates of dodecyl- and tridecylbenzenes, sulfonates of naphthalenes and alkyl naphthalenes, sulfosuccinates or sulfosuccinamates. Examples of sulfates are sulfates of fatty acids and oils, of ethoxylated



alkylphenols, of alcohols, of ethoxylated alcohols, or of fatty acid esters. Examples of phosphates are phosphate esters. Examples of carboxylates are alkyl carboxylates, and carboxylated alcohol or alkylphenol ethoxylates.

5 Suitable nonionic surfactants are alkoxyates, N-substituted fatty acid amides, amine oxides, esters, sugar-based surfactants, polymeric surfactants, and mixtures thereof. Examples of alkoxyates are compounds such as alcohols, alkylphenols, amines, amides, arylphenols, fatty acids or fatty acid esters which have been alkoxyated with 1 to 50 equivalents. Ethylene oxide and/or propylene oxide may be employed for the alkoxylation, preferably ethylene oxide. Examples of N-substituted fatty acid amides are fatty acid glucamides or fatty acid  
10 alkanolamides. Examples of esters are fatty acid esters, glycerol esters or monoglycerides. Examples of sugar-based surfactants are sorbitans, ethoxylated sorbitans, sucrose and glucose esters or alkylpolyglucosides. Examples of polymeric surfactants are home- or copolymers of vinylpyrrolidone, vinylalcohols, or vinylacetate.

15 Suitable cationic surfactants are quaternary surfactants, for example quaternary ammonium compounds with one or two hydrophobic groups, or salts of long-chain primary amines. Suitable amphoteric surfactants are alkylbetains and imidazolines. Suitable block polymers are block polymers of the A-B or A-B-A type comprising blocks of polyethylene oxide and polypropylene oxide, or of the A-B-C type comprising alkanol, polyethylene oxide and polypropylene oxide. Suitable polyelectrolytes are polyacids or polybases. Examples of polyacids are alkali salts of  
20 polyacrylic acid or polyacid comb polymers. Examples of polybases are polyvinylamines or polyethyleneamines.

Suitable adjuvants are compounds, which have a neglectable or even no pesticidal activity themselves, and which improve the biological performance of the compound I on the target. Examples are surfactants, mineral or vegetable oils, and other auxiliaries. Further examples are  
25 listed by Knowles, Adjuvants and additives, Agrow Reports DS256, T&F Informa UK, 2006, chapter 5.

Suitable thickeners are polysaccharides (e.g. xanthan gum, carboxymethylcellulose), anorganic clays (organically modified or unmodified), polycarboxylates, and silicates.

30 Suitable bactericides are bronopol and isothiazolinone derivatives such as alkylisothiazolinones and benzisothiazolinones.

Suitable anti-freezing agents are ethylene glycol, propylene glycol, urea and glycerin.

Suitable anti-foaming agents are silicones, long chain alcohols, and salts of fatty acids.

35 Suitable colorants (e.g. in red, blue, or green) are pigments of low water solubility and water-soluble dyes. Examples are inorganic colorants (e.g. iron oxide, titan oxide, iron hexacyanoferrate) and organic colorants (e.g. alizarin-, azo- and phthalocyanine colorants).

Suitable tackifiers or binders are polyvinylpyrrolidons, polyvinylacetates, polyvinyl alcohols, polyacrylates, biological or synthetic waxes, and cellulose ethers.

40 The agrochemical compositions generally comprise between 0.01 and 95%, preferably between 0.1 and 90%, and in particular between 0.5 and 75%, by weight of active substances. The active substances are employed in a purity of from 90% to 100%, preferably from 95% to 100% (according to NMR spectrum).

Solutions for seed treatment (LS), Suspoemulsions (SE), flowable concentrates (FS), powders for dry treatment (DS), water-dispersible powders for slurry treatment (WS), water-

soluble powders (SS), emulsions (ES), emulsifiable concentrates (EC) and gels (GF) are usually employed for the purposes of treatment of plant propagation materials, particularly seeds. The compositions in question give, after two-to-tenfold dilution, active substance concentrations of from 0.01 to 60% by weight, preferably from 0.1 to 40%, in the ready-to-use preparations.

5 Application can be carried out before or during sowing. Methods for applying or treating compound I and pesticide II and compositions thereof, respectively, on to plant propagation material, especially seeds include dressing, coating, pelleting, dusting, soaking and in-furrow application methods of the propagation material. Preferably, compound I and pesticide II or the compositions thereof, respectively, are applied on to the plant propagation material by a method  
10 such that germination is not induced, e. g. by seed dressing, pelleting, coating and dusting.

When employed in plant protection, the amounts of active substances applied are, depending on the kind of effect desired, from 0.001 to 2 kg per ha, preferably from 0.005 to 2 kg per ha, more preferably from 0.05 to 0.9 kg per ha, in particular from 0.1 to 0.75 kg per ha.

15 In treatment of plant propagation materials such as seeds, e. g. by dusting, coating or drenching seed, amounts of active substance of from 0.1 to 1000 g, preferably from 1 to 1000 g, more preferably from 1 to 100 g and most preferably from 5 to 100 g, per 100 kilogram of plant propagation material (preferably seed) are generally required.

When used in the protection of materials or stored products, the amount of active substance  
20 applied depends on the kind of application area and on the desired effect. Amounts customarily applied in the protection of materials are 0.001 g to 2 kg, preferably 0.005 g to 1 kg, of active substance per cubic meter of treated material.

Various types of oils, wetters, adjuvants, fertilizer, or micronutrients, and further pesticides (e.g. herbicides, insecticides, fungicides, growth regulators, safeners) may be added to the  
25 active substances or the compositions comprising them as premix or, if appropriate not until immediately prior to use (tank mix). These agents can be admixed with the compositions according to the invention in a weight ratio of 1:100 to 100:1, preferably 1:10 to 10:1.

The user applies the composition according to the invention usually from a predosage device, a knapsack sprayer, a spray tank, a spray plane, or an irrigation system. Usually, the  
30 agrochemical composition is made up with water, buffer, and/or further auxiliaries to the desired application concentration and the ready-to-use spray liquor or the agrochemical composition according to the invention is thus obtained. Usually, 20 to 2000 liters, preferably 50 to 400 liters, of the ready-to-use spray liquor are applied per hectare of agricultural useful area.

According to one embodiment, individual components of the composition according to the  
35 invention such as parts of a kit or parts of a binary or ternary mixture may be mixed by the user himself in a spray tank and further auxiliaries may be added, if appropriate.

In the ternary mixtures, i.e. compositions according to the invention comprising one compound I (component 1) and a pesticide II (component 2) and a pesticide III (component 3), the weight ratio of component 1) and component 2) depends from the properties of the active  
40 substances used, usually it is in the range of from 1:100 to 100:1, regularly in the range of from 1:50 to 50:1, preferably in the range of from 1:20 to 20:1, more preferably in the range of from 1:10 to 10:1 and in particular in the range of from 1:4 to 4:1, and the weight ratio of component 1) and component 3) usually it is in the range of from 1:100 to 100:1, regularly in the range of

from 1:50 to 50:1, preferably in the range of from 1:20 to 20:1, more preferably in the range of from 1:10 to 10:1 and in particular in the range of from 1:4 to 4:1.

Any further active components are, if desired, added in a ratio of from 20:1 to 1:20 to the compound I.

5 In the mixtures and compositions, the compound ratios (e. g. compound I/pesticide II/pesticide III ratio) are advantageously chosen so as to produce a synergistic effect.

The term "synergistic effect" is understood to refer in particular to that defined by Colby's formula (Colby, S. R., "Calculating synergistic and antagonistic responses of herbicide combinations", Weeds, 15, pp. 20-22, 1967).

10 The term "synergistic effect" is also understood to refer to that defined by application of the Tammes method, (Tammes, P. M. L., "Isoboles, a graphic representation of synergism in pesticides", Netherl. J. Plant Pathol. 70, 1964).

The components can be used individually or already partially or completely mixed with one another to prepare the composition according to the invention. It is also possible for them to be  
15 packaged and used as combination such as a kit of parts.

The active compounds, separately or jointly, are prepared as a stock solution comprising 25 mg of active compound which is made up to 10 ml using a mixture of acetone and/or DMSO and the emulsifier Uniperol® EL (wetting agent having an emulsifying and dispersing action based on ethoxylated alkylphenols) in a ratio by volume of solvent/emulsifier of 99:1. The  
20 mixture is then made up to 100 ml with water. This stock solution is diluted with the solvent/-emulsifier/water mixture described to give the concentration of active compound stated below.

The visually determined percentages of infected leaf areas are converted into efficacies in % of the untreated control.

The efficacy (E) is calculated as follows using Abbot's formula:

$$25 \quad E = (1 - \alpha/\beta) \cdot 100$$

$\alpha$  corresponds to the fungicidal infection of the treated plants in % and

$\beta$  corresponds to the fungicidal infection of the untreated (control) plants in %

30 An efficacy of 0 means that the infection level of the treated plants corresponds to that of the untreated control plants; an efficacy of 100 means that the treated plants were not infected.

The expected efficacies of active compound combinations were determined using Colby's formula (Colby, S.R. "Calculating synergistic and antagonistic responses of herbicide combinations", Weeds, 15, pp. 20-22, 1967) and compared with the observed efficacies.

Colby's formula: 
$$E = x + y - x \cdot y/100$$

35 E expected efficacy, expressed in % of the untreated control, when using the mixture of the active compounds A and B at the concentrations a and b

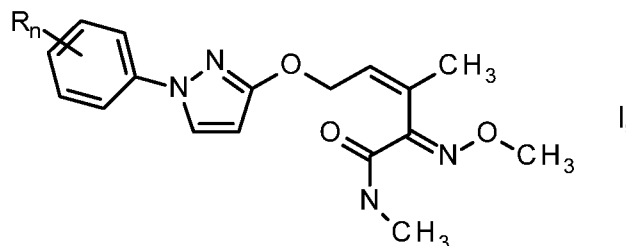
x efficacy, expressed in % of the untreated control, when using the active compound A at the concentration a

40 y efficacy, expressed in % of the untreated control, when using the active compound B at the concentration b.

## Claims

1. A mixture, comprising as active components

5 1) at least one compound of formula I



wherein

n is an integer and is 0, 1, 2, 3, 4 or 5; and

10 R, which may be the same or different to any other R, is halogen, hydroxyl, carboxyl, C<sub>1</sub>-C<sub>4</sub>-alkyl, C<sub>2</sub>-C<sub>4</sub>-alkenyl, C<sub>2</sub>-C<sub>8</sub>-alkynyl, C<sub>1</sub>-C<sub>4</sub>-haloalkyl, C<sub>1</sub>-C<sub>4</sub>-alkoxy, C<sub>1</sub>-C<sub>4</sub>-haloalkoxy, C<sub>1</sub>-C<sub>4</sub>-alkylsulfanyl, C<sub>1</sub>-C<sub>4</sub>-haloalkylsulfanyl, C<sub>1</sub>-C<sub>6</sub>-alkoxyimino-C<sub>1</sub>-C<sub>4</sub>-alkyl, C<sub>2</sub>-C<sub>6</sub>-alkenyloxyimino-C<sub>1</sub>-C<sub>4</sub>-alkyl, C<sub>2</sub>-C<sub>6</sub>-alkynyloxyimino-C<sub>1</sub>-C<sub>4</sub>-alkyl, C<sub>1</sub>-C<sub>4</sub>-alkoxyimino-C<sub>1</sub>-C<sub>4</sub>-alkyl, C<sub>1</sub>-C<sub>6</sub>-alkoxyimino-, C<sub>2</sub>-C<sub>6</sub>-alkenyloxyimino-, C<sub>2</sub>-C<sub>6</sub>-alkynyloxyimino-, C<sub>2</sub>-C<sub>6</sub>-haloalkenyloxyimino-, C<sub>3</sub>-C<sub>6</sub>-cycloalkyl, C<sub>3</sub>-C<sub>6</sub>-cycloalkenyl, phenyl or a 5-membered saturated, partially unsaturated or aromatic heterocyclyl which, in addition to carbon atoms, contains one to three heteroatoms from the group consisting of N, O and S as ring members; wherein the aforementioned cyclic groups R are attached via a direct bond, an oxygen or sulfur atom and where the aliphatic or cyclic groups R for their part may carry 1, 2, 3 or up to the maximum possible number of identical or different groups R<sup>a</sup>:

R<sup>a</sup>, which may be the same or different to any other R<sup>a</sup>, is halogen, C<sub>1</sub>-C<sub>4</sub>-alkyl or C<sub>1</sub>-C<sub>4</sub>-haloalkyl;

25

and

2) at least one pesticide II selected from:

30 3-(difluoromethyl)-N-methoxy-1-methyl-N-[1-methyl-2-(2,4,6-trichlorophenyl)ethyl]-pyrazole-4-carboxamide N-[(5-chloro-2-isopropyl-phenyl)methyl]-N-cyclopropyl-5-fluoro-1,3-dimethyl-pyrazole-4-carboxamide, N-[2-(3,4-difluorophenyl)phenyl]-3-(trifluoromethyl)pyrazine-2-carboxamide, 2-(1-methylheptyl)-4,6-dinitrophenyl-(2E)-2-butenate, (RS)-2-(1-methylheptyl)-4,6-dinitrophenylcrotonate, 4-cyclopropyl-N-(2,4-dimethoxyphenyl)thiadiazole-5-carboxamide, 3-[(3,4-dichloroisothiazol-5-yl)methoxy]-1,2-benzothiazole-1,1-dioxide, 9-fluoro-2,2-dimethyl-5-(3-quinolyl)-3H-1,4-benzoxazepine, 3-(difluoromethyl)-1,5-dimethyl-N-(1,1,3-trimethylindan-4-yl)pyrazole-4-carboxamide, (RS)-2-methoxy-N-methyl-2-[α-(2,5-xilyloxy)-o-tolyl]acet-

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- amide, (3-acetoxy-2-nitro-3-phenyl-propyl) acetate, harpin, 2-cyano-N-[1-(2,4-dichlorophenyl)ethyl]-3,3-dimethyl-butanamide, 4-(2-bromo-4-fluoro-phenyl)-N-(2-chloro-6-fluoro-phenyl)-2,5-dimethyl-pyrazol-3-amine, N-ethyl-2-[(3-ethynyl-8-methyl-6-quinolyl)oxy]butanamide, N-ethyl-2-[(3-ethynyl-8-methyl-6-quinolyl)oxy]-2-methylsulfanyl-acetamide, 2-[(3-ethynyl-8-methyl-6-quinolyl)oxy]-N-(2-fluoroethyl)-butanamide, 2-[(3-ethynyl-8-methyl-6-quinolyl)oxy]-N-(2-fluoroethyl)-2-methoxy-acetamide, 2-[(3-ethynyl-8-methyl-6-quinolyl)oxy]-N-propyl-butanamide, 2-[(3-ethynyl-8-methyl-6-quinolyl)oxy]-2-methoxy-N-propyl-acetamide, 2-[(3-ethynyl-8-methyl-6-quinolyl)oxy]-2-methylsulfanyl-N-propyl-acetamide, 2-[(3-ethynyl-8-methyl-6-quinolyl)oxy]-N-(2-fluoroethyl)-2-methylsulfanyl-acetamide, 3-chloro-6-methyl-5-phenyl-4-(2,4,6-trifluorophenyl)pyridazine, 3-chloro-4-(2,6-difluorophenyl)-6-methyl-5-phenyl-pyridazine, methyl (*E*)-2-[2-[(5-cyano-2-methyl-phenoxy)methyl]-phenyl]-3-methoxy-prop-2-enoate, methyl (*E*)-2-[2-[(2,5-dimethylphenoxy)methyl]phenyl]-3-methoxy-prop-2-enoate, methyl (*E*)-3-(fluoromethoxy)-2-[2-[(3,5,6-trichloro-2-ylidyl)oxymethyl]phenyl]prop-2-enoate, methyl (*E*)-2-[2-[[2-(2,4-dichloroanilino)-6-(trifluoromethyl)pyrimidin-4-yl]oxymethyl]phenyl]-3-methoxy-prop-2-enoate, N'-(2,5-dimethyl-4-phenoxy-phenyl)-N-ethyl-N-methyl-formamidine, N'-[4-[[3-[(4-chlorophenyl)methyl]-1,2,4-thiadiazol-5-yl]oxy]-2,5-dimethyl-phenyl]-N-ethyl-N-methyl-formamidine, N'-(5-bromo-6-indan-2-yloxy-2-methyl-3-pyridyl)-N-ethyl-N-methyl-formamidine, N'-[5-bromo-6-[1-(3,5-difluorophenyl)ethoxy]-2-methyl-3-pyridyl]-N-ethyl-N-methyl-formamidine, N'-[5-bromo-6-(4-isopropylcyclohexoxy)-2-methyl-3-pyridyl]-N-ethyl-N-methyl-formamidine, N'-[5-bromo-2-methyl-6-(1-phenylethoxy)-3-pyridyl]-N-ethyl-N-methyl-formamidine, 2-(6-benzyl-2-pyridyl)quinazoline, 2-[6-(3-fluoro-4-methoxy-phenyl)-5-methyl-2-pyridyl]quinazoline, [2-[[[(7R,8R,9S)-7-benzyl-9-methyl-8-(2-methylpropanoyloxy)-2,6-dioxo-1,5-dioxonan-3-yl]carbamoyl]-4-methoxy-3-pyridyl]oxymethyl 2-methylpropanoate, and [(6S,7R,8R)-8-benzyl-3-[(3-hydroxy-4-methoxy-pyridine-2-carbonyl)amino]-6-methyl-4,9-dioxo-1,5-dioxonan-7-yl] 2-methylpropanoate.
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2. The mixture according to claim 1, comprising component 1) and component 2) in a synergistically effective amount.
  3. The mixture according to claim 1 or 2, comprising component 1) and component 2) in a weight ratio of from 100:1 to 1:100.
  4. The mixture according to any of the claims 1 to 3, wherein n in formula I is 1, 2 or 3.
  5. The mixture according to any of the claims 1 to 4, wherein R in formula I is halogen, C<sub>1</sub>-C<sub>4</sub>-alkyl, C<sub>1</sub>-C<sub>4</sub>-haloalkyl, C<sub>1</sub>-C<sub>4</sub>-alkoxy, C<sub>1</sub>-C<sub>4</sub>-haloalkoxy, C<sub>1</sub>-C<sub>4</sub>-alkylsulfanyl, C<sub>1</sub>-C<sub>4</sub>-haloalkylsulfanyl or C<sub>3</sub>-C<sub>6</sub>-cycloalkyl.
  6. The mixture according to any of the claims 1 to 5, wherein the at least one compound of formula I is selected from (*Z*,2*E*)-5-[1-(4-chlorophenyl)pyrazol-3-yl]oxy-2-methoxyimino-

- N,3-dimethyl-pent-3-enamide, (*Z*,*2E*)-5-[1-(2,4-difluorophenyl)pyrazol-3-yl]oxy-2-methoxyimino-N,3-dimethyl-pent-3-enamide, (*Z*,*2E*)-5-[1-(2,4-dichlorophenyl)pyrazol-3-yl]oxy-2-methoxyimino-N,3-dimethyl-pent-3-enamide, (*Z*,*2E*)-5-[1-(2-chloro-4-methyl-phenyl)pyrazol-3-yl]oxy-2-methoxyimino-N,3-dimethyl-pent-3-enamide, (*Z*,*2E*)-2-methoxyimino-N,3-dimethyl-5-[1-(*p*-tolyl)pyrazol-3-yl]oxy-pent-3-enamide, (*Z*,*2E*)-5-[1-(2-methyl-4-fluorophenyl)pyrazol-3-yl]oxy-2-methoxyimino-N,3-dimethyl-pent-3-enamide, (*Z*,*2E*)-2-methoxyimino-N,3-dimethyl-5-[1-[4-(trifluoromethyl)phenyl]pyrazol-3-yl]oxy-pent-3-enamide, (*Z*,*2E*)-5-[1-(3,4-dichlorophenyl)pyrazol-3-yl]oxy-2-methoxyimino-N,3-dimethyl-pent-3-enamide, (*Z*,*2E*)-5-[1-(3,4-dimethylphenyl)pyrazol-3-yl]oxy-2-methoxyimino-N,3-dimethyl-pent-3-enamide, (*Z*,*2E*)-5-[1-(4-fluoro-3-methyl-phenyl)pyrazol-3-yl]oxy-2-methoxyimino-N,3-dimethyl-pent-3-enamide, (*Z*,*2E*)-5-[1-(3-chloro-4-fluoro-phenyl)pyrazol-3-yl]oxy-2-methoxyimino-N,3-dimethyl-pent-3-enamide, (*Z*,*2E*)-5-[1-(3-fluoro-4-chloro-phenyl)pyrazol-3-yl]oxy-2-methoxyimino-N,3-dimethyl-pent-3-enamide, (*Z*,*2E*)-5-[1-(4-chloro-2-fluoro-phenyl)pyrazol-3-yl]oxy-2-methoxyimino-N,3-dimethyl-pent-3-enamide, (*Z*,*2E*)-5-[1-[4-(difluoromethoxy)phenyl]pyrazol-3-yl]oxy-2-methoxyimino-N,3-dimethyl-pent-3-enamide, (*Z*,*2E*)-5-[1-(3-cyclopropylphenyl)pyrazol-3-yl]oxy-2-methoxyimino-N,3-dimethyl-pent-3-enamide, (*Z*,*2E*)-5-[1-[4-chloro-3-(trifluoromethyl)phenyl]pyrazol-3-yl]oxy-2-methoxyimino-N,3-dimethyl-pent-3-enamide, (*Z*,*2E*)-2-methoxyimino-N,3-dimethyl-5-[1-(3,4,5-trifluorophenyl)pyrazol-3-yl]oxy-pent-3-enamide and (*Z*,*2E*)-2-methoxyimino-N,3-dimethyl-5-[1-[4-(trifluoromethylsulfanyl)phenyl]pyrazol-3-yl]oxy-pent-3-enamide.
7. The mixture according to any of the claims 1 to 6, wherein the at least one pesticide II is selected from 3-(difluoromethyl)-N-methoxy-1-methyl-N-[1-methyl-2-(2,4,6-trichlorophenyl)ethyl]pyrazole-4-carboxamide, N-[(5-chloro-2-isopropyl-phenyl)methyl]-N-cyclopropyl-5-fluoro-1,3-dimethyl-pyrazole-4-carboxamide, N-[2-(3,4-difluorophenyl)phenyl]-3-(trifluoromethyl)pyrazine-2-carboxamide, 2-(1-methylheptyl)-4,6-dinitrophenyl-(*2E*)-2-butenolate, (*RS*)-2-(1-methylheptyl)-4,6-dinitrophenylcrotonate, 4-cyclopropyl-N-(2,4-dimethoxyphenyl)thiadiazole-5-carboxamide, 3-[(3,4-dichloroiso-thiazol-5-yl)methoxy]-1,2-benzothiazole-1,1-dioxide, 9-fluoro-2,2-dimethyl-5-(3-quinolyl)-3H-1,4-benzoxazepine, 3-(difluoromethyl)-1,5-dimethyl-N-(1,1,3-trimethylindan-4-yl)pyrazole-4-carboxamide, and (*RS*)-2-methoxy-N-methyl-2-[ $\alpha$ -(2,5-xylyloxy)-*o*-tolyl]acetamide.
8. The mixture according to claim 7, wherein the at least one pesticide II is selected from 3-(difluoromethyl)-N-methoxy-1-methyl-N-[1-methyl-2-(2,4,6-trichlorophenyl)ethyl]pyrazole-4-carboxamide, N-[(5-chloro-2-isopropyl-phenyl)methyl]-N-cyclopropyl-5-fluoro-1,3-dimethyl-pyrazole-4-carboxamide, and N-[2-(3,4-difluorophenyl)phenyl]-3-(trifluoromethyl)pyrazine-2-carboxamide.
9. The mixture according to claim 8, wherein the one compound of formula I is selected from (*Z*,*2E*)-5-[1-(4-chlorophenyl)pyrazol-3-yl]oxy-2-methoxyimino-N,3-dimethyl-pent-3-enamide, (*Z*,*2E*)-5-[1-(2,4-dichlorophenyl)pyrazol-3-yl]oxy-2-methoxyimino-N,3-dimethyl-pent-3-enamide, and (*Z*,*2E*)-5-[1-(4-chloro-2-fluoro-phenyl)pyrazol-3-yl]oxy-2-

methoxyimino-N,3-dimethyl-pent-3-enamide, and wherein the at least one pesticide II is selected from 3-(difluoromethyl)-N-methoxy-1-methyl-N-[1-methyl-2-(2,4,6-trichlorophenyl)ethyl]pyrazole-4-carboxamide, N-[(5-chloro-2-isopropyl-phenyl)methyl]-N-cyclopropyl-5-fluoro-1,3-dimethyl-pyrazole-4-carboxamide, and N-[2-(3,4-difluorophenyl)-phenyl]-3-(trifluoromethyl)pyrazine-2-carboxamide.

- 5
10. The mixture according to any of the claims 1 to 6, wherein the at least one pesticide II is selected from [2-[[[(3S,7R,8R,9S)-7-benzyl-9-methyl-8-(2-methylpropanoyloxy)-2,6-dioxo-1,5-dioxonan-3-yl]carbamoyl]-4-methoxy-3-pyridyl]oxymethyl 2-methylpropanoate and
- 10 [(3S,6S,7R,8R)-8-benzyl-3-[(3-hydroxy-4-methoxy-pyridine-2-carbonyl)amino]-6-methyl-4,9-dioxo-1,5-dioxonan-7-yl] 2-methylpropanoate.
11. The mixture according to claim 10, wherein the at least one pesticide II is
- 15 [2-[[[(3S,7R,8R,9S)-7-benzyl-9-methyl-8-(2-methylpropanoyloxy)-2,6-dioxo-1,5-dioxonan-3-yl]carbamoyl]-4-methoxy-3-pyridyl]oxymethyl 2-methylpropanoate.
12. The mixture according to any of the claims 1 to 11, comprising, as active components,
- 20 component 1) and component 2) as defined in any of the claims 1 to 11,
- and additionally
- 3) at least one pesticide III selected from the groups A) to O):
- A) Respiration inhibitors
- 25 - Inhibitors of complex III at Qo site: azoxystrobin, coumethoxystrobin, coumoxystrobin, dimoxystrobin, enestroburin, fenaminstrobin, fenoxystrobin/flufoxystrobin, fluoxastrobin, kresoxim-methyl, mandestrobin, metominostrobin, oryastrobin, picoxystrobin, pyraclostrobin, pyrametostrobin, pyraoxystrobin, trifloxystrobin, 2-(2-(3-(2,6-dichlorophenyl)-1-methyl-allylideneaminooxymethyl)-phenyl)-
- 30 2-methoxyimino-N-methyl-acetamide, pyribencarb, triclopyricarb/chlorodincarb, famoxadone, fenamidone, methyl-N-[2-[(1,4-dimethyl-5-phenyl-pyrazol-3-yl)oxymethyl]phenyl]-N-methoxy-carbamate, 1-[3-chloro-2-[[1-(4-chlorophenyl)-1H-pyrazol-3-yl]oxymethyl]phenyl]-4-methyl-tetrazol-5-one, 1-[3-bromo-2-[[1-(4-chlorophenyl)pyrazol-3-yl]oxymethyl]phenyl]-4-methyl-tetrazol-5-one, 1-[2-[[1-(4-chlorophenyl)pyrazol-3-yl]oxymethyl]-3-methyl-phenyl]-4-methyl-tetrazol-5-one,
- 35 1-[2-[[1-(4-chlorophenyl)pyrazol-3-yl]oxymethyl]-3-fluoro-phenyl]-4-methyl-tetrazol-5-one, 1-[2-[[1-(2,4-dichlorophenyl)pyrazol-3-yl]oxymethyl]-3-fluoro-phenyl]-4-methyl-tetrazol-5-one, 1-[2-[[4-(4-chlorophenyl)thiazol-2-yl]oxymethyl]-3-methyl-phenyl]-4-methyl-tetrazol-5-one, 1-[3-chloro-2-[[4-(p-tolyl)thiazol-2-yl]oxymethyl]phenyl]-4-methyl-tetrazol-5-one, 1-[3-cyclopropyl-2-[[2-methyl-4-(1-methylpyrazol-3-yl)phenoxy]methyl]phenyl]-4-methyl-tetrazol-5-one, 1-[3-(difluoromethoxy)-2-[[2-methyl-4-(1-methylpyrazol-3-yl)phenoxy]methyl]phenyl]-4-methyl-tetrazol-5-one, 1-methyl-4-[3-methyl-2-[[2-methyl-4-(1-methylpyrazol-3-yl)phenoxy]methyl]phenyl]tetrazol-
- 40

- 5-one, 1-methyl-4-[3-methyl-2-[[1-[3-(trifluoromethyl)phenyl]-ethylideneamino]-oxymethyl]phenyl]tetrazol-5-one, (Z,2E)-5-[1-(2,4-dichlorophenyl)pyrazol-3-yl]-oxy-2-methoxyimino-N,3-dimethyl-pent-3-enamide, (Z,2E)-5-[1-(4-chlorophenyl)pyrazol-3-yl]oxy-2-methoxyimino-N,3-dimethyl-pent-3-enamide, pyriminostrobin, bifujunzhi,
- 5 2-(ortho-((2,5-dimethylphenyl-oxymethylen)phenyl)-3-methoxy-acrylic acid methyl-ester;
- inhibitors of complex III at Q<sub>i</sub> site: cyazofamid, amisulbrom, [(6*S*,7*R*,8*R*)-8-benzyl-3-[(3-hydroxy-4-methoxy-pyridine-2-carbonyl)amino]-6-methyl-4,9-dioxo-1,5-dioxonan-7-yl] 2-methylpropanoate, fencicoxamid;
  - 10 - inhibitors of complex II: benodanil, benzovindiflupyr, bixafen, boscalid, carboxin, fenfuram, fluopyram, flutolanil, fluxapyroxad, furametpyr, isofetamid, isopyrazam, mepronil, oxycarboxin, penflufen, penthiopyrad, pydiflumetofen, pyraziflumid, sedaxane, tecloftalam, thifluzamide, 3-(difluoromethyl)-1-methyl-N-(1,1,3-trimethylindan-4-yl)pyrazole-4-carboxamide, 3-(trifluoromethyl)-1-methyl-N-(1,1,3-trimethylindan-4-yl)pyrazole-4-carboxamide, 1,3-dimethyl-N-(1,1,3-trimethylindan-4-yl)-pyrazole-4-carboxamide, 3-(trifluoromethyl)-1,5-dimethyl-N-(1,1,3-trimethylindan-4-yl)pyrazole-4-carboxamide, 1,3,5-trimethyl-N-(1,1,3-trimethylindan-4-yl)pyrazole-4-carboxamide, 3-(difluoromethyl)-1,5-dimethyl-N-(1,1,3-trimethylindan-4-yl)pyrazole-4-carboxamide, 3-(difluoromethyl)-N-(7-fluoro-1,1,3-trimethylindan-4-yl)-1-methyl-pyrazole-4-carboxamide, 3-(difluoromethyl)-N-(7-fluoro-1,1,3-trimethylindan-4-yl)-1-methyl-pyrazole-4-carboxamide, N-[(5-chloro-2-isopropyl-phenyl)methyl]-N-cyclopropyl-5-fluoro-1,3-dimethyl-pyrazole-4-carboxamide, methyl
  - 15 (E)-2-[2-[(5-cyano-2-methyl-phenoxy)methyl]phenyl]-3-methoxy-prop-2-enoate, N-[(5-chloro-2-isopropyl-phenyl)methyl]-N-cyclopropyl-3-(difluoromethyl)-5-fluoro-1-methyl-pyrazole-4-carboxamide, 2-(difluoromethyl)-N-(1,1,3-trimethylindan-4-yl)pyridine-3-carboxamide, 2-(difluoromethyl)-N-[(3*R*)-1,1,3-trimethylindan-4-yl]pyridine-3-carboxamide, 2-(difluoromethyl)-N-(3-ethyl-1,1-dimethylindan-4-yl)pyridine-3-carboxamide, 2-(difluoromethyl)-N-[(3*R*)-3-ethyl-1,1-dimethylindan-4-yl]pyridine-3-carboxamide, 2-(difluoromethyl)-N-(1,1-dimethyl-3-propylindan-4-yl)pyridine-3-carboxamide, 2-(difluoromethyl)-N-[(3*R*)-1,1-dimethyl-3-propylindan-4-yl]pyridine-3-carboxamide, 2-(difluoromethyl)-N-(3-isobutyl-1,1-dimethylindan-4-yl)pyridine-3-carboxamide, 2-(difluoromethyl)-N-[(3*R*)-3-isobutyl-1,1-dimethylindan-4-yl]pyridine-3-carboxamide;
  - 20 - other respiration inhibitors: diflumetorim; nitrophenyl derivates: binapacryl, dinobuton, dinocap, fluazinam, meptyldinocap, ferimzone; organometal compounds: fentin salts, e. g. fentin-acetate, fentin chloride or fentin hydroxide; ametoctradin; silthiofam;
- B) Sterol biosynthesis inhibitors (SBI fungicides)
- 40 - C14 demethylase inhibitors: triazoles: azaconazole, bitertanol, bromuconazole, cyproconazole, difenoconazole, diniconazole, diniconazole-M, epoxiconazole, fenbuconazole, fluquinconazole, flusilazole, flutriafol, hexaconazole, imibenconazole, ipconazole, metconazole, myclobutanil, oxpoconazole, paclobutrazole, penconazole, propiconazole, prothioconazole, simeconazole, tebuconazole,



- tetraconazole, triadimefon, triadimenol, triticonazole, uniconazole, ipfentrifluconazole, mefentrifluconazole, 2-(chloromethyl)-2-methyl-5-(p-tolylmethyl)-1-(1,2,4-triazol-1-ylmethyl)cyclopentanol; imidazoles: imazalil, pefurazoate, prochloraz, triflumizol; pyrimidines, pyridines and piperazines: fenarimol, pyrifenoxy, triforine, [3-(4-chloro-2-fluoro-phenyl)-5-(2,4-difluorophenyl)isoxazol-4-yl]-(3-pyridyl)-methanol;
- 5
- Delta14-reductase inhibitors: aldimorph, dodemorph, dodemorph-acetate, fenpropimorph, tridemorph, fenpropidin, piperalin, spiroxamine;
  - Inhibitors of 3-keto reductase: fenhexamid;
- 10
- Other Sterol biosynthesis inhibitors: chlorphenomizole;
- C) Nucleic acid synthesis inhibitors
- phenylamides or acyl amino acid fungicides: benalaxyl, benalaxyl-M, kiralaxyl, metalaxyl, metalaxyl-M, ofurace, oxadixyl;
  - other nucleic acid synthesis inhibitors: hymexazole, octhilinone, oxolinic acid,
- 15
- bupirimate, 5-fluorocytosine, 5-fluoro-2-(p-tolylmethoxy)pyrimidin-4-amine, 5-fluoro-2-(4-fluorophenylmethoxy)pyrimidin-4-amine, 5-fluoro-2-(4-chlorophenylmethoxy)pyrimidin-4-amine;
- D) Inhibitors of cell division and cytoskeleton
- tubulin inhibitors: benomyl, carbendazim, fuberidazole, thiabendazole, thiophanate-methyl, 3-chloro-4-(2,6-difluorophenyl)-6-methyl-5-phenyl-pyridazine, 3-chloro-6-methyl-5-phenyl-4-(2,4,6-trifluorophenyl)pyridazine, N-ethyl-2-[(3-ethynyl-8-methyl-6-quinolyl)oxy]butanamide, N-ethyl-2-[(3-ethynyl-8-methyl-6-quinolyl)oxy]-2-methylsulfanyl-acetamide, 2-[(3-ethynyl-8-methyl-6-quinolyl)oxy]-N-(2-fluoroethyl)butanamide, 2-[(3-ethynyl-8-methyl-6-quinolyl)oxy]-N-(2-fluoroethyl)-2-methoxy-acetamide, 2-[(3-ethynyl-8-methyl-6-quinolyl)oxy]-N-propyl-butanamide, 2-[(3-ethynyl-8-methyl-6-quinolyl)oxy]-2-methoxy-N-propyl-acetamide, 2-[(3-ethynyl-8-methyl-6-quinolyl)oxy]-2-methylsulfanyl-N-propyl-acetamide, 2-[(3-ethynyl-8-methyl-6-quinolyl)oxy]-N-(2-fluoroethyl)-2-methylsulfanyl-acetamide, 4-(2-bromo-4-fluoro-phenyl)-N-(2-chloro-6-fluoro-phenyl)-2,5-dimethyl-pyrazol-3-amine;
- 20
- other cell division inhibitors: diethofencarb, ethaboxam, pencycuron, fluopicolide, zoxamide, metrafenone, pyriofenone;
- 25
- E) Inhibitors of amino acid and protein synthesis
- methionine synthesis inhibitors: cyprodinil, mepanipyrim, pyrimethanil;
  - protein synthesis inhibitors: blastidicin-S, kasugamycin, kasugamycin hydrochloride-hydrate, mildiomycin, streptomycin, oxytetracyclin;
- 30
- 35
- F) Signal transduction inhibitors
- MAP / histidine kinase inhibitors: fluoroimid, iprodione, procymidone, vinclozolin, fludioxonil;
  - G protein inhibitors: quinoxifen;
- 40
- G) Lipid and membrane synthesis inhibitors
- Phospholipid biosynthesis inhibitors: edifenphos, iprobenfos, pyrazophos, isoprotiolane;
  - lipid peroxidation: dicloran, quintozone, tecnazene, tolclofos-methyl, biphenyl,

chloroneb, etridiazole;

- phospholipid biosynthesis and cell wall deposition: dimethomorph, flumorph, mandipropamid, pyrimorph, bentiavalicarb, iprovalicarb, valifenalate;
- compounds affecting cell membrane permeability and fatty acids: propamocarb;
- 5 - inhibitors of oxysterol binding protein: oxathiapiprolin, 2-{3-[2-(1-{{3,5-bis(difluoromethyl)-1H-pyrazol-1-yl}acetyl)piperidin-4-yl)-1,3-thiazol-4-yl]-4,5-dihydro-1,2-oxazol-5-yl}phenyl methanesulfonate, 2-{3-[2-(1-{{3,5-bis(difluoromethyl)-1H-pyrazol-1-yl}acetyl)piperidin-4-yl)-1,3-thiazol-4-yl]-4,5-dihydro-1,2-oxazol-5-yl}-3-chloro-phenyl methanesulfonate, 4-[1-[2-[3-(difluoromethyl)-5-methyl-pyrazol-1-yl]acetyl]-4-piperidyl]-N-tetralin-1-yl-pyridine-2-carboxamide, 4-[1-[2-[3,5-bis(difluoromethyl)-pyrazol-1-yl]acetyl]-4-piperidyl]-N-tetralin-1-yl-pyridine-2-carboxamide, 4-[1-[2-[3-(difluoromethyl)-5-(trifluoromethyl)pyrazol-1-yl]acetyl]-4-piperidyl]-N-tetralin-1-yl-pyridine-2-carboxamide, 4-[1-[2-[5-cyclopropyl-3-(difluoromethyl)pyrazol-1-yl]acetyl]-4-piperidyl]-N-tetralin-1-yl-pyridine-2-carboxamide, 4-[1-[2-[5-methyl-3-(trifluoromethyl)pyrazol-1-yl]acetyl]-4-piperidyl]-N-tetralin-1-yl-pyridine-2-carboxamide, 4-[1-[2-[5-(difluoromethyl)-3-(trifluoromethyl)pyrazol-1-yl]acetyl]-4-piperidyl]-N-tetralin-1-yl-pyridine-2-carboxamide, 4-[1-[2-[3,5-bis(trifluoromethyl)pyrazol-1-yl]acetyl]-4-piperidyl]-N-tetralin-1-yl-pyridine-2-carboxamide, 4-[1-[2-[5-cyclopropyl-3-(trifluoromethyl)pyrazol-1-yl]acetyl]-4-piperidyl]-N-tetralin-1-yl-pyridine-2-carboxamide;

#### H) Inhibitors with Multi Site Action

- inorganic active substances: Bordeaux mixture, copper, copper acetate, copper hydroxide, copper oxychloride, basic copper sulfate, sulfur;
- thio- and dithiocarbamates: ferbam, mancozeb, maneb, metam, metiram, propineb, thiram, zineb, ziram;
- organochlorine compounds: anilazine, chlorothalonil, captafol, captan, folpet, dichlofluanid, dichlorophen, hexachlorobenzene, pentachlorophenole and its salts, phthalide, tolylfluanid;
- guanidines and others: guanidine, dodine, dodine free base, guazatine, guazatine-acetate, iminoctadine, iminoctadine-triacetate, iminoctadine-tris(albesilate), dithianon, 2,6-dimethyl-1H,5H-[1,4]dithiino[2,3-c:5,6-c']dipyrrole-1,3,5,7(2H,6H)-tetraone;

#### I) Cell wall synthesis inhibitors

- inhibitors of glucan synthesis: validamycin, polyoxin B;
- melanin synthesis inhibitors: pyroquilon, tricyclazole, carpropamid, dicyclomet, fenoxanil;

#### J) Plant defence inducers

- acibenzolar-S-methyl, probenazole, isotianil, tiadinil, prohexadione-calcium; phosphonates: fosetyl, fosetyl-aluminum, phosphorous acid and its salts, calcium phosphonate, potassium phosphonate, potassium or sodium bicarbonate, 4-cyclopropyl-N-(2,4-dimethoxyphenyl)thiadiazole-5-carboxamide;

#### K) Unknown mode of action

- bronopol, chinomethionat, cyflufenamid, cymoxanil, dazomet, debacarb, diclocymet, diclomezine, difenzoquat, difenzoquat-methylsulfate, diphenylamin, fenitropan,

fenpyrazamine, flumetover, flusulfamide, flutianil, harpin, methasulfocarb, nitrapyrin, nitrothal-isopropyl, tolprocarb, oxin-copper, proquinazid, tebufloquin, tecloftalam, triazoxide, N'-(4-(4-chloro-3-trifluoromethyl-phenoxy)-2,5-dimethyl-phenyl)-N-ethyl-N-methyl formamide, N'-(4-(4-fluoro-3-trifluoromethyl-phenoxy)-2,5-dimethyl-phenyl)-N-ethyl-N-methyl formamide, N'-[4-[[3-[(4-chlorophenyl)methyl]-1,2,4-thiadiazol-5-yl]oxy]-2,5-dimethyl-phenyl]-N-ethyl-N-methyl-formamide, N'-(5-bromo-6-indan-2-yloxy-2-methyl-3-pyridyl)-N-ethyl-N-methyl-formamide, N'-[5-bromo-6-[1-(3,5-difluorophenyl)ethoxy]-2-methyl-3-pyridyl]-N-ethyl-N-methyl-formamide, N'-[5-bromo-6-(4-isopropylcyclohexoxy)-2-methyl-3-pyridyl]-N-ethyl-N-methyl-formamide, N'-[5-bromo-2-methyl-6-(1-phenylethoxy)-3-pyridyl]-N-ethyl-N-methyl-formamide, N'-(2-methyl-5-trifluoromethyl-4-(3-trimethylsilylpropoxy)-phenyl)-N-ethyl-N-methyl formamide, N'-(5-difluoromethyl-2-methyl-4-(3-trimethylsilylpropoxy)-phenyl)-N-ethyl-N-methyl formamide, 2-(4-chloro-phenyl)-N-[4-(3,4-dimethoxy-phenyl)-isoxazol-5-yl]-2-prop-2-ynyloxy-acetamide, 3-[5-(4-chloro-phenyl)-2,3-dimethyl-isoxazolidin-3-yl]-pyridine (pyrisoxazole), 3-[5-(4-methylphenyl)-2,3-dimethyl-isoxazolidin-3-yl]-pyridine, 5-chloro-1-(4,6-dimethoxy-pyrimidin-2-yl)-2-methyl-1H-benzimidazole, ethyl (Z)-3-amino-2-cyano-3-phenyl-prop-2-enoate, picarbutrazox, pentyl N-[6-[[Z)-[(1-methyltetrazol-5-yl)-phenyl-methylene]amino]oxymethyl]-2-pyridyl]carbamate, but-3-ynyl N-[6-[[Z)-[(1-methyltetrazol-5-yl)-phenyl-methylene]amino]oxymethyl]-2-pyridyl]carbamate, 2-[2-[(7,8-difluoro-2-methyl-3-quinolyl)oxy]-6-fluoro-phenyl]propan-2-ol, 2-[2-fluoro-6-[(8-fluoro-2-methyl-3-quinolyl)oxy]phen-yl]propan-2-ol, quinofumelin, 9-fluoro-2,2-dimethyl-5-(3-quinolyl)-3H-1,4-benzoxazepine, 2-(6-benzyl-2-pyridyl)quinazoline, 2-[6-(3-fluoro-4-methoxyphenyl)-5-methyl-2-pyridyl]quinazoline, dichlobentiazox, N'-(2,5-dimethyl-4-phenoxy-phenyl)-N-ethyl-N-methyl-formamide;

#### M) Growth regulators

abscisic acid, amidochlor, ancymidol, 6-benzylaminopurine, brassinolide, butralin, chlormequat, chlormequat chloride, choline chloride, cyclanilide, daminozide, dikugulac, dimethipin, 2,6-dimethylpuridine, ethephon, flumetralin, flurprimidol, fluthiacet, forchlorfenuron, gibberellic acid, inabenfide, indole-3-acetic acid, maleic hydrazide, mefluidide, mepiquat, mepiquat chloride, naphthaleneacetic acid, N-6-benzyladenine, paclobutrazol, prohexadione, prohexadione-calcium, prohydrojasmon, thidiazuron, triapenthenol, tributyl phosphorotrithioate, 2,3,5-tri-iodobenzoic acid, trinexapac-ethyl, uniconazole;

#### N) Herbicides from classes N.1 to N.15

N.1 Lipid biosynthesis inhibitors: alloxydim, alloxydim-sodium, butoxydim, clethodim, clodinafop, clodinafop-propargyl, cycloxydim, cyhalofop, cyhalofop-butyl, diclofop, diclofop-methyl, fenoxaprop, fenoxaprop-ethyl, fenoxaprop-P, fenoxaprop-P-ethyl, fluazifop, fluazifop-butyl, fluazifop-P, fluazifop-P-butyl, haloxyfop, haloxyfop-methyl, haloxyfop-P, haloxyfop-P-methyl, metamifop, pinoxaden, profoxydim, propaquizafop, quizalofop, quizalofop-ethyl, quizalofop-tefuryl, quizalofop-P, quizalofop-P-ethyl, quizalofop-P-tefuryl, sethoxydim, tepraloxydim, tralkoxydim, 4-(4'-chloro-4-cyclopropyl-2'-fluoro[1,1'-biphenyl]-3-yl)-5-hydroxy-2,2,6,6-tetramethyl-2H-pyran-

3(6H)-one (CAS 1312337-72-6); 4-(2',4'-dichloro-4-cyclopropyl[1,1'-biphenyl]-3-yl)-5-hydroxy-2,2,6,6-tetramethyl-2H-pyran-3(6H)-one (CAS 1312337-45-3); 4-(4'-chloro-4-ethyl-2'-fluoro[1,1'-biphenyl]-3-yl)-5-hydroxy-2,2,6,6-tetramethyl-2H-pyran-3(6H)-one (CAS 1033757-93-5); 4-(2',4'-dichloro-4-ethyl[1,1'-biphenyl]-3-yl)-2,2,6,6-tetramethyl-2H-pyran-3,5(4H,6H)-dione (CAS 1312340-84-3); 5-(acetyloxy)-4-(4'-chloro-4-cyclopropyl-2'-fluoro[1,1'-biphenyl]-3-yl)-3,6-dihydro-2,2,6,6-tetramethyl-2H-pyran-3-one (CAS 1312337-48-6); 5-(acetyloxy)-4-(2',4'-dichloro-4-cyclopropyl-[1,1'-biphenyl]-3-yl)-3,6-dihydro-2,2,6,6-tetramethyl-2H-pyran-3-one; 5-(acetyloxy)-4-(4'-chloro-4-ethyl-2'-fluoro[1,1'-biphenyl]-3-yl)-3,6-dihydro-2,2,6,6-tetramethyl-2H-pyran-3-one (CAS 1312340-82-1); 5-(acetyloxy)-4-(2',4'-dichloro-4-ethyl[1,1'-biphenyl]-3-yl)-3,6-dihydro-2,2,6,6-tetramethyl-2H-pyran-3-one (CAS 1033760-55-2); 4-(4'-chloro-4-cyclopropyl-2'-fluoro[1,1'-biphenyl]-3-yl)-5,6-dihydro-2,2,6,6-tetramethyl-5-oxo-2H-pyran-3-yl carbonic acid methyl ester (CAS 1312337-51-1); 4-(2',4'-dichloro-4-cyclopropyl-[1,1'-biphenyl]-3-yl)-5,6-dihydro-2,2,6,6-tetramethyl-5-oxo-2H-pyran-3-yl carbonic acid methyl ester; 4-(4'-chloro-4-ethyl-2'-fluoro[1,1'-biphenyl]-3-yl)-5,6-dihydro-2,2,6,6-tetramethyl-5-oxo-2H-pyran-3-yl carbonic acid methyl ester (CAS 1312340-83-2); 4-(2',4'-dichloro-4-ethyl-[1,1'-biphenyl]-3-yl)-5,6-dihydro-2,2,6,6-tetramethyl-5-oxo-2H-pyran-3-yl carbonic acid methyl ester (CAS 1033760-58-5); benfuresate, butylate, cycloate, dalapon, dimepiperate, EPTC, esprocarb, ethofumesate, flupropanate, molinate, orbencarb, pebulate, prosulfocarb, TCA, thiobencarb, tiocarbazil, triallate and vernolate;

N.2 ALS inhibitors: amidosulfuron, azimsulfuron, bensulfuron, bensulfuron-methyl, chlorimuron, chlorimuron-ethyl, chlorsulfuron, cinosulfuron, cyclosulfamuron, ethametsulfuron, ethametsulfuron-methyl, ethoxysulfuron, flazasulfuron, flucetosulfuron, flupyrsulfuron, flupyrsulfuron-methyl-sodium, foramsulfuron, halosulfuron, halosulfuron-methyl, imazosulfuron, iodosulfuron, iodosulfuron-methyl-sodium, iofensulfuron, iofensulfuron-sodium, mesosulfuron, metazosulfuron, metsulfuron, metsulfuron-methyl, nicosulfuron, orthosulfamuron, oxasulfuron, primisulfuron, primisulfuron-methyl, propyrisulfuron, prosulfuron, pyrazosulfuron, pyrazosulfuron-ethyl, rimsulfuron, sulfometuron, sulfometuron-methyl, sulfosulfuron, thifensulfuron, thifensulfuron-methyl, triasulfuron, tribenuron, tribenuron-methyl, trifloxysulfuron, triflusulfuron, triflusulfuron-methyl, tritosulfuron, imazamethabenz, imazamethabenz-methyl, imazamox, imazapic, imazapyr, imazaquin, imazethapyr; cloransulam, cloransulam-methyl, diclosulam, flumetsulam, florasulam, metosulam, penoxsulam, pyrimisulfan and pyroxsulam; bispyribac, bispyribac-sodium, pyribenzoxim, pyriftalid, pyriminobac, pyriminobac-methyl, pyriithiobac, pyriithiobac-sodium, 4-[[[2-[(4,6-dimethoxy-2-pyrimidinyl)oxy]phenyl]methyl]amino]-benzoic acid-1-methyl-ethyl ester (CAS 420138-41-6), 4-[[[2-[(4,6-dimethoxy-2-pyrimidinyl)oxy]phenyl]-methyl]amino]-benzoic acid propyl ester (CAS 420138-40-5), N-(4-bromophenyl)-2-[(4,6-dimethoxy-2-pyrimidinyl)oxy]benzenemethanamine (CAS 420138-01-8); flucarbazone, flucarbazone-sodium, propoxycarbazone, propoxycarbazone-

sodium, thien carbazon, thien carbazon-methyl; triafamone;

N.3 Photosynthesis inhibitors: amicarbazon; chlorotriazin; ametryn, atrazine, chloridazon, cyanazine, desmetryn, dimethametryn, hexazinone, metribuzin, prometon, prometryn, propazine, simazine, simetryn, terbumeton, terbuthylazin, terbutryn, trietazin; chlorobromuron, chlorotoluron, chloroxuron, dimefuron, diuron, fluometuron, isoproturon, isouron, linuron, metamitron, methabenzthiazuron, metobenzuron, metoxuron, monolinuron, neburon, siduron, tebuthiuron, thiadiazuron, desmedipham, karbutilat, phenmedipham, phenmedipham-ethyl, bromofenoxim, bromoxynil and its salts and esters, ioxynil and its salts and esters, bromacil, lenacil, terbacil, bentazon, bentazon-sodium, pyridate, pyridafol, pentanochlor, propanil; diquat, diquat-dibromide, paraquat, paraquat-dichloride, paraquat-dimetilsulfate;

N.4 protoporphyrinogen-IX oxidase inhibitors: acifluorfen, acifluorfen-sodium, azafenidin, bencarbazon, benzfendizon, bifenox, butafenacil, carfentrazone, carfentrazone-ethyl, chlormethoxyfen, cinidon-ethyl, fluazolate, flufenpyr, flufenpyr-ethyl, flumiclorac, flumiclorac-pentyl, flumioxazin, fluoroglycofen, fluoroglycofen-ethyl, fluthiacet, fluthiacet-methyl, fomesafen, halosafen, lactofen, oxadiargyl, oxadiazon, oxyfluorfen, pentoxazon, profluzol, pyraclonil, pyraflufen, pyraflufen-ethyl, saflufenacil, sulfentrazone, thidiazimin, tiafenacil, trifludimoxazin, ethyl [3-[2-chloro-4-fluoro-5-(1-methyl-6-trifluoromethyl-2,4-dioxo-1,2,3,4-tetrahydropyrimidin-3-yl)-phenoxy]-2-pyridyloxy]acetate (CAS 353292-31-6), N-ethyl-3-(2,6-dichloro-4-trifluoro-methylphenoxy)-5-methyl-1H-pyrazole-1-carboxamide (CAS 452098-92-9), N tetrahydrofurfuryl-3-(2,6-dichloro-4-trifluoromethylphenoxy)-5-methyl-1H-pyrazole-1-carboxamide (CAS 915396-43-9), N-ethyl-3-(2-chloro-6-fluoro-4-trifluoromethyl-phenoxy)-5-methyl-1H-pyrazole-1-carboxamide (CAS 452099-05-7), N-tetrahydro-furfuryl-3-(2-chloro-6-fluoro-4-trifluoro-methylphenoxy)-5-methyl-1H-pyrazole-1-carboxamide (CAS 452100-03-7), 3-[7-fluoro-3-oxo-4-(prop-2-ynyl)-3,4-dihydro-2H-benzo[1,4]oxazin-6-yl]-1,5-dimethyl-6-thioxo-[1,3,5]triazinan-2,4-dione (CAS 451484-50-7), 2-(2,2,7-trifluoro-3-oxo-4-prop-2-ynyl-3,4-dihydro-2H-benzo[1,4]oxazin-6-yl)-4,5,6,7-tetrahydro-isoindole-1,3-dione (CAS 1300118-96-0), 1-methyl-6-trifluoro-methyl-3-(2,2,7-tri-fluoro-3-oxo-4-prop-2-ynyl-3,4-dihydro-2H-benzo[1,4]oxazin-6-yl)-1H-pyrimidine-2,4-dione (CAS 1304113-05-0), methyl (E)-4-[2-chloro-5-[4-chloro-5-(difluoromethoxy)-1H-methyl-pyrazol-3-yl]-4-fluorophenoxy]-3-methoxy-but-2-enoate (CAS 948893-00-3), 3-[7-chloro-5-fluoro-2-(trifluoromethyl)-1H-benzimidazol-4-yl]-1-methyl-6-(trifluoromethyl)-1H-pyrimidine-2,4-dione (CAS 212754-02-4);

N.5 Bleacher herbicides: beflubutamid, diflufenican, fluridone, flurochloridone, flurtamone, norflurazon, picolinafen, 4-(3-trifluoromethyl-phenoxy)-2-(4-trifluoromethylphenyl)-pyrimidine (CAS 180608-33-7); benzobicyclon, benzofenap, bicyclepyrone, clomazone, fenquintrione, isoxaflutole, mesotrione, pyrasulfotole, pyrazolynate, pyrazoxyfen, sulcotrione, tefuryltrione, tembotrione, tolpyralate, topramezone; aclonifen, amitrole, flumeturon;

N.6 EPSP synthase inhibitors: glyphosate, glyphosate-isopropylammonium, glyposate-

potassium, glyphosate-trimesium (sulfosate);

N.7 Glutamine synthase inhibitors: bilanaphos (bialaphos), bilanaphos-sodium, glufosinate, glufosinate-P, glufosinate-ammonium;

N.8 DHP synthase inhibitors: asulam;

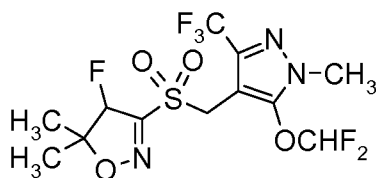
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N.9 Mitosis inhibitors: benfluralin, butralin, dinitramine, ethalfluralin, fluchloralin, oryzalin, pendimethalin, prodiamine, trifluralin; amiprofos, amiprofos-methyl, butamiphos; chlorthal, chlorthal-dimethyl, dithiopyr, thiazopyr, propyzamide, tebutam; carbetamide, chlorpropham, flamprop, flamprop-isopropyl, flamprop-methyl, flamprop-M-isopropyl, flamprop-M-methyl, propham;

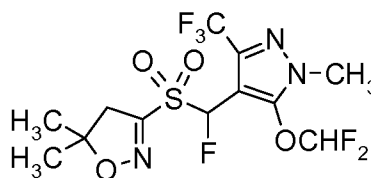
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N.10 VLCFA inhibitors: acetochlor, alachlor, butachlor, dimethachlor, dimethenamid, dimethenamid-P, metazachlor, metolachlor, metolachlor-S, pethoxamid, pretilachlor, propachlor, propisochlor, thenylchlor, flufenacet, mefenacet, diphenamid, naproanilide, napropamide, napropamide-M, fentrazamide, anilofos, cafenstrole, fenoxasulfone, ipfencarbazone, piperophos, pyroxasulfone, isoxazoline compounds of formulae II.1, II.2, II.3, II.4, II.5, II.6, II.7, II.8 and II.9:

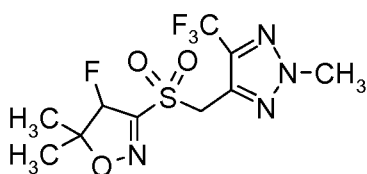
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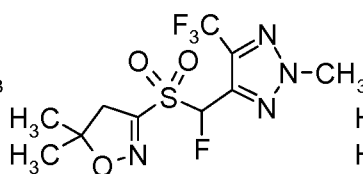
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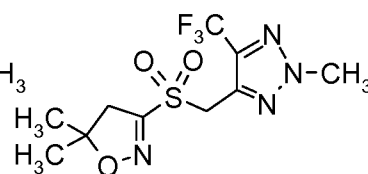
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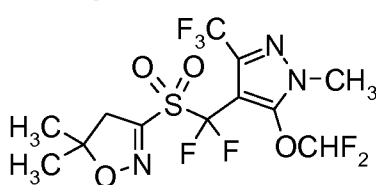
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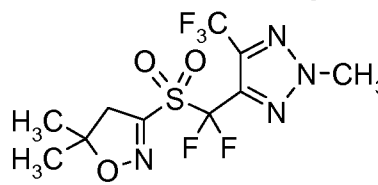
II.4



II.5

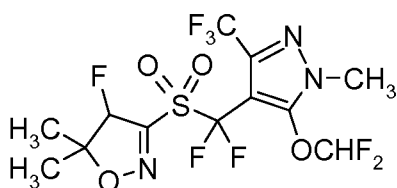


II.6

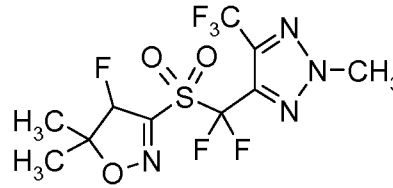


II.7

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II.8



II.9

N.11 Cellulose biosynthesis inhibitors: chlorthiamid, dichlobenil, flupoxam, indaziflam, isoxaben, triaziflam, 1-cyclohexyl-5-pentafluorophenoxy-14-[1,2,4,6]thiatriazin-3-ylamine (CAS 175899-01-1);

25

N.12 Decoupler herbicides: dinoseb, dinoterb, DNOC and its salts;

- 5 N.13 Auxinic herbicides: 2,4-D and its salts and esters, clacyfos, 2,4-DB and its salts and esters, aminocyclopyrachlor and its salts and esters, aminopyralid and its salts such as aminopyralid-dimethylammonium, aminopyralid-tris(2-hydroxypropyl)ammonium and its esters, benazolin, benazolin-ethyl, chloramben and its salts and esters, clomeprop, clopyralid and its salts and esters, dicamba and its salts and esters, dichlorprop and its salts and esters, dichlorprop-P and its salts and esters, fluroxypyr, fluroxypyr-butometyl, fluroxypyr-meptyl, halauxifen and its salts and esters (CAS 943832-60-8); MCPA and its salts and esters, MCPA-thioethyl, MCPB and its salts and esters, mecoprop and its salts and esters, mecoprop-P and its salts and esters, picloram and its salts and esters, quinclorac, quinmerac, TBA (2,3,6) and its salts and esters, triclopyr and its salts and esters, 4-amino-3-chloro-6-(4-chloro-2-fluoro-3-methoxyphenyl)-5-fluoropyridine-2-carboxylic acid, benzyl 4-amino-3-chloro-6-(4-chloro-2-fluoro-3-methoxyphenyl)-5-fluoropyridine-2-carboxylate (CAS 1390661-72-9);
- 10
- 15 N.14 Auxin transport inhibitors: diflufenzopyr, diflufenzopyr-sodium, naptalam and naptalam-sodium;
- N.15 Other herbicides: bromobutide, chlorflurenol, chlorflurenol-methyl, cinmethylin, cumyluron, cyclopyrimorate (CAS 499223-49-3) and its salts and esters, dalapon, dazomet, difenzoquat, difenzoquat-metilsulfate, dimethipin, DSMA, dymron, endo-  
20 thal and its salts, etobenzanid, flurenol, flurenol-butyl, flurprimidol, fosamine, fosamine-ammonium, indanofan, maleic hydrazide, mefluidide, metam, methiozolin (CAS 403640-27-7), methyl azide, methyl bromide, methyl-dymron, methyl iodide, MSMA, oleic acid, oxaziclomefone, pelargonic acid, pyributicarb, quinoclamine, tridiphane;
- 25 O) Insecticides from classes O.1 to O.29
- O.1 Acetylcholine esterase (AChE) inhibitors: aldicarb, alanycarb, bendiocarb, benfuracarb, butocarboxim, butoxycarboxim, carbaryl, carbofuran, carbosulfan, ethiofencarb, fenobucarb, formetanate, furathiocarb, isoprocarb, methiocarb, methomyl, metolcarb, oxamyl, pirimicarb, propoxur, thiodicarb, thiofanox,  
30 trimethacarb, XMC, xylylcarb and triazamate; acephate, azamethiphos, azinphos-ethyl, azinphosmethyl, cadusafos, chlorethoxyfos, chlorfenvinphos, chlormephos, chlorpyrifos, chlorpyrifos-methyl, coumaphos, cyanophos, demeton-S-methyl, diazinon, dichlorvos/ DDVP, dicrotophos, dimethoate, dimethylvinphos, disulfoton, EPN, ethion, ethoprophos, famphur, fenamiphos, fenitrothion, fenthion, fosthiazate,  
35 heptenophos, imicyafos, isofenphos, isopropyl O-(methoxyaminothio-phosphoryl) salicylate, isoxathion, malathion, mecarbam, methamidophos, methidathion, mevinphos, monocrotophos, naled, omethoate, oxydemeton-methyl, parathion, parathion-methyl, phenthoate, phorate, phosalone, phosmet, phosphamidon, phoxim, pirimiphos- methyl, profenofos, propetamphos, prothiofos, pyraclofos,  
40 pyridaphenthion, quinalphos, sulfotep, tebupirimfos, temephos, terbufos, tetrachlorvinphos, thiometon, triazophos, trichlorfon, vamidothion;
- O.2 GABA-gated chloride channel antagonists: endosulfan, chlordane; ethiprole, fipronil, flufiprole, pyrafluprole, pyriprole;

- 5 O.3 Sodium channel modulators: acrinathrin, allethrin, d-cis-trans allethrin, d-trans allethrin, bifenthrin, bioallethrin, bioallethrin S-cyclopentenyl, bioresmethrin, cycloprothrin, cyfluthrin, beta-cyfluthrin, cyhalothrin, lambda-cyhalothrin, gamma-cyhalothrin, cypermethrin, alpha-cypermethrin, beta-cypermethrin, theta-cypermethrin, zeta-cypermethrin, cyphenothrin, deltamethrin, empenothrin, esfenvalerate, etofenprox, fenpropathrin, fenvalerate, flucythrinate, flumethrin, tau-fluvalinate, halfenprox, heptafluthrin, imiprothrin, meperfluthrin, metofluthrin, momfluorothrin, permethrin, phenothrin, prallethrin, profluthrin, pyrethrin (pyrethrum), resmethrin, silafluofen, tefluthrin, tetramethylfluthrin, tetramethrin, 10 tralomethrin and transfluthrin; DDT, methoxychlor;
- O.4 Nicotinic acetylcholine receptor agonists (nAChR): acetamiprid, clothianidin, cycloxaprid, dinotefuran, imidacloprid, nitenpyram, thiacloprid, thiamethoxam; (2E)-1-[(6-chloropyridin-3-yl)methyl]-N'-nitro-2-pentylidene-hydrazinecarboximidamide; 1-[(6-chloropyridin-3-yl)methyl]-7-methyl-8-nitro-5-propoxy-1,2,3,5,6,7-hexahydroimidazo[1,2-a]pyridine; nicotine; 15
- O.5 Nicotinic acetylcholine receptor allosteric activators: spinosad, spinetoram;
- O.6 Chloride channel activators: abamectin, emamectin benzoate, ivermectin, lepi-mectin, milbemectin;
- O.7 Juvenile hormone mimics: hydroprene, kinoprene, methoprene; fenoxycarb, 20 pyriproxyfen;
- O.8 miscellaneous non-specific (multi-site) inhibitors: methyl bromide and other alkyl halides; chloropicrin, sulfuryl fluoride, borax, tartar emetic;
- O.9 Selective homopteran feeding blockers: pymetrozine, flonicamid;
- O.10 Mite growth inhibitors: clofentezine, hexythiazox, diflovidazin; etoxazole; 25
- O.11 Microbial disruptors of insect midgut membranes: *Bacillus thuringiensis*, *Bacillus sphaericus* and the insecticidal proteins they produce: *Bacillus thuringiensis* subsp. *israelensis*, *Bacillus sphaericus*, *Bacillus thuringiensis* subsp. *aizawai*, *Bacillus thuringiensis* subsp. *kurstaki*, *Bacillus thuringiensis* subsp. *tenebrionis*, the Bt crop proteins: Cry1Ab, Cry1Ac, Cry1Fa, Cry2Ab, mCry3A, Cry3Ab, Cry3Bb, 30 Cry34/35Ab1;
- O.12 Inhibitors of mitochondrial ATP synthase: diafenthiuron; azocyclotin, cyhexatin, fenbutatin oxide, propargite, tetradifon;
- O.13 Uncouplers of oxidative phosphorylation via disruption of the proton gradient: chlorfenapyr, DNOC, sulfluramid; 35
- O.14 Nicotinic acetylcholine receptor (nAChR) channel blockers: bensultap, cartap hydrochloride, thiocyclam, thiosultap sodium;
- O.15 Inhibitors of the chitin biosynthesis type 0: bistrifluron, chlorfluazuron, diflubenzuron, flucycloxuron, flufenoxuron, hexaflumuron, lufenuron, novaluron, noviflumuron, teflubenzuron, triflumuron; 40
- O.16 Inhibitors of the chitin biosynthesis type 1: buprofezin;
- O.17 Moulting disruptors: cyromazine;
- O.18 Ecdyson receptor agonists: methoxyfenozide, tebufenozide, halofenozide, fufenozide, chromafenozide;



- O.19 Octopamin receptor agonists: amitraz;
- O.20 Mitochondrial complex III electron transport inhibitors: hydramethylnon, acequinocyl, fluacrypyrim;
- 5 O.21 Mitochondrial complex I electron transport inhibitors: fenazaquin, fenpyroximate, pyrimidifen, pyridaben, tebufenpyrad, tolfenpyrad; rotenone;
- O.22 Voltage-dependent sodium channel blockers: indoxacarb, metaflumizone, 2-[2-(4-cyanophenyl)-1-[3-(trifluoromethyl)phenyl]ethylidene]-N-[4-(difluoromethoxy)phenyl]-hydrazinecarboxamide or M.22B.2: N-(3-chloro-2-methylphenyl)-2-[(4-chlorophenyl)-[4-[methyl(methylsulfonyl)amino]phenyl]methylene]-
- 10 hydrazinecarboxamide;
- O.23 Inhibitors of the of acetyl CoA carboxylase: spiroadiclofen, spiromesifen, spirotetramat;
- O.24 Mitochondrial complex IV electron transport inhibitors: aluminium phosphide, calcium phosphide, phosphine, zinc phosphide, cyanide;
- 15 O.25 Mitochondrial complex II electron transport inhibitors: cyenopyrafen, cyflumetofen;
- O.26 Ryanodine receptor-modulators: flubendiamide, chlorantraniliprole, cyantraniliprole, cyclaniliprole tetraniliprole; (R)-3-chloro-N1-{2-methyl-4-[1,2,2,2 -tetrafluoro-1-(trifluoromethyl)ethyl]phenyl}-N2-(1-methyl-2-methylsulfonyl)ethyl)phthalamide, (S)-3-chloro-N1-{2-methyl-4-[1,2,2,2 -tetrafluoro-1-(trifluoromethyl)ethyl]phenyl}-N2-(1-methyl-2-methylsulfonyl)ethyl)phthalamide, methyl-2-[3,5-dibromo-2-({[3-bromo-1-(3-chloropyridin-2-yl)-1H-pyrazol-5-yl]carbonyl}amino)benzoyl]-1,2-dimethylhydrazinecarboxylate; N-[4,6-dichloro-2-[(diethyl-lambda-4-sulfanylidene)carbonyl]-phenyl]-2-(3-chloro-2-pyridyl)-5-(trifluoromethyl)pyrazole-3-carboxamide; N-[4-chloro-2-[(diethyl-lambda-4-sulfanylidene)carbonyl]-6-methyl-phenyl]-2-(3-chloro-2-pyridyl)-5-(trifluoromethyl)pyrazole-3-carboxamide; N-[4-chloro-2-[(di-2-propyl-lambda-4-sulfanylidene)carbonyl]-6-methyl-phenyl]-2-(3-chloro-2-pyridyl)-5-(trifluoromethyl)pyrazole-3-carboxamide; N-[4,6-dichloro-2-[(di-2-propyl-lambda-4-sulfanylidene)carbonyl]-phenyl]-2-(3-chloro-2-pyridyl)-5-(trifluoromethyl)pyrazole-3-carboxamide; N-[4,6-dibromo-2-[(diethyl-lambda-4-sulfanylidene)carbonyl]-phenyl]-2-(3-chloro-2-pyridyl)-5-(trifluoromethyl)pyrazole-3-carboxamide; N-[2-(5-amino-1,3,4-thiadiazol-2-yl)-4-chloro-6-methylphenyl]-3-bromo-1-(3-chloro-2-pyridinyl)-1H-pyrazole-5-carboxamide; 3-chloro-1-(3-chloro-2-pyridinyl)-N-[2,4-dichloro-6-[(1-cyano-1-methylethyl)amino]carbonyl]phenyl]-1H-pyrazole-5-carboxamide; 3-bromo-N-[2,4-dichloro-6-(methylcarbonyl)phenyl]-1-(3,5-dichloro-2-pyridyl)-1H-pyrazole-5-carboxamide; N-[4-chloro-2-[(1,1-dimethylethyl)amino]carbonyl]-6-methylphenyl]-1-(3-chloro-2-pyridinyl)-3-(fluoromethoxy)-1H-pyrazole-5-carboxamide; cyhalodiamide;
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- 25
- 30
- 35
- 40 O.27. insecticidal active compounds of unknown or uncertain mode of action: afidopyropen, afoxolaner, azadirachtin, amidoflumet, benzoximate, bifenazate, broflani-  
lide, bromopropylate, chinomethionat, cryolite, dicloromezotiaz, dicofol, flufenerim, flometoquin, fluensulfone, fluhexafon, fluopyram, flupyradifurone, fluralaner, meto-  
xadiazone, piperonyl butoxide, pyflubumide, pyridalyl, pyrifluquinazon, sulfoxaflor,

tioxazafen, triflumezopyrim, 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)sulfinyl]phenyl]-3-(trifluoromethyl)-1H-1,2,4-triazole-5-amine, *Bacillus firmus*; (*E/Z*)-N-[1-[(6-chloro-3-pyridyl)methyl]-2-pyridylidene]-2,2,2-trifluoro-acetamide; (*E/Z*)-N-[1-[(6-chloro-5-fluoro-3-pyridyl)methyl]-2-pyridylidene]-2,2,2-trifluoro-acetamide; (*E/Z*)-2,2,2-trifluoro-N-[1-[(6-fluoro-3-pyridyl)methyl]-2-pyridylidene]acetamide; (*E/Z*)-N-[1-[(6-bromo-3-pyridyl)methyl]-2-pyridylidene]-2,2,2-trifluoro-acetamide; (*E/Z*)-N-[1-[1-(6-chloro-3-pyridyl)ethyl]-2-pyridylidene]-2,2,2-trifluoro-acetamide; (*E/Z*)-N-[1-[(6-chloro-3-pyridyl)methyl]-2-pyridylidene]-2,2-difluoro-acetamide; (*E/Z*)-2-chloro-N-[1-[(6-chloro-3-pyridyl)methyl]-2-pyridylidene]-2,2-difluoro-acetamide; (*E/Z*)-N-[1-[(2-chloropyrimidin-5-yl)methyl]-2-pyridylidene]-2,2,2-trifluoro-acetamide; (*E/Z*)-N-[1-[(6-chloro-3-pyridyl)methyl]-2-pyridylidene]-2,2,3,3,3-pentafluoro-propanamide.); N-[1-[(6-chloro-3-pyridyl)methyl]-2-pyridylidene]-2,2,2-trifluoro-thioacetamide; N-[1-[(6-chloro-3-pyridyl)methyl]-2-pyridylidene]-2,2,2-trifluoro-N'-isopropyl-acetamidine; fluazaindolizine; 4-[5-(3,5-dichlorophenyl)-5-(trifluoromethyl)-4H-isoxazol-3-yl]-2-methyl-N-(1-oxothietan-3-yl)benzamide; fluxametamide; 5-[3-[2,6-dichloro-4-(3,3-dichloroallyloxy)phenoxy]propoxy]-1H-pyrazole; 3-(benzoylmethylamino)-N-[2-bromo-4-[1,2,2,3,3,3-hexafluoro-1-(trifluoromethyl)propyl]-6-(trifluoromethyl)phenyl]-2-fluoro-benzamide; 3-(benzoylmethylamino)-2-fluoro-N-[2-iodo-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]-6-(trifluoromethyl)phenyl]-benzamide; N-[3-[[[2-iodo-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]-6-(trifluoromethyl)phenyl]amino]carbonyl]phenyl]-N-methyl-benzamide; N-[3-[[[2-bromo-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]-6-(trifluoromethyl)phenyl]amino]carbonyl]phenyl]-N-methyl-benzamide; 4-fluoro-N-[2-fluoro-3-[[[2-iodo-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]-6-(trifluoromethyl)phenyl]amino]carbonyl]phenyl]-N-methyl-benzamide; 3-fluoro-N-[2-fluoro-3-[[[2-iodo-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]-6-(trifluoromethyl)phenyl]amino]carbonyl]phenyl]-N-methyl-benzamide; 2-chloro-N-[3-[[[2-iodo-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]-6-(trifluoromethyl)phenyl]amino]carbonyl]phenyl]-3-pyridinecarboxamide; 4-cyano-N-[2-cyano-5-[[[2,6-dibromo-4-[1,2,2,3,3,3-hexafluoro-1-(trifluoromethyl)propyl]phenyl]carbonyl]phenyl]-2-methyl-benzamide; 4-cyano-3-[(4-cyano-2-methyl-benzoyl)amino]-N-[2,6-dichloro-4-[1,2,2,3,3,3-hexafluoro-1-(trifluoromethyl)propyl]phenyl]-2-fluoro-benzamide; N-[5-[[[2-chloro-6-cyano-4-[1,2,2,3,3,3-hexafluoro-1-(trifluoromethyl)propyl]phenyl]carbonyl]-2-cyano-phenyl]-4-cyano-2-methyl-benzamide; N-[5-[[[2-bromo-6-chloro-4-[2,2,2-trifluoro-1-hydroxy-1-(trifluoromethyl)ethyl]phenyl]carbonyl]-2-cyano-phenyl]-4-cyano-2-methyl-benzamide; N-[5-[[[2-bromo-6-chloro-4-[1,2,2,3,3,3-hexafluoro-1-(trifluoromethyl)propyl]phenyl]carbonyl]-2-cyano-phenyl]-4-cyano-2-methyl-benzamide; 4-cyano-N-[2-cyano-5-[[[2,6-

dichloro-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]phenyl]carbamoyl]phenyl]-2-methyl-benzamide; N-[5-[[2-bromo-6-chloro-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]phenyl]carbamoyl]-2-cyano-phenyl]-4-cyano-2-methyl-benzamide; 2-(1,3-dioxan-2-yl)-6-[2-(3-pyridinyl)-5-thiazolyl]-pyridine; 2-[6-[2-(5-fluoro-3-pyridinyl)-5-thiazolyl]-2-pyridinyl]-pyrimidine; 2-[6-[2-(3-pyridinyl)-5-thiazolyl]-2-pyridinyl]-pyrimidine; N-methylsulfonyl-6-[2-(3-pyridyl)thiazol-5-yl]pyridine-2-carboxamide; N-methylsulfonyl-6-[2-(3-pyridyl)thiazol-5-yl]pyridine-2-carboxamide; N-ethyl-N-[4-methyl-2-(3-pyridyl)thiazol-5-yl]-3-methylthio-propanamide; N-methyl-N-[4-methyl-2-(3-pyridyl)thiazol-5-yl]-3-methylthio-propanamide; N,2-dimethyl-N-[4-methyl-2-(3-pyridyl)thiazol-5-yl]-3-methylthio-propanamide; N-ethyl-2-methyl-N-[4-methyl-2-(3-pyridyl)thiazol-5-yl]-3-methylthio-propanamide; N-[4-chloro-2-(3-pyridyl)thiazol-5-yl]-N-ethyl-2-methyl-3-methylthio-propanamide; N-[4-chloro-2-(3-pyridyl)thiazol-5-yl]-N,2-dimethyl-3-methylthio-propanamide; N-[4-chloro-2-(3-pyridyl)thiazol-5-yl]-N-methyl-3-methylthio-propanamide; N-[4-chloro-2-(3-pyridyl)thiazol-5-yl]-N-ethyl-3-methylthio-propanamide; 1-[(6-chloro-3-pyridinyl)methyl]-1,2,3,5,6,7-hexahydro-5-methoxy-7-methyl-8-nitro-imidazo[1,2-a]pyridine; 1-[(6-chloropyridin-3-yl)methyl]-7-methyl-8-nitro-1,2,3,5,6,7-hexahydroimidazo[1,2-a]pyridin-5-ol; 1-isopropyl-N,5-dimethyl-N-pyridazin-4-yl-pyrazole-4-carboxamide; 1-(1,2-dimethylpropyl)-N-ethyl-5-methyl-N-pyridazin-4-yl-pyrazole-4-carboxamide; N,5-dimethyl-N-pyridazin-4-yl-1-(2,2,2-trifluoro-1-methyl-ethyl)pyrazole-4-carboxamide; 1-[1-(1-cyanocyclopropyl)ethyl]-N-ethyl-5-methyl-N-pyridazin-4-yl-pyrazole-4-carboxamide; N-ethyl-1-(2-fluoro-1-methyl-propyl)-5-methyl-N-pyridazin-4-yl-pyrazole-4-carboxamide; 1-(1,2-dimethylpropyl)-N,5-dimethyl-N-pyridazin-4-yl-pyrazole-4-carboxamide; 1-[1-(1-cyanocyclopropyl)ethyl]-N,5-dimethyl-N-pyridazin-4-yl-pyrazole-4-carboxamide; N-methyl-1-(2-fluoro-1-methyl-propyl)-5-methyl-N-pyridazin-4-yl-pyrazole-4-carboxamide; 1-(4,4-difluorocyclohexyl)-N-ethyl-5-methyl-N-pyridazin-4-yl-pyrazole-4-carboxamide; 1-(4,4-difluorocyclohexyl)-N,5-dimethyl-N-pyridazin-4-yl-pyrazole-4-carboxamide, N-(1-methylethyl)-2-(3-pyridinyl)-2H-indazole-4-carboxamide; N-cyclopropyl-2-(3-pyridinyl)-2H-indazole-4-carboxamide; N-cyclohexyl-2-(3-pyridinyl)-2H-indazole-4-carboxamide; 2-(3-pyridinyl)-N-(2,2,2-trifluoroethyl)-2H-indazole-4-carboxamide; 2-(3-pyridinyl)-N-[(tetrahydro-2-furanyl)methyl]-2H-indazole-5-carboxamide; methyl 2-[[2-(3-pyridinyl)-2H-indazol-5-yl]carbonyl]hydrazinecarboxylate; N-[(2,2-difluorocyclopropyl)methyl]-2-(3-pyridinyl)-2H-indazole-5-carboxamide; N-(2,2-difluoropropyl)-2-(3-pyridinyl)-2H-indazole-5-carboxamide; 2-(3-pyridinyl)-N-(2-pyrimidinylmethyl)-2H-indazole-5-carboxamide; N-[(5-methyl-2-pyrazinyl)methyl]-2-(3-pyridinyl)-2H-indazole-5-carboxamide, N-[3-chloro-1-(3-pyridyl)pyrazol-4-yl]-N-ethyl-3-(3,3,3-trifluoropropylsulfanyl)propanamide; N-[3-chloro-1-(3-pyridyl)pyrazol-4-yl]-N-ethyl-3-(3,3,3-trifluoropropylsulfanyl)propanamide; N-[3-chloro-1-(3-pyridyl)pyrazol-4-yl]-3-[(2,2-difluorocyclopropyl)methylsulfanyl]-N-ethyl-propanamide; N-[3-chloro-1-(3-pyridyl)pyrazol-4-yl]-3-[(2,2-difluorocyclopropyl)methylsulfanyl]-N-ethyl-propanamide; sarolaner, and lotilaner.

13. An agrochemical composition, comprising a solvent or solid carrier and a mixture according to any of claims 1 to 12.
- 5 14. The composition according to claim 13 further comprising seed in an amount of from 1 g to 1000 g active components per 100 kg of seed.
15. Use of the mixture as defined in any of the claims 1 to 12 or of the composition as defined in claim 13 for controlling phytopathogenic harmful fungi.
- 10 16. A method for controlling phytopathogenic harmful fungi, comprising treating the fungi, their habitat or the seed, the soil or the plants to be protected against fungal attack with an effective amount of the component 1) and the component 2) as defined in any one of claims 1 to 12 or of the composition as defined in claim 13.
- 15 17. Plant propagation material, coated with the mixture as defined in any of the claims 1 to 12 or with the composition as defined in claim 13.

**INTERNATIONAL SEARCH REPORT**

International application No  
PCT/EP2017/054554

**A. CLASSIFICATION OF SUBJECT MATTER**  
 INV. A01P3/00 A01N43/56  
 ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
 A01N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
 EPO-Internal, WPI Data, CHEM ABS Data

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2014/202421 A1 (BASF SE [DE]) 24 December 2014 (2014-12-24) page 3, line 18 page 22, line 17 page 54, lines 12-13 page 54, line 33 claims 1-16	1-15
A	----- EP 2 815 649 A1 (BASF SE [DE]) 24 December 2014 (2014-12-24) claims 1-14	1-17
A	----- WO 2013/092224 A1 (BASF SE [DE]; RHEINHEIMER JOACHIM [DE]; TERTERYAN VIOLETA [DE]; REDLIC) 27 June 2013 (2013-06-27) cited in the application examples; pages 86-94 -----	1-17

Further documents are listed in the continuation of Box C.

See patent family annex.

\* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E" earlier application or patent but published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search  20 March 2017	Date of mailing of the international search report  28/03/2017
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Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer  Davies, Maxwell
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Information on patent family members

International application No

PCT/EP2017/054554

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