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- (71) **Applicant:** BASF SE [DE/DE]; Carl-Bosch-Straße 38, 67056 Ludwigshafen (DE).
- (72) **Inventors:** CRAIG, Ian Robert; Carl-Bosch-Strasse 70, 67063 Ludwigshafen (DE). GRAMMENOS, Wassilios; Alexander-Fleming-Str. 13, 67071 Ludwigshafen (DE). RHEINHEIMER, Joachim; Merziger Str. 24, 67063 Ludwigshafen (DE). ESCRIBANO CUESTA, Ana; L8, 5, 68161 Mannheim (DE). BRAHM, Lutz; Am Hang 16, 67551 Worms (DE). HADEN, Egon; Maulbronner Hof 21, 67346 Speyer (DE).
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(54) **Title:** FUNGICIDAL MIXTURES COMPRISING STROBILURIN-TYPE FUNGICIDES

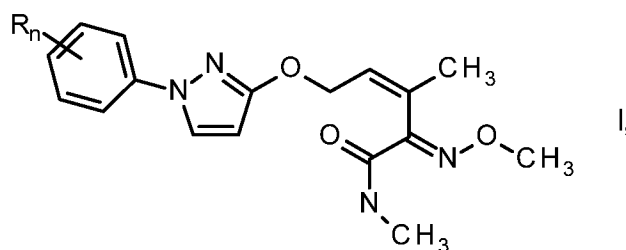
(57) **Abstract:** The present invention relates to fungicidal mixtures, comprising at least one fungicidally active strobilurin-type compound I and at least one pesticide II as defined in the description, and to compositions comprising these mixtures.

FUNGICIDAL MIXTURES 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, C₁-C₄-alkyl, C₂-C₄-alkenyl, C₂-C₈-alkynyl, C₁-C₄-haloalkyl, C₁-C₄-alkoxy, C₁-C₄-haloalkoxy, C₁-C₄-alkylsulfanyl, C₁-C₄-haloalkylsulfanyl, C₁-C₆-alkoxyimino-C₁-C₄-alkyl, C₂-C₆-alkenyloxyimino-C₁-C₄-alkyl, C₂-C₆-alkynyloxyimino-C₁-C₄-alkyl, C₁-C₄-alkoxyimino-C₁-C₄-alkyl, C₁-C₆-alkoxyimino-, C₂-C₆-alkenyloxyimino-, C₂-C₆-alkynyloxyimino-, C₂-C₆-haloalkenyloxyimino-, C₃-C₆-cycloalkyl, C₃-C₆-cycloalkenyl, phenyl or a 5-membered saturated, partially unsaturated or aromatic heterocycl

15 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^c for their part may carry 1, 2, 3 or up to the maximum possible number of identical or different groups R^a:

20 R^a, which may be the same or different to any other R^a, is halogen, C₁-C₄-alkyl or C₁-C₄-haloalkyl;

25 and

2) at least one pesticide II selected from:

1-[3-chloro-2-[[1-(4-chlorophenyl)-1H-pyrazol-3-yl]oxymethyl]phenyl]-4-methyl-tetrazol-5-one (II-1), 1-[3-bromo-2-[[1-(4-chlorophenyl)pyrazol-3-yl]oxymethyl]phenyl]-4-methyl-tetrazol-5-one (II-2), 1-[2-[[1-(4-chlorophenyl)pyrazol-3-yl]oxymethyl]-3-methyl-phenyl]-4-methyl-tetrazol-5-one (II-3), 1-[2-[[1-(4-chlorophenyl)pyrazol-3-yl]oxymethyl]-3-fluoro-phenyl]-4-methyl-tetrazol-5-one (II-4), 1-[2-[[1-(2,4-dichlorophenyl)pyrazol-3-yl]oxymethyl]-3-fluoro-phenyl]-4-methyl-tetrazol-5-one (II-5), 1-[2-[[4-(4-chlorophenyl)thiazol-2-yl]oxy-methyl]-3-methyl-phenyl]-4-methyl-tetrazol-5-one (II-6), 1-[3-chloro-2-[[4-(p-tolyl)thiazol-2-yl]oxymethyl]phenyl]-4-methyl-tetrazol-5-one (II-7), 1-[3-cyclopropyl-2-[[2-methyl-4-(1-methylpyrazol-3-yl)phenoxy]methyl]phenyl]-4-methyl-tetrazol-5-one (II-8), 1-[3-(di-fluoromethoxy)-2-[[2-methyl-4-(1-methylpyrazol-3-yl)phenoxy]methyl]phenyl]-4-methyl-tetrazol-5-one (II-9), 1-methyl-4-[3-methyl-2-[[2-methyl-4-(1-methylpyrazol-3-yl)phenoxy]-

30

35

methyl]phenyl]tetrazol-5-one (II-10) and 1-methyl-4-[3-methyl-2-[[1-[3-(trifluoromethyl)-phenyl]-ethylideneamino]oxymethyl]phenyl]tetrazol-5-one (II-11).

5 Compounds of formula I and their preparation and their use as fungicidally active compounds have been described in WO 2013/092224.

According to one embodiment of the invention, n is 1, 2 or 3 in formula I.

According to another embodiment, R is halogen, C₁-C₄-alkyl, C₁-C₄-haloalkyl, C₁-C₄-alkoxy, C₁-C₄-haloalkoxy, C₁-C₄-alkylsulfanyl, C₁-C₄-haloalkylsulfanyl or C₃-C₆-cycloalkyl in formula I.

10 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-methyl-phenyl)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).

According to another 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,2E)-5-[1-(4-chloro-2-fluoro-phenyl)pyrazol-3-yl]oxy-2-methoxyimino-N,3-dimethyl-pent-3-enamide (I-13).

More preferably, component 1) in the inventive mixtures is 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,2E)-5-[1-(4-chloro-2-fluoro-phenyl)pyrazol-3-yl]oxy-2-methoxyimino-N,3-dimethyl-pent-3-enamide (I-13).

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

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

5 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.

10 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.

15 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 (synergistic mixtures) and a broadened activity spectrum, in particular for certain indications.

20 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.

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
25 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
30 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 C₁-C₄-alkyl substituents and/or one phenyl or benzyl substituent, preferably diisopropylammonium, tetramethylammonium, tetrabutylammonium, trimethylbenzylammonium, furthermore phosphonium ions, sulfonium ions, preferably tri(C₁-C₄-alkyl)sulfonium, and sulfoxonium ions,
35 preferably tri(C₁-C₄-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 C₁-C₄-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
40 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.

The pesticides II described by IUPAC nomenclature, their preparation and their fungicidal activity are also known (WO 13/084223; WO 13/162072; WO 13/162077; WO 14/051161, WO 14/051165, WO 14/098201).

- 5 Particularly preferred are the following binary mixtures listed in Table A wherein compounds I are selected from compounds I-1 to I-18 and pesticides II are selected from pesticides II-1 to II-11 as defined above and listed:

Table A: Binary Mixtures A-1 to A-198 comprising as active ingredients one compound I as defined and numbered above as component 1) (Co. 1) and one pesticide II as defined and numbered above as component 2) (Co. 2).

10

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-2	II-1
A-13	I-2	II-2
A-14	I-2	II-3
A-15	I-2	II-4
A-16	I-2	II-5
A-17	I-2	II-6
A-18	I-2	II-7
A-19	I-2	II-8
A-20	I-2	II-9
A-21	I-2	II-10
A-22	I-2	II-11
A-23	I-3	II-1
A-24	I-3	II-2
A-25	I-3	II-3
A-26	I-3	II-4
A-27	I-3	II-5
A-28	I-3	II-6
A-29	I-3	II-7
A-30	I-3	II-8
A-31	I-3	II-9

Mixt.	Co. 1	Co. 2
A-32	I-3	II-10
A-33	I-3	II-11
A-34	I-4	II-1
A-35	I-4	II-2
A-36	I-4	II-3
A-37	I-4	II-4
A-38	I-4	II-5
A-39	I-4	II-6
A-40	I-4	II-7
A-41	I-4	II-8
A-42	I-4	II-9
A-43	I-4	II-10
A-44	I-4	II-11
A-45	I-5	II-1
A-46	I-5	II-2
A-47	I-5	II-3
A-48	I-5	II-4
A-49	I-5	II-5
A-50	I-5	II-6
A-51	I-5	II-7
A-52	I-5	II-8
A-53	I-5	II-9
A-54	I-5	II-10
A-55	I-5	II-11
A-56	I-6	II-1
A-57	I-6	II-2
A-58	I-6	II-3
A-59	I-6	II-4
A-60	I-6	II-5
A-61	I-6	II-6
A-62	I-6	II-7

Mixt.	Co. 1	Co. 2
A-63	I-6	II-8
A-64	I-6	II-9
A-65	I-6	II-10
A-66	I-6	II-11
A-67	I-7	II-1
A-68	I-7	II-2
A-69	I-7	II-3
A-70	I-7	II-4
A-71	I-7	II-5
A-72	I-7	II-6
A-73	I-7	II-7
A-74	I-7	II-8
A-75	I-7	II-9
A-76	I-7	II-10
A-77	I-7	II-11
A-78	I-8	II-1
A-79	I-8	II-2
A-80	I-8	II-3
A-81	I-8	II-4
A-82	I-8	II-5
A-83	I-8	II-6
A-84	I-8	II-7
A-85	I-8	II-8
A-86	I-8	II-9
A-87	I-8	II-10
A-88	I-8	II-11
A-89	I-9	II-1
A-90	I-9	II-2
A-91	I-9	II-3
A-92	I-9	II-4
A-93	I-9	II-5

Mixt.	Co. 1	Co. 2
A-94	I-9	II-6
A-95	I-9	II-7
A-96	I-9	II-8
A-97	I-9	II-9
A-98	I-9	II-10
A-99	I-9	II-11
A-100	I-10	II-1
A-101	I-10	II-2
A-102	I-10	II-3
A-103	I-10	II-4
A-104	I-10	II-5
A-105	I-10	II-6
A-106	I-10	II-7
A-107	I-10	II-8
A-108	I-10	II-9
A-109	I-10	II-10
A-110	I-10	II-11
A-111	I-11	II-1
A-112	I-11	II-2
A-113	I-11	II-3
A-114	I-11	II-4
A-115	I-11	II-5
A-116	I-11	II-6
A-117	I-11	II-7
A-118	I-11	II-8
A-119	I-11	II-9
A-120	I-11	II-10
A-121	I-11	II-11
A-122	I-12	II-1
A-123	I-12	II-2
A-124	I-12	II-3
A-125	I-12	II-4
A-126	I-12	II-5
A-127	I-12	II-6
A-128	I-12	II-7
A-129	I-12	II-8

Mixt.	Co. 1	Co. 2
A-130	I-12	II-9
A-131	I-12	II-10
A-132	I-12	II-11
A-133	I-13	II-1
A-134	I-13	II-2
A-135	I-13	II-3
A-136	I-13	II-4
A-137	I-13	II-5
A-138	I-13	II-6
A-139	I-13	II-7
A-140	I-13	II-8
A-141	I-13	II-9
A-142	I-13	II-10
A-143	I-13	II-11
A-144	I-14	II-1
A-145	I-14	II-2
A-146	I-14	II-3
A-147	I-14	II-4
A-148	I-14	II-5
A-149	I-14	II-6
A-150	I-14	II-7
A-151	I-14	II-8
A-152	I-14	II-9
A-153	I-14	II-10
A-154	I-14	II-11
A-155	I-15	II-1
A-156	I-15	II-2
A-157	I-15	II-3
A-158	I-15	II-4
A-159	I-15	II-5
A-160	I-15	II-6
A-161	I-15	II-7
A-162	I-15	II-8
A-163	I-15	II-9
A-164	I-15	II-10
A-165	I-15	II-11

Mixt.	Co. 1	Co. 2
A-166	I-16	II-1
A-167	I-16	II-2
A-168	I-16	II-3
A-169	I-16	II-4
A-170	I-16	II-5
A-171	I-16	II-6
A-172	I-16	II-7
A-173	I-16	II-8
A-174	I-16	II-9
A-175	I-16	II-10
A-176	I-16	II-11
A-177	I-17	II-1
A-178	I-17	II-2
A-179	I-17	II-3
A-180	I-17	II-4
A-181	I-17	II-5
A-182	I-17	II-6
A-183	I-17	II-7
A-184	I-17	II-8
A-185	I-17	II-9
A-186	I-17	II-10
A-187	I-17	II-11
A-188	I-18	II-1
A-189	I-18	II-2
A-190	I-18	II-3
A-191	I-18	II-4
A-192	I-18	II-5
A-193	I-18	II-6
A-194	I-18	II-7
A-195	I-18	II-8
A-196	I-18	II-9
A-197	I-18	II-10
A-198	I-18	II-11

According to a further embodiment the mixtures comprise, as active ingredients, component 1) selected from compounds I-1 and I-3 and component 2) selected from pesticides II-1, II-2, II-3, II-4, II-5 and II-11 as defined above, preferably in a weight ratio of from 50 : 1 to 1 : 50; more preferably if from 20 : 1 to 1 : 20.

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).

5 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.

10 This can be obtained by applying the compounds I and at least one further active substance simultaneously, either jointly (e. g. as tank-mix) or separately, or in succession, wherein the time interval between the individual applications is selected to ensure that the active substance applied first still occurs at the site of action in a sufficient amount at the time of application of the further active substance(s). The order of application is not essential for working of the present invention.

15 When applying compound I and a pesticide II sequentially the time between both applications may vary e. g. between 2 hours to 7 days.

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
20 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
25 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 mixtures and compositions, the weight ratio of the component 1) and the component 2) usually is in the range of from 20,000:1 to 1:10, often in the
30 range of from 10,000:1 to 1:1, regularly in the range of from 5,000:1 to 5:1, preferably in the range of from 5,000:1 to 10:1, more preferably in the range of from 2,000:1 to 30:1, even more preferably in the range of from 2,000:1 to 100:1 and in particular in the range of from 1,000:1 to 100:1.

According to a 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
35 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.

According to further embodiments of the mixtures and compositions, the weight ratio of the component 1) and the component 2) usually is in the range of from 10:1 to 1:20,000, often in the
40 range of from 1:1 to 1:10,000, regularly in the range of from 1:5 to 1:5,000, preferably in the range of from 1:10 to 1:5,000, more preferably in the range of from 1:30 to 1:2,000, even more preferably in the range of from 1:100 to 1:2,000 to and in particular in the range of from 1:100 to

1:1,000.

According to the present invention, it may be preferred that the mixtures comprise besides one compound I and one pesticide II as component 3) a further pesticide III (being different than the pesticide II), preferably in a synergistically effective amount. Another embodiment relates to mixtures wherein the component 3) is a further pesticide III selected from groups A) to O):

A) Respiration inhibitors

- Inhibitors of complex III at Q_o site (e. g. strobilurins): 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/flufoxystrobin (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-methylallylideneaminooxymethyl)-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)oxymethyl]phenyl]-N-methoxy-carbamate (A.1.22);
- inhibitors of complex III at Q_i site: cyazofamid (A.2.1), amisulbrom (A.2.2), [(3S,6S,7R,8R)-8-benzyl-3-[(3-acetoxy-4-methoxy-pyridine-2-carbonyl)amino]-6-methyl-4,9-dioxo-1,5-dioxonan-7-yl] 2-methylpropanoate (A.2.3), [(3S,6S,7R,8R)-8-benzyl-3-[[3-(acetoxymethoxy)-4-methoxy-pyridine-2-carbonyl]amino]-6-methyl-4,9-dioxo-1,5-dioxonan-7-yl] 2-methylpropanoate (A.2.4), [(3S,6S,7R,8R)-8-benzyl-3-[(3-isobutoxycarbonyloxy-4-methoxy-pyridine-2-carbonyl)amino]-6-methyl-4,9-dioxo-1,5-dioxonan-7-yl] 2-methylpropanoate (A.2.5), [(3S,6S,7R,8R)-8-benzyl-3-[[3-(1,3-benzodioxol-5-ylmethoxy)-4-methoxy-pyridine-2-carbonyl]amino]-6-methyl-4,9-dioxo-1,5-dioxonan-7-yl] 2-methylpropanoate (A.2.6); (3S,6S,7R,8R)-3-[[[(3-hydroxy-4-methoxy-2-pyridinyl)carbonyl]amino]-6-methyl-4,9-dioxo-8-(phenylmethyl)-1,5-dioxonan-7-yl] 2-methylpropanoate (A.2.7), (3S,6S,7R,8R)-8-benzyl-3-[3-[(isobutyryloxy)methoxy]-4-methoxypicolinamido]-6-methyl-4,9-dioxo-1,5-dioxonan-7-yl isobutyrate (A.2.8);
- inhibitors of complex II (e. g. carboxamides): 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.3.14), penthiopyrad (A.3.15), sedaxane (A.3.16), tecloftalam (A.3.17), thifluzamide (A.3.18), N-(4'-trifluoromethylthiobiphenyl-2-yl)-3-difluoromethyl-1-methyl-1H-pyrazole-4-carboxamide (A.3.19), N-(2-(1,3,3-trimethyl-butyl)-phenyl)-1,3-dimethyl-5-fluoro-1H-pyrazole-4-carboxamide (A.3.20), 3-(difluoromethyl)-1-methyl-N-(1,1,3-trimethylindan-4-yl)pyrazole-4-carboxamide (A.3.21), 3-(trifluoromethyl)-1-methyl-N-(1,1,3-trimethylindan-4-yl)pyrazole-4-carboxamide (A.3.22), 1,3-dimethyl-N-(1,1,3-trimethylindan-4-yl)pyrazole-4-carboxamide (A.3.23), 3-(trifluoromethyl)-1,5-dimethyl-N-(1,1,3-trimethylindan-4-yl)pyrazole-4-carboxamide (A.3.24), 1,3,5-trimethyl-N-(1,1,3-trimethylindan-4-yl)pyrazole-4-carboxamide (A.3.25), N-(7-fluoro-1,1,3-trimethyl-indan-4-yl)-1,3-dimethyl-pyrazole-4-carboxamide

- (A.3.26), N-[2-(2,4-dichlorophenyl)-2-methoxy-1-methyl-ethyl]-3-(difluoromethyl)-1-methyl-pyrazole-4-carboxamide (A.3.27);
- other respiration inhibitors (e. g. complex I, uncouplers): diflumetorim (A.4.1), (5,8-difluoroquinazolin-4-yl)-{2-[2-fluoro-4-(4-trifluoromethylpyridin-2-yloxy)-phenyl]-ethyl}-amine (A.4.2);
- 5 nitrophenyl derivates: binapacryl (A.4.3), dinobuton (A.4.4), dinocap (A.4.5), fluazinam (A.4.6); ferimzone (A.4.7); organometal compounds: fentin salts, such as fentin-acetate (A.4.8), fentin chloride (A.4.9) or fentin hydroxide (A.4.10); ametoctradin (A.4.11); and silthiofam (A.4.12);
- B) Sterol biosynthesis inhibitors (SBI fungicides)
- 10 - C14 demethylase inhibitors (DMI fungicides): 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),
 - 15 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), 1-[*rel*-(2*S*;3*R*)-3-(2-chlorophenyl)-2-(2,4-difluorophenyl)-oxiranylmethyl]-5-thiocyanato-1H-[1,2,4]triazolo (B.1.31), 2-[*rel*-(2*S*;3*R*)-3-(2-chlorophenyl)-2-(2,4-difluorophenyl)-oxiranylmethyl]-2H-[1,2,4]triazole-3-thiol (B.1.32), 2-[2-chloro-4-(4-chlorophenoxy)phenyl]-1-(1,2,4-triazol-1-yl)pentan-2-ol (B.1.33), 1-[4-(4-chlorophenoxy)-2-(trifluoromethyl)phenyl]-1-cyclopropyl-2-(1,2,4-triazol-1-yl)ethanol (B.1.34), 2-[4-(4-chlorophenoxy)-2-(trifluoromethyl)phenyl]-1-(1,2,4-triazol-1-yl)butan-2-ol (B.1.35), 2-[2-chloro-4-(4-chlorophenoxy)phenyl]-1-(1,2,4-triazol-1-yl)butan-2-ol (B.1.36), 2-[4-(4-chlorophenoxy)-2-(trifluoromethyl)phenyl]-3-methyl-1-(1,2,4-triazol-1-yl)butan-2-ol (B.1.37), 2-[4-(4-chlorophenoxy)-2-(trifluoromethyl)phenyl]-1-(1,2,4-triazol-1-yl)propan-2-ol (B.1.38), 2-[2-chloro-4-(4-chlorophenoxy)phenyl]-3-methyl-1-(1,2,4-triazol-1-yl)butan-2-ol (B.1.39), 2-[4-(4-chlorophenoxy)-2-(trifluoromethyl)phenyl]-1-(1,2,4-triazol-1-yl)pentan-2-ol (B.1.40), 2-[4-(4-fluorophenoxy)-2-(trifluoromethyl)phenyl]-1-(1,2,4-triazol-1-yl)propan-2-ol (B.1.41), 2-[2-chloro-4-(4-chlorophenoxy)phenyl]-1-(1,2,4-triazol-1-yl)pent-3-yn-2-ol (B.1.51); imidazoles: imazalil (B.1.42), pefurazoate (B.1.43), prochloraz (B.1.44), triflumizol (B.1.45); pyrimidines, pyridines and piperazines: fenarimol (B.1.46), nuarimol (B.1.47), pyrifenox (B.1.48), triforine (B.1.49), [3-(4-chloro-2-fluoro-phenyl)-5-(2,4-difluorophenyl)isoxazol-4-yl]-(3-pyridyl)methanol (B.1.50);
 - 25
 - 30
 - 35 - 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);
- C) Nucleic acid synthesis inhibitors
- 40 - 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 (mefenoxam, C.1.5), ofurace (C.1.6), oxadixyl (C.1.7);
 - others: hymexazole (C.2.1), octhilinone (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);

D) Inhibitors of cell division and cytoskeleton

- tubulin inhibitors, such as benzimidazoles, thiophanates: benomyl (D1.1), carbendazim (D1.2), fuberidazole (D1.3), thiabendazole (D1.4), thiophanate-methyl (D1.5);
- triazolopyrimidines: 5-chloro-7-(4-methylpiperidin-1-yl)-6-(2,4,6-trifluorophenyl)-[1,2,4]triazolo[1,5-a]pyrimidine (D1.6);
- other cell division inhibitors: diethofencarb (D2.1), ethaboxam (D2.2), pencycuron (D2.3), fluopicolide (D2.4), zoxamide (D2.5), metrafenone (D2.6), pyriofenone (D2.7);

E) Inhibitors of amino acid and protein synthesis

- methionine synthesis inhibitors (anilino-pyrimidines): cyprodinil (E.1.1), mepanipyrim (E.1.2), pyrimethanil (E.1.3);
- protein synthesis inhibitors: blasticidin-S (E.2.1), kasugamycin (E.2.2), kasugamycin hydrochloride-hydrate (E.2.3), mildiomyacin (E.2.4), streptomycin (E.2.5), oxytetracyclin (E.2.6), polyoxine (E.2.7), validamycin A (E.2.8);

F) Signal transduction inhibitors

- MAP / histidine kinase inhibitors: fluoroimid (F.1.1), iprodione (F.1.2), procymidone (F.1.3), vinclozolin (F.1.4), fenciclonil (F.1.5), fludioxonil (F.1.6);
- 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);
- 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) and N-(1-(1-(4-cyano-phenyl)ethanesulfonyl)-but-2-yl) carbamic acid-(4-fluorophenyl) ester (G.3.8);
- compounds affecting cell membrane permeability and fatty acids: propamocarb (G.4.1);
- fatty acid amide hydrolase inhibitors: 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);

H) Inhibitors with Multi Site Action

- inorganic active substances: Bordeaux mixture (H.1.1), copper acetate (H.1.2), copper hydroxide (H.1.3), copper oxychloride (H.1.4), basic copper sulfate (H.1.5), sulfur (H.1.6);
- 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 (e. g. phthalimides, sulfamides, chloronitriles): 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), N-(4-chloro-2-nitro-phenyl)-N-ethyl-4-methyl-

- benzenesulfonamide (H.3.12);
- 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-
5 [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
 - 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);
 - 10 J) Plant defence inducers
 - acibenzolar-S-methyl (J.1.1), probenazole (J.1.2), isotianil (J.1.3), tiadinil (J.1.4), prohexadione-calcium (J.1.5); phosphonates: fosetyl (J.1.6), fosetyl-aluminum (J.1.7), phosphorous acid and its salts (J.1.8), potassium or sodium bicarbonate (J.1.9);
 - K) Unknown mode of action
 - 15 - bronopol (K.1.1), chinomethionat (K.1.2), cyflufenamid (K.1.3), cymoxanil (K.1.4), dazomet (K.1.5), debacarb (K.1.6), diclomezine (K.1.7), difenzoquat (K.1.8), difenzoquat-methylsulfate (K.1.9), diphenylamin (K.1.10), fenpyrazamine (K.1.11), flumetover (K.1.12), flusulfamide (K.1.13), flutianil (K.1.14), methasulfocarb (K.1.15), nitrapyrin (K.1.16), nitrothal-isopropyl (K.1.18), oxathiapiprolin (K.1.19), tolprocarb (K.1.20), oxin-copper (K.1.21),
20 proquinazid (K.1.22), tebufloquin (K.1.23), tecloftalam (K.1.24), triazoxide (K.1.25), 2-butoxy-6-iodo-3-propylchromen-4-one (K.1.26), 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone (K.1.27), 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-fluoro-6-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone
25 (K.1.28), 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-chloro-6-(prop-2-yn-1-yl-oxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone (K.1.29), N-(cyclopropylmethoxyimino-(6-difluoro-methoxy-2,3-difluoro-phenyl)-methyl)-2-phenyl acetamide (K.1.30), N'-(4-(4-chloro-3-trifluoromethyl-phenoxy)-2,5-dimethyl-phenyl)-N-ethyl-N-methyl formamidine (K.1.31), N'-(4-(4-fluoro-3-trifluoromethyl-phenoxy)-2,5-dimethyl-phenyl)-N-ethyl-N-methyl formamidine (K.1.32), N'-(2-methyl-5-trifluoromethyl-4-(3-trimethyl-silanyl-propoxy)-phenyl)-N-ethyl-N-methyl formamidine (K.1.33), N'-(5-difluoromethyl-2-methyl-4-(3-trimethylsilanyl-propoxy)-phenyl)-N-ethyl-N-methyl formamidine (K.1.34),
30 methoxy-acetic acid 6-tert-butyl-8-fluoro-2,3-dimethyl-quinolin-4-yl ester (K.1.35), 3-[5-(4-methylphenyl)-2,3-dimethyl-isoxazolidin-3-yl]-pyridine (K.1.36), 3-[5-(4-chloro-phenyl)-2,3-dimethyl-isoxazolidin-3-yl]-pyridine (pyrisoxazole) (K.1.37), N-(6-methoxy-pyridin-3-yl) cyclopropanecarboxylic acid amide (K.1.38), 5-chloro-1-(4,6-dimethoxy-pyrimidin-2-yl)-2-methyl-1H-benzoimidazole (K.1.39), 2-(4-chloro-phenyl)-N-[4-(3,4-dimethoxy-phenyl)-isoxazol-5-yl]-2-prop-2-ynyloxy-acetamide, ethyl (Z)-3-amino-2-cyano-3-phenyl-prop-2-enoate (K.1.40), picarbutrazox (K.1.41), pentyl N-[6-[[Z]-[(1-methyltetrazol-5-yl)-phenyl-methylene]amino]oxymethyl]-2-pyridyl]carbamate (K.1.42), 2-[2-[(7,8-difluoro-2-methyl-3-quinolyl)oxy]-6-fluoro-phenyl]propan-2-ol (K.1.43), 2-[2-fluoro-6-[(8-fluoro-2-methyl-3-quinolyl)oxy]phen-yl]propan-2-ol (K.1.44), 3-(5-fluoro-3,3,4,4-tetramethyl-3,4-dihydroisoquinolin-1-yl)quinoline (K.1.45), 3-(4,4-difluoro-3,3-dimethyl-3,4-dihydroisoquinolin-1-yl)quin-

oline (K.1.46), 3-(4,4,5-trifluoro-3,3-dimethyl-3,4-dihydroisoquinolin-1-yl)quinoline (K.1.47), 9-fluoro-2,2-dimethyl-5-(3-quinolyl)-3H-1,4-benzoxazepine (K.1.48);

L) Biopesticides

- 5 L1) Microbial pesticides with fungicidal, bactericidal, viricidal and/or plant defense activator activity: *Ampelomyces quisqualis*, *Aspergillus flavus*, *Aureobasidium pullulans*, *Bacillus altitudinis*, *B. amyloliquefaciens*, *B. megaterium*, *B. mojavensis*, *B. mycoides*, *B. pumilus*, *B. simplex*, *B. solisalsi*, *B. subtilis*, *B. subtilis* var. *amyloliquefaciens*, *Candida oleophila*, *C. saitoana*, *Clavibacter michiganensis* (bacteriophages), *Coniothyrium minitans*, *Cryphonectria parasitica*, *Cryptococcus albidus*, *Dilophosphora alopecuri*,
10 *Fusarium oxysporum*, *Clonostachys rosea* f. *catenulate* (also named *Gliocladium catenulatum*), *Gliocladium roseum*, *Lysobacter antibioticus*, *L. enzymogenes*, *Metschnikowia fructicola*, *Microdochium dimerum*, *Microsphaeropsis ochracea*, *Muscodor albus*, *Paenibacillus alvei*, *Paenibacillus polymyxa*, *Pantoea vagans*, *Penicillium bilaiae*, *Phlebiopsis gigantea*, *Pseudomonas* sp., *Pseudomonas chloraphis*,
15 *Pseudozyma flocculosa*, *Pichia anomala*, *Pythium oligandrum*, *Sphaerodes myco-parasitica*, *Streptomyces griseoviridis*, *S. lydicus*, *S. violaceusniger*, *Talaromyces flavus*, *Trichoderma asperelloides*, *T. asperellum*, *T. atroviride*, *T. fertile*, *T. gamsii*, *T. harmatum*, *T. harzianum*, *T. polysporum*, *T. stromaticum*, *T. virens*, *T. viride*, *Typhula phacorrhiza*, *Ulocladium oudemansii*, *Verticillium dahlia*, zucchini yellow mosaic virus (avirulent strain);
20
- L2) Biochemical pesticides with fungicidal, bactericidal, viricidal and/or plant defense activator activity: harpin protein, *Reynoutria sachalinensis* extract;
- L3) Microbial pesticides with insecticidal, acaricidal, molluscidal and/or nematocidal activity:
25 *Agrobacterium radiobacter*, *Bacillus cereus*, *B. firmus*, *B. thuringiensis*, *B. thuringiensis* ssp. *aizawai*, *B. t. ssp. israelensis*, *B. t. ssp. galleriae*, *B. t. ssp. kurstaki*, *B. t. ssp. tenebrionis*, *Beauveria bassiana*, *B. brongniartii*, *Burkholderia* spp., *Chromobacterium subtsugae*, *Cydia pomonella* granulovirus (CpGV), *Cryptophlebia leucotreta* granulovirus (CrleGV), *Flavobacterium* spp., *Helicoverpa armigera* nucleopolyhedrovirus (HearNPV), *Helicoverpa zea* nucleopolyhedrovirus (HzNPV),
30 *Helicoverpa zea* single capsid nucleopolyhedrovirus (HzSNPV), *Heterorhabditis bacteriophora*, *Isaria fumosorosea*, *Lecanicillium longisporum*, *L. muscarium*, *Metarhizium anisopliae*, *Metarhizium anisopliae* var. *anisopliae*, *M. anisopliae* var. *acidum*, *Nomuraea rileyi*, *Paecilomyces fumosoroseus*, *P. lilacinus*, *Paenibacillus popilliae*, *Pasteuria* spp., *P. nishizawae*, *P. penetrans*, *P. ramosa*, *P. thornea*, *P. usgae*,
35 *Pseudomonas fluorescens*, *Spodoptera littoralis* nucleopolyhedrovirus (SpliNPV), *Steinernema carpocapsae*, *S. feltiae*, *S. kraussei*, *Streptomyces galbus*, *S. microflavus*;
- L4) Biochemical pesticides with insecticidal, acaricidal, molluscidal, pheromone and/or nematocidal activity: L-carvone, citral, (E,Z)-7,9-dodecadien-1-yl acetate, ethyl formate, (E,Z)-2,4-ethyl decadienoate (pear ester), (Z,Z,E)-7,11,13-hexadecatrienal, heptyl
40 butyrate, isopropyl myristate, lavanulyl senecioate, cis-jasmone, 2-methyl 1-butanol, methyl eugenol, methyl jasmonate, (E,Z)-2,13-octadecadien-1-ol, (E,Z)-2,13-octadecadien-1-ol acetate, (E,Z)-3,13-octadecadien-1-ol, R-1-octen-3-ol, pentatermanone, (E,Z,Z)-3,8,11-tetradecatrienyl acetate, (Z,E)-9,12-tetradecadien-1-yl acetate, Z-7-

tetradecen-2-one, Z-9-tetradecen-1-yl acetate, Z-11-tetradecenal, Z-11-tetradecen-1-ol, extract of *Chenopodium ambrosioides*, Neem oil, Quillay extract;

- 5 L5) Microbial pesticides with plant stress reducing, plant growth regulator, plant growth promoting and/or yield enhancing activity: *Azospirillum amazonense*, *A. brasilense*, *A. lipoferum*, *A. irakense*, *A. halopraeferens*, *Bradyrhizobium* spp., *B. elkanii*, *B. japonicum*, *B. liaoningense*, *B. lupini*, *Delftia acidovorans*, *Glomus intraradices*, *Mesorhizobium* spp., *Rhizobium leguminosarum* bv. *phaseoli*, *R. l.* bv. *trifolii*, *R. l.* bv. *viciae*, *R. tropici*, *Sinorhizobium meliloti*;

M) Growth regulators

- 10 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, 15 prohexadione-calcium, prohydrojasmon, thidiazuron, triapenthenol, tributyl phosphorotrithioate, 2,3,5-tri-iodobenzoic acid, trinexapac-ethyl and uniconazole;

N) Herbicides

- 20 - acetamides: acetochlor (N.1.1), alachlor, butachlor, dimethachlor, dimethenamid (N.1.2), flufenacet (N.1.3), mefenacet (N.1.4), metolachlor (N.1.5), metazachlor (N.1.6), napropamide, naproanilide, pethoxamid, pretilachlor, propachlor, thenylchlor;
- amino acid derivatives: bilanafos, glyphosate (N.2.1), glufosinate (N.2.2), sulfosate (N.2.3);
- aryloxyphenoxypropionates: clodinafop (N.3.1), cyhalofop-butyl, fenoxaprop (N.3.2), fluazifop (N.3.3), haloxyfop (N.3.4), metamifop, propaquizafop, quizalofop, quizalofop-P-tefuryl;
- 25 - Bipyridyls: diquat, paraquat (N.4.1);
- (thio)carbamates: asulam, butylate, carbetamide, desmedipham, dimepiperate, eptam (EPTC), esprocarb, molinate, orbencarb, phenmedipham (N.5.1), prosulfocarb, pyributicarb, thiobencarb, triallate;
- 30 - cyclohexanediones: butoxydim, clethodim (N.6.1), cycloxydim (N.6.2), profoxydim (N.6.3), sethoxydim (N.6.4), tepraloxym (N.6.5), tralkoxydim;
- dinitroanilines: benfluralin, ethalfluralin, oryzalin, pendimethalin (N.7.1), prodiamine (N.7.2), trifluralin (N.7.3);
- diphenyl ethers: acifluorfen (N.8.1), aclonifen, bifenox, diclofop, ethoxyfen, fomesafen, lactofen, oxyfluorfen;
- 35 - hydroxybenzoxazinones: bomoxynil (N.9.1), dichlobenil, ioxynil;
- imidazolinones: imazamethabenz, imazamox (N.10.1), imazapic (N.10.2), imazapyr (N.10.3), imazaquin (N.10.4), imazethapyr (N.10.5);
- phenoxy acetic acids: clomeprop, 2,4-dichlorophenoxyacetic acid (2,4-D) (N.11.1), 2,4-DB, dichlorprop, MCPA, MCPA-thioethyl, MCPB, Mecoprop;
- 40 - pyrazines: chloridazon (N.11.1), flufenpyr-ethyl, fluthiacet, norflurazon, pyridate;
- pyridines: aminopyralid, clopyralid (N.12.1), diflufenican, dithiopyr, fluridone, fluroxypyr (N.12.2), picloram (N.12.3), picolinafen (N.12.4), thiazopyr;
- sulfonamide ureas: amidosulfuron, azimsulfuron, bensulfuron (N.13.1), chlorimuron-ethyl

- (N.13.2), chlorsulfuron, cinosulfuron, cyclosulfamuron (N.13.3), ethoxysulfuron, flzasulfuron, flucetosulfuron, flupyrsulfuron, foramsulfuron, halosulfuron, imazosulfuron, iodosulfuron (N.13.4), mesosulfuron (N.13.5), metazosulfuron, metsulfuron-methyl (N.13.6), nicosulfuron (N.13.7), oxasulfuron, primisulfuron, prosulfuron, pyrazosulfuron, rimsulfuron
 5 (N.13.8), sulfometuron, sulfosulfuron, thifensulfuron, triasulfuron, tribenuron, trifloxysulfuron, triflusulfuron (N.13.9), tritosulfuron, 1-((2-chloro-6-propyl-imidazo[1,2-b]pyridazin-3-yl)sulfonyl)-3-(4,6-dimethoxy-pyrimidin-2-yl)urea;
- triazines: ametryn, atrazine (N.14.1), cyanazine, dimethametryn, ethiozin, hexazinone (N.14.2), metamitron, metribuzin, prometryn, simazine, terbutylazine, terbutryn, triaziflam,
 10 trifludimoxazin (N.14.3);
 - ureas: chlorotoluron, daimuron, diuron (N.15.1), fluometuron, isoproturon, linuron, metha-benzthiazuron, tebuthiuron;
 - other acetolactate synthase inhibitors: bispyribac-sodium, cloransulam-methyl, diclosulam, florasulam (N.16.1), flucarbazone, flumetsulam, metosulam, ortho-sulfamuron, penoxsulam,
 15 propoxycarbazone, pyribambenz-propyl, pyribenzoxim, pyriftalid, pyriminobac-methyl, pyrimisulfan, pyrithiobac, pyroxasulfone (N.16.2), pyroxsulam;
 - others: amicarbazone, aminotriazole, anilofos, beflubutamid, benazolin, bencarbazone, benfluresate, benzofenap, bentazone (N.17.1), benzobicyclon, bicyclopyrone, bromacil, bromobutide, butafenacil, butamifos, cafenstrole, carfentrazone, cinidon-ethyl
 20 (N.17.2), chlorthal, cinmethylin (N.17.3), clomazone (N.17.4), cumyluron, cyprosulfamide, dicamba (N.17.5), difenzoquat, diflufenzopyr (N.17.6), *Drechslera monoceras*, endothal, ethofumesate, etobenzanid, fenoxasulfone, fentrazamide, flumiclorac-pentyl, flumioxazin, flupoxam, flurochloridone, flurtamone, indanofan, isoxaben, isoxaflutole, lenacil, propanil, propyzamide, quinclorac (N.17.7), quinmerac (N.17.8), mesotrione (N.17.9), methyl arsonic acid, naptalam, oxadiargyl, oxadiazon, oxaziclomefone, pentoxazone, pinoxaden, pyraclonil,
 25 pyraflufen-ethyl, pyrasulfotole, pyrazoxyfen, pyrazolynate, quinochloramine, saflufenacil (N.17.10), sulcotrione (N.17.11), sulfentrazone, terbacil, tefuryltrione, tembotrione, thiencarbazone, topramezone (N.17.12), (3-[2-chloro-4-fluoro-5-(3-methyl-2,6-dioxo-4-trifluoromethyl-3,6-dihydro-2H-pyrimidin-1-yl)-phenoxy]-pyridin-2-yloxy)-acetic acid ethyl
 30 ester, 6-amino-5-chloro-2-cyclopropyl-pyrimidine-4-carboxylic acid methyl ester, 6-chloro-3-(2-cyclopropyl-6-methyl-phenoxy)-pyridazin-4-ol, 4-amino-3-chloro-6-(4-chloro-phenyl)-5-fluoro-pyridine-2-carboxylic acid, 4-amino-3-chloro-6-(4-chloro-2-fluoro-3-methoxy-phenyl)-pyridine-2-carboxylic acid methyl ester, and 4-amino-3-chloro-6-(4-chloro-3-dimethylamino-2-fluoro-phenyl)-pyridine-2-carboxylic acid methyl ester;
- 35 O) Insecticides
- organo(thio)phosphates: acephate (O.1.1), azamethiphos (O.1.2), azinphos-methyl (O.1.3), chlorpyrifos (O.1.4), chlorpyrifos-methyl (O.1.5), chlorfenvinphos (O.1.6), diazinon (O.1.7), dichlorvos (O.1.8), dicrotophos (O.1.9), dimethoate (O.1.10), disulfoton (O.1.11), ethion (O.1.12), fenitrothion (O.1.13), fenthion (O.1.14), isoxathion (O.1.15), malathion (O.1.16),
 40 methamidophos (O.1.17), methidathion (O.1.18), methyl-parathion (O.1.19), mevinphos (O.1.20), monocrotophos (O.1.21), oxydemeton-methyl (O.1.22), paraoxon (O.1.23), parathion (O.1.24), phenthoate (O.1.25), phosalone (O.1.26), phosmet (O.1.27), phosphamidon (O.1.28), phorate (O.1.29), phoxim (O.1.30), pirimiphos-methyl (O.1.31),

- profenofos (O.1.32), prothiofos (O.1.33), sulprophos (O.1.34), tetrachlorvinphos (O.1.35), terbufos (O.1.36), triazophos (O.1.37), trichlorfon (O.1.38);
- carbamates: alanycarb (O.2.1), aldicarb (O.2.2), bendiocarb (O.2.3), benfuracarb (O.2.4), carbaryl (O.2.5), carbofuran (O.2.6), carbosulfan (O.2.7), fenoxycarb (O.2.8), furathiocarb (O.2.9), methiocarb (O.2.10), methomyl (O.2.11), oxamyl (O.2.12), pirimicarb (O.2.13), propoxur (O.2.14), thiodicarb (O.2.15), triazamate (O.2.16);
 - pyrethroids: allethrin (O.3.1), bifenthrin (O.3.2), cyfluthrin (O.3.3), cyhalothrin (O.3.4), cyphenothrin (O.3.5), cypermethrin (O.3.6), alpha-cypermethrin (O.3.7), beta-cypermethrin (O.3.8), zeta-cypermethrin (O.3.9), deltamethrin (O.3.10), esfenvalerate (O.3.11), etofenprox (O.3.11), fenpropathrin (O.3.12), fenvalerate (O.3.13), imiprothrin (O.3.14), lambda-cyhalothrin (O.3.15), permethrin (O.3.16), prallethrin (O.3.17), pyrethrin I and II (O.3.18), resmethrin (O.3.19), silafluofen (O.3.20), tau-fluvalinate (O.3.21), tefluthrin (O.3.22), tetramethrin (O.3.23), tralomethrin (O.3.24), transfluthrin (O.3.25), profluthrin (O.3.26), dimefluthrin (O.3.27);
 - insect growth regulators: a) chitin synthesis inhibitors: benzoylureas: chlorfluazuron (O.4.1), cyramazin (O.4.2), diflubenzuron (O.4.3), flucyclohexuron (O.4.4), flufenoxuron (O.4.5), hexaflumuron (O.4.6), lufenuron (O.4.7), novaluron (O.4.8), teflubenzuron (O.4.9), triflumuron (O.4.10); buprofezin (O.4.11), diofenolan (O.4.12), hexythiazox (O.4.13), etoxazole (O.4.14), clofentazine (O.4.15); b) ecdysone antagonists: halofenozide (O.4.16), methoxyfenozide (O.4.17), tebufenozide (O.4.18), azadirachtin (O.4.19); c) juvenoids: pyriproxyfen (O.4.20), methoprene (O.4.21), fenoxycarb (O.4.22); d) lipid biosynthesis inhibitors: spirotetramat (O.4.23), spiromesifen (O.4.24), spirotetramat (O.4.24);
 - nicotinic receptor agonists/antagonists compounds: clothianidin (O.5.1), dinotefuran (O.5.2), flupyradifurone (O.5.3), imidacloprid (O.5.4), thiamethoxam (O.5.5), nitenpyram (O.5.6), acetamiprid (O.5.7), thiacloprid (O.5.8), 1-(2-chloro-thiazol-5-ylmethyl)-2-nitrimino-3,5-dimethyl-[1,3,5]triazinane (O.5.9);
 - GABA antagonist compounds: endosulfan (O.6.19), ethiprole (O.6.2), fipronil (O.6.3), vaniliprole (O.6.4), pyrafluprole (O.6.5), pyriprole (O.6.6), 5-amino-1-(2,6-dichloro-4-methylphenyl)-4-sulfenamoyl-1H-pyrazole-3-carbothioic acid amide (O.6.7);
 - macrocyclic lactone insecticides: abamectin (O.7.1), emamectin (O.7.2), milbemectin (O.7.3), lepimectin (O.7.4), spinosad (O.7.5), spinetoram (O.7.6);
 - mitochondrial electron transport inhibitor (METI) I acaricides: fenazaquin (O.8.1), pyridaben (O.8.2), tebufenpyrad (O.8.3), tolfenpyrad (O.8.4), flufenerim (O.8.5);
 - METI II and III compounds: acequinocyl (O.9.1), fluacyprim (O.9.2), hydramethylnon (O.9.3);
 - Uncouplers: chlorfenapyr (O.10.1);
 - oxidative phosphorylation inhibitors: cyhexatin (O.11.1), diafenthiuron (O.11.2), fenbutatin oxide (O.11.3), propargite (O.11.4);
 - moulting disruptor compounds: cryomazine (O.12.1);
 - mixed function oxidase inhibitors: piperonyl butoxide (O.13.1);
 - sodium channel blockers: indoxacarb (O.14.1), metaflumizone (O.14.2);
 - ryanodine receptor inhibitors: chlorantraniliprole (O.15.1), cyantraniliprole (O.15.2), flubendiamide (O.15.3), N-[4,6-dichloro-2-[(diethyl-lambda-4-sulfanylidene)carbamoyle]-phenyl]-2-(3-chloro-2-pyridyl)-5-(trifluoromethyl)pyrazole-3-carboxamide (O.15.4); N-[4-chloro-2-[(di-

ethyl-lambda-4-sulfanylidene)carbamoyl]-6-methyl-phenyl]-2-(3-chloro-2-pyridyl)-5-(trifluoromethyl)pyrazole-3-carboxamide (O.15.5); N-[4-chloro-2-[(di-2-propyl-lambda-4-sulfanylidene)carbamoyl]-6-methyl-phenyl]-2-(3-chloro-2-pyridyl)-5-(trifluoromethyl)pyrazole-3-carboxamide (O.15.6); N-[4,6-dichloro-2-[(di-2-propyl-lambda-4-sulfanylidene)carbamoyl]-phenyl]-2-(3-chloro-2-pyridyl)-5-(trifluoromethyl)pyrazole-3-carboxamide (O.15.7); N-[4,6-dichloro-2-[(diethyl-lambda-4-sulfanylidene)carbamoyl]-phenyl]-2-(3-chloro-2-pyridyl)-5-(difluoromethyl)pyrazole-3-carboxamide (O.15.8); N-[4,6-dibromo-2-[(di-2-propyl-lambda-4-sulfanylidene)carbamoyl]-phenyl]-2-(3-chloro-2-pyridyl)-5-(trifluoromethyl)pyrazole-3-carboxamide (O.15.9); N-[4-chloro-2-[(di-2-propyl-lambda-4-sulfanylidene)carbamoyl]-6-cyanophenyl]-2-(3-chloro-2-pyridyl)-5-(trifluoromethyl)pyrazole-3-carboxamide (O.15.10); N-[4,6-dibromo-2-[(diethyl-lambda-4-sulfanylidene)carbamoyl]-phenyl]-2-(3-chloro-2-pyridyl)-5-(trifluoromethyl)pyrazole-3-carboxamide (O.15.11);

- others: benclotiaz (O.16.1), bifenazate (O.16.2), artap (O.16.3), flonicamid (O.16.4), pyridalyl (O.16.5), pymetrozine (O.16.6), sulfur (O.16.7), thiocyclam (O.16.8), cyenopyrafen (O.16.9), flupyrazofos (O.16.10), cyflumetofen (O.16.11), amidoflumet (O.16.12), imicyafos (O.16.13), bistrifluron (O.16.14), pyrifluquinazon (O.16.15), 1,1'-[(3S,4R,4aR,6S,6aS,12R,12aS,12bS)-4-[(2-cyclopropylacetyl)oxy]methyl]-1,3,4,4a,5,6,6a,12,12a,12b-decahydro-12-hydroxy-4,6a,12b-trimethyl-11-oxo-9-(3-pyridinyl)-2H,11H-naphtho[2,1-b]pyrano[3,4-e]pyran-3,6-diyl] cyclopropaneacetic acid ester (O.16.16).

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 11/028657, WO2012/168188, WO 2007/006670, WO 2011/77514; WO13/047749, 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 13/024010 and WO 13/047441, WO 13/162072, WO 13/092224, WO 11/135833).

Particularly preferred are the following ternary mixtures AA-1 to AA-198 which comprise component 1 and component 2 as listed in each row of Table A (A-1 to A-198) and in addition in each case as component 3, the further pesticide azoxystrobin.

Particularly preferred are the following ternary mixtures AB-1 to AB-198 which comprise component 1 and component 2 as listed in each row of Table A (A-1 to A-198) and in addition in each case as component 3, the further pesticide kresoxim-methyl.

Particularly preferred are the following ternary mixtures AC-1 to AC-198 which comprise component 1 and component 2 as listed in each row of Table A (A-1 to A-198) and in addition in each case as component 3, the further pesticide mandestrobin.

5 Particularly preferred are the following ternary mixtures AD-1 to AD-198 which comprise component 1 and component 2 as listed in each row of Table A (A-1 to A-198) and in addition in each case as component 3, the further pesticide metaminostrobin.

Particularly preferred are the following ternary mixtures AE-1 to AE-198 which comprise component 1 and component 2 as listed in each row of Table A (A-1 to A-198) and in addition in each case as component 3, the further pesticide picoxystrobin.

10 Particularly preferred are the following ternary mixtures AF-1 to AF-198 which comprise component 1 and component 2 as listed in each row of Table A (A-1 to A-198) and in addition in each case as component 3, the further pesticide pyraclostrobin.

15 Particularly preferred are the following ternary mixtures AG-1 to AG-198 which comprise component 1 and component 2 as listed in each row of Table A (A-1 to A-198) and in addition in each case as component 3, the further pesticide trifloxystrobin.

Particularly preferred are the following ternary mixtures AH-1 to AH-198 which comprise component 1 and component 2 as listed in each row of Table A (A-1 to A-198) and in addition in each case as component 3, the further pesticide benzovindiflupyr.

20 Particularly preferred are the following ternary mixtures AI-1 to AI-198 which comprise component 1 and component 2 as listed in each row of Table A (A-1 to A-198) and in addition in each case as component 3, the further pesticide bixafen.

Particularly preferred are the following ternary mixtures AJ-1 to AJ-198 which comprise component 1 and component 2 as listed in each row of Table A (A-1 to A-198) and in addition in each case as component 3, the further pesticide boscalid.

25 Particularly preferred are the following ternary mixtures AK-1 to AK-198 which comprise component 1 and component 2 as listed in each row of Table A (A-1 to A-198) and in addition in each case as component 3, the further pesticide fluopyram.

30 Particularly preferred are the following ternary mixtures AL-1 to AL-198 which comprise component 1 and component 2 as listed in each row of Table A (A-1 to A-198) and in addition in each case as component 3, the further pesticide fluxapyroxad.

Particularly preferred are the following ternary mixtures AM-1 to AM-198 which comprise component 1 and component 2 as listed in each row of Table A (A-1 to A-198) and in addition in each case as component 3, the further pesticide 3-(difluoromethyl)-1-methyl-*N*-(1,1,3-trimethylindan-4-yl)pyrazole-4-carboxamide.

35 Particularly preferred are the following ternary mixtures AN-1 to AN-198 which comprise component 1 and component 2 as listed in each row of Table A (A-1 to A-198) and in addition in each case as component 3, the further pesticide 3-(trifluoromethyl)-1-methyl-*N*-(1,1,3-trimethylindan-4-yl)pyrazole-4-carboxamide.

40 Particularly preferred are the following ternary mixtures AO-1 to AO-198 which comprise component 1 and component 2 as listed in each row of Table A (A-1 to A-198) and in addition in each case as component 3, the further pesticide 1,3-dimethyl-*N*-(1,1,3-trimethylindan-4-yl)pyrazole-4-carboxamide.

Particularly preferred are the following ternary mixtures AO-1 to AO-198 which comprise

component 1 and component 2 as listed in each row of Table A (A-1 to A-198) and in addition in each case as component 3, the further pesticide 3-(trifluoromethyl)-1,5-dimethyl-*N*-(1,1,3-trimethylindan-4-yl)-pyrazole-4-carboxamide.

5 Particularly preferred are the following ternary mixtures AP-1 to AP-198 which comprise component 1 and component 2 as listed in each row of Table A (A-1 to A-198) and in addition in each case as component 3, the further pesticide 1,3,5-tri-methyl-*N*-(1,1,3-trimethylindan-4-yl)pyrazole-4-carboxamide.

10 Particularly preferred are the following ternary mixtures AQ-1 to AQ-198 which comprise component 1 and component 2 as listed in each row of Table A (A-1 to A-198) and in addition in each case as component 3, the further pesticide cyproconazole.

Particularly preferred are the following ternary mixtures AR-1 to AR-198 which comprise component 1 and component 2 as listed in each row of Table A (A-1 to A-198) and in addition in each case as component 3, the further pesticide difenoconazole.

15 Particularly preferred are the following ternary mixtures AS-1 to AS-198 which comprise component 1 and component 2 as listed in each row of Table A (A-1 to A-198) and in addition in each case as component 3, the further pesticide epoxiconazole.

Particularly preferred are the following ternary mixtures AT-1 to AT-198 which comprise component 1 and component 2 as listed in each row of Table A (A-1 to A-198) and in addition in each case as component 3, the further pesticide metconazole.

20 Particularly preferred are the following ternary mixtures AU-1 to AU-198 which comprise component 1 and component 2 as listed in each row of Table A (A-1 to A-198) and in addition in each case as component 3, the further pesticide propiconazole.

25 Particularly preferred are the following ternary mixtures AV-1 to AV-198 which comprise component 1 and component 2 as listed in each row of Table A (A-1 to A-198) and in addition in each case as component 3, the further pesticide prothioconazole.

Particularly preferred are the following ternary mixtures AW-1 to AW-198 which comprise component 1 and component 2 as listed in each row of Table A (A-1 to A-198) and in addition in each case as component 3, the further pesticide tebuconazole.

30 Particularly preferred are the following ternary mixtures AX-1 to AX-198 which comprise component 1 and component 2 as listed in each row of Table A (A-1 to A-198) and in addition in each case as component 3, the further pesticide triticonazole.

Particularly preferred are the following ternary mixtures AY-1 to AY-198 which comprise component 1 and component 2 as listed in each row of Table A (A-1 to A-198) and in addition in each case as component 3, the further pesticide fenpropimorph.

35 Particularly preferred are the following ternary mixtures AZ-1 to AZ-198 which comprise component 1 and component 2 as listed in each row of Table A (A-1 to A-198) and in addition in each case as component 3, the further pesticide fenpropidin.

40 Particularly preferred are the following ternary mixtures AAA-1 to AAA-198 which comprise component 1 and component 2 as listed in each row of Table A (A-1 to A-198) and in addition in each case as component 3, the further pesticide spiroxamine.

Particularly preferred are the following ternary mixtures AAB-1 to AAB-198 which comprise component 1 and component 2 as listed in each row of Table A (A-1 to A-198) and in addition in each case as component 3, the further pesticide mancozeb.

Particularly preferred are the following ternary mixtures AAC-1 to AAC-198 which comprise component 1 and component 2 as listed in each row of Table A (A-1 to A-198) and in addition in each case as component 3, the further pesticide chlorothalonil.

5 Particularly preferred are the following ternary mixtures AAD-1 to AAD-198 which comprise component 1 and component 2 as listed in each row of Table A (A-1 to A-198) and in addition in each case as component 3, the further pesticide 2,6-di-methyl-1H,5H-[1,4]dithiino[2,3-c:5,6-c']dipyrrole-1,3,5,7(2H,6H)-tetraone.

10 Particularly preferred are the following ternary mixtures AAE-1 to AAE-198 which comprise component 1 and component 2 as listed in each row of Table A (A-1 to A-198) and in addition in each case as component 3, the further pesticide thiphanate-methyl.

Particularly preferred are the following ternary mixtures AAF-1 to AAF-198 which comprise component 1 and component 2 as listed in each row of Table A (A-1 to A-198) and in addition in each case as component 3, the further pesticide metrafenone.

15 Particularly preferred are the following ternary mixtures AAG-1 to AAG-198 which comprise component 1 and component 2 as listed in each row of Table A (A-1 to A-198) and in addition in each case as component 3, the further pesticide pyriofenone.

20 Particularly preferred are the following ternary mixtures AAH-1 to AAH-198 which comprise component 1 and component 2 as listed in each row of Table A (A-1 to A-198) and in addition in each case as component 3, the further pesticide 2-[2-chloro-4-(4-chlorophenoxy)phenyl]-1-(1,2,4-triazol-1-yl)pentan-2-ol.

Particularly preferred are the following ternary mixtures AAI-1 to AAI-198 which comprise component 1 and component 2 as listed in each row of Table A (A-1 to A-198) and in addition in each case as component 3, the further pesticide 1-[4-(4-chlorophenoxy)-2-(trifluoromethyl)phenyl]-1-cyclopropyl-2-(1,2,4-triazol-1-yl)ethanol.

25 Particularly preferred are the following ternary mixtures AAJ-1 to AAJ-198 which comprise component 1 and component 2 as listed in each row of Table A (A-1 to A-198) and in addition in each case as component 3, the further pesticide 2-[4-(4-chlorophenoxy)-2-(trifluoromethyl)phenyl]-1-(1,2,4-triazol-1-yl)butan-2-ol.

30 Particularly preferred are the following ternary mixtures AAK-1 to AAK-198 which comprise component 1 and component 2 as listed in each row of Table A (A-1 to A-198) and in addition in each case as component 3, the further pesticide 2-[2-chloro-4-(4-chlorophenoxy)phenyl]-1-(1,2,4-triazol-1-yl)butan-2-ol.

35 Particularly preferred are the following ternary mixtures AAL-1 to AAL-198 which comprise component 1 and component 2 as listed in each row of Table A (A-1 to A-198) and in addition in each case as component 3, the further pesticide 2-[4-(4-chlorophenoxy)-2-(trifluoromethyl)phenyl]-3-methyl-1-(1,2,4-triazol-1-yl)butan-2-ol.

40 Particularly preferred are the following ternary mixtures AAM-1 to AAM-198 which comprise component 1 and component 2 as listed in each row of Table A (A-1 to A-198) and in addition in each case as component 3, the further pesticide 2-[4-(4-chlorophenoxy)-2-(trifluoromethyl)phenyl]-1-(1,2,4-triazol-1-yl)propan-2-ol.

Particularly preferred are the following ternary mixtures AAN-1 to AAN-198 which comprise component 1 and component 2 as listed in each row of Table A (A-1 to A-198) and in addition in each case as component 3, the further pesticide 2-[2-chloro-4-(4-chlorophenoxy)phenyl]-

3-methyl-1-(1,2,4-triazol-1-yl)butan-2-ol.

Particularly preferred are the following ternary mixtures AAO-1 to AAO-198 which comprise component 1 and component 2 as listed in each row of Table A (A-1 to A-198) and in addition in each case as component 3, the further pesticide 2-[4-(4-chlorophenoxy)-2-(trifluoromethyl)-phenyl]-1-(1,2,4-triazol-1-yl)pentan-2-ol.

Particularly preferred are the following ternary mixtures AAP-1 to AAP-198 which comprise component 1 and component 2 as listed in each row of Table A (A-1 to A-198) and in addition in each case as component 3, the further pesticide 2-[4-(4-fluorophenoxy)-2-(trifluoromethyl)-phenyl]-1-(1,2,4-triazol-1-yl)propan-2-ol.

Particularly preferred are the following ternary mixtures AAQ-1 to AAQ-198 which comprise component 1 and component 2 as listed in each row of Table A (A-1 to A-198) and in addition in each case as component 3, the further pesticide 2-[2-chloro-4-(4-chlorophenoxy)phenyl]-1-(1,2,4-triazol-1-yl)pent-3-yn-2-ol.

In the ternary mixtures, i.e. compositions according to the invention comprising the component 1) and component 2) and a further 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.

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 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.

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 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 by immersion or pouring.

Preferably, treatment of plant propagation materials with the inventive combination of compound I and compounds 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.

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 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 PEG moieties.

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

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) 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, 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. 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 cassicola* (leaf spots) on soybeans and ornamentals; *Cycloconium* spp., e. g. *C. oleaginum* on olive trees; *Cylindrocarpon* spp. (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. 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 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* (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* 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 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;

5 *Peronospora* spp. (downy mildew) on cabbage (e. g. *P. brassicae*), rape (e. g. *P. parasitica*), 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 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-

15 leaved trees (e. g. *P. ramorum*: sudden oak death); *Plasmodiophora brassicae* (club root) on 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 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; *Pseudopezizicola 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, soy-

30 beans, sugar beets, vegetables and various other plants (e. g. *P. ultimum* or *P. aphanidermatum*); *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

35 wheat or barley; *Rhizopus stolonifer* (black mold, soft rot) on strawberries, carrots, cabbage, 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

40 soybeans, *S. tritici* (Septoria blotch) on wheat and *S.* (syn. *Stagonospora*) *nodorum* (Stagonospora blotch) on cereals; *Uncinula* (syn. *Erysiphe*) *necator* (powdery mildew, anamorph: *Oidium tuckeri*) on vines; *Setosphaeria* 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
5 potatoes (potato wart disease); *Taphrina* spp., e. g. *T. deformans* (leaf curl disease) on peaches 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
10 wheat; *Urocystis* spp., e. g. *U. occulta* (stem smut) on rye; *Uromyces* spp. (rust) on vegetables, 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,
15 vegetables and field crops, e. g. *V. dahliae* on strawberries, rape, potatoes and tomatoes.

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

The invention also relates to agrochemical compositions comprising an auxiliary and at least
20 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.
25 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 pesticides II, their N-oxides and salts can be converted into customary types of agrochemical compositions, e. g. solutions, emulsions, suspensions, dusts, powders,
30 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, 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
35 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, 6th Ed. May 2008, CropLife International.

The compositions are prepared in a known manner, such as described by Mollet and Grubemann, Formulation technology, Wiley VCH, Weinheim, 2001; or Knowles, New
40 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, 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.

5 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).

10 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.

15 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

20 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.

25 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.

30 When used in the protection of materials or stored products, the amount of active substance 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.

35 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 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.

40 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 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.

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 packaged and used as combination such as a kit of parts.

5 According to one embodiment, individual components of the composition according to the 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 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.

10 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).

15 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 fungicidal action of the compositions according to the invention can be shown by the tests described below.

20

Microtests

The active compounds were formulated separately as a stock solution having a concentration of 10000 ppm in dimethyl sulfoxide.

25 The stock solutions were mixed according to the ratio, pipetted onto a micro titer plate (MTP) and diluted with water to the stated concentrations. A spore suspension of the respective plant pathogen in an aqueous nutrient solution as described for the respective plant pathogen was then added. The plates were placed in a water vapor-saturated chamber at a temperature of 18 °C. Using an absorption photometer, the MTPs were measured at 405 nm 7 days after the inoculation.

30 The measured parameters were compared to the growth of the active compound-free control variant (100%) and the fungus-free and active compound-free blank value to determine the relative growth in % of the pathogens in the respective active compounds. These percentages were converted into efficacies using Abbot's formula. The expected efficacies of active compound mixtures were determined using Colby's formula and compared with the observed
35 efficacies.

Use example 1. Activity against rice blast *Pyricularia oryzae* pathogen

40 A spore suspension of a Qol resistant *Pyricularia oryzae* isolate (1328) in an aqueous biomalt or yeast-bactopeptone-glycerine solution was used.

Table 1:

Active compound / mixture	Concentration (ppm)	Mixture ratio	Observed efficacy	Calculated efficacy acc. to Colby (%)
I-3	0.25	-	54	
	0.063	-	2	
I-1	0.25	-	65	
	0.063	-	1	
II-3	0.016	-	44	
II-1	0.016	-	0	
II-11	0.063	-	2	
II-2	0.016	-	2	
II-4	0.063	-	1	
II-5	0.25	-	44	
I-3 + II-3	0.063 + 0.016	4 : 1	67	45
I-3 + II-1	0.25 + 0.016	16 : 1	75	54
I-3 + II-11	0.25 + 0.063	4 : 1	72	55
I-3 + II-2	0.25 + 0.016	16 : 1	79	55
I-3 + II-4	0.25 + 0.063	4 : 1	75	54
I-3 II-5	0.063 + 0.25	1 : 4	65	45
I-1 II-1	0.25 + 0.016	16 : 1	85	65
I-1 II-2	0.25 + 0.016	16 : 1	86	65
I-1 II-4	0.25 + 0.063	4 : 1	85	66
I-1 II-5	0.063 + 0.25	1 : 4	72	45

5 Use example 2. Activity against causal agent of leaf blotch *Septoria tritici*

A spore suspension of a Qol resistant *Septoria tritici* isolate (3573) in an aqueous biomalt or yeast-bactopeptone-glycerine solution was used.

Table 2:

Active compound / mixture	Concentration (ppm)	Mixture ratio	Observed efficacy	Calculated efficacy acc. to Colby (%)
I-3	0.063	-	32	
	0.016	-	10	
I-1	0.25	-	49	
	0.063	-	21	
	0.016	-	10	
II-3	0.25	-	17	
II-1	0.25	-	23	
I-3 + II-3	0.063 + 0.25	1 : 4	64	44
I-3 + II-3	0.016 + 0.25	1 : 16	75	25
I-3 + II-1	0.016 + 0.25	1 : 16	57	30
I-1 + II-3	0.25 + 0.25	1 : 1	81	58
I-1 + II-3	0.063 + 0.25	1 : 4	72	35
I-1 + II-3	0.016 + 0.25	1 : 16	79	25
I-1 + II-1	0.016 + 0.25	1 : 16	63	31

5

Use example 3. Activity against early blight pathogen *Alternaria solani*

A spore suspension of a Qol resistant *Alternaria solani* isolate (141) in an aqueous biomalt or yeast-bactopeptone-glycerine solution was used.

10

Table 3:

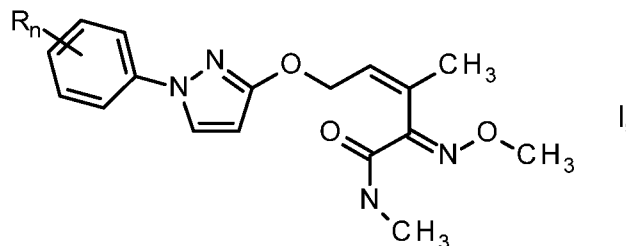
Active compound / mixture	Concentration (ppm)	Mixture ratio	Observed efficacy	Calculated efficacy acc. to Colby (%)
I-3	0.25	-	0	
	0.063	-	0	
I-1	0.25	-	0	
II-3	0.016	-	0	
II-1	0.063	-	0	
	0.016	-	0	

Active compound / mixture	Concentration (ppm)	Mixture ratio	Observed efficacy	Calculated efficacy acc. to Colby (%)
II-11	0.25	-	15	
	0.063	-	0	
	0.016	-	0	
II-2	0.25	-	0	
	0.063	-	0	
	0.016	-	0	
II-4	0.063	-	0	
	0.016	-	0	
II-5	0.016	-	6	
I-3 + II-1	0.25 + 0.063	4 : 1	28	0
I-3 + II-11	0.063 + 0.25	1 : 4	34	15
I-3 + II-2	0.25 + 0.25	1 : 1	25	0
I-3 + II-2	0.063 + 0.25	1 : 4	22	0
I-3 + II-4	0.25 + 0.063	4 : 1	31	0
I-1 + II-3	0.25 + 0.016	16 : 1	28	0
I-1 + II-1	0.25 + 0.016	16 : 1	26	0
I-1 + II-11	0.25 + 0.063	4 : 1	35	0
I-1 + II-11	0.25 + 0.016	16 : 1	40	0
I-1 + II-2	0.25 + 0.063	4 : 1	22	0
I-1 + II-2	0.25 + 0.016	16 : 1	45	0
I-1 + II-4	0.25 + 0.063	4 : 1	32	0
I-1 + II-4	0.25 + 0.016	16 : 1	36	0
I-1 + II-5	0.25 + 0.016	16 : 1	39	6

Claims

1. A mixture, comprising as active components

5 2) 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, C₁-C₄-alkyl, C₂-C₄-alkenyl, C₂-C₈-alkynyl, C₁-C₄-haloalkyl, C₁-C₄-alkoxy, C₁-C₄-haloalkoxy, C₁-C₄-alkylsulfanyl, C₁-C₄-haloalkylsulfanyl, C₁-C₆-alkoxyimino-C₁-C₄-alkyl, C₂-C₆-alkenyloxyimino-C₁-C₄-alkyl, C₂-C₆-alkynyloxyimino-C₁-C₄-alkyl, C₁-C₄-alkoxyimino-C₁-C₄-alkyl, C₁-C₆-alkoxyimino-, C₂-C₆-alkenyloxyimino-, C₂-C₆-alkynyloxyimino-, C₂-C₆-haloalkenyloxyimino-, C₃-C₆-cycloalkyl, C₃-C₆-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^c for their part may carry 1, 2, 3 or up to the maximum possible number of identical or different groups R^a:

R^a, which may be the same or different to any other R^a, is halogen, C₁-C₄-alkyl or C₁-C₄-haloalkyl;

25

and

3) at least one pesticide II selected from:

30 1-[3-chloro-2-[[1-(4-chlorophenyl)-1H-pyrazol-3-yl]oxymethyl]phenyl]-4-methyl-tetrazol-5-one (II-1), 1-[3-bromo-2-[[1-(4-chlorophenyl)pyrazol-3-yl]oxymethyl]phenyl]-4-methyl-tetrazol-5-one (II-2), 1-[2-[[1-(4-chlorophenyl)pyrazol-3-yl]oxymethyl]-3-methyl-phenyl]-4-methyl-tetrazol-5-one (II-3), 1-[2-[[1-(4-chlorophenyl)pyrazol-3-yl]oxymethyl]-3-fluoro-phenyl]-4-methyl-tetrazol-5-one (II-4), 1-[2-[[1-(2,4-dichlorophenyl)pyrazol-3-yl]oxymethyl]-3-fluoro-phenyl]-4-methyl-tetrazol-5-one (II-5), 1-[2-[[4-(4-chlorophenyl)thiazol-2-yl]oxymethyl]-3-methyl-phenyl]-4-methyl-tetrazol-5-one (II-6), 1-[3-chloro-2-[[4-(p-tolyl)thiazol-2-yl]oxymethyl]phenyl]-4-methyl-tetrazol-5-one (II-7), 1-[3-cyclopropyl-2-[[2-methyl-4-(1-methylpyrazol-3-yl)phenoxy]methyl]phenyl]-4-methyl-tetrazol-5-one (II-8), 1-[3-(di-fluoromethoxy)-2-[[2-methyl-4-(1-methylpyrazol-3-yl)phenoxy]methyl]phenyl]-4-methyl-

35

tetrazol-5-one (II-9), 1-methyl-4-[3-methyl-2-[[2-methyl-4-(1-methylpyrazol-3-yl)phenoxy]methyl]phenyl]tetrazol-5-one (II-10) and 1-methyl-4-[3-methyl-2-[[1-[3-(trifluoromethyl)phenyl]-ethylideneamino]oxymethyl]phenyl]tetrazol-5-one (II-11).

- 5 2. The mixture according to claim 1, comprising a compound of formula I and a pesticide II in a synergistically effective amount.
3. The mixture according to claim 1 or 2, comprising a compound of formula I and a pesticide
10 II in a weight ratio of from 100:1 to 1:100.
4. The mixture according to any of the claims 1 to 3, wherein component 1) 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-difluorophenyl)pyrazol-3-yl]oxy-2-methoxyimino-N,3-dimethyl-
15 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-fluoro-phenyl)pyrazol-3-yl]oxy-2-methoxyimino-N,3-dimethyl-pent-3-enamide, (Z,2E)-2-methoxyimino-N,3-
20 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-
25 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.
35
5. The mixture according to claim 4, wherein component 1) 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.
40
6. The mixture according to claim 5, wherein component 1) is selected from (Z,2E)-5-[1-(4-chlorophenyl)pyrazol-3-yl]oxy-2-methoxyimino-N,3-dimethyl-pent-3-enamide and (Z,2E)-5-[1-(2,4-dichlorophenyl)pyrazol-3-yl]oxy-2-methoxyimino-N,3-dimethyl-

pent-3-enamide.

7. The mixture according to any of the claims 1 to 6, wherein component 2) is selected from
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, 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-tetra-
zol-5-one and 1-methyl-4-[3-methyl-2-[[1-[3-(trifluoromethyl)phenyl]-ethylideneamino]-
oxymethyl]phenyl]tetrazol-5-one.
8. The mixture according to claim 7, comprising component 1) and component 2) in a weight
ratio of from 20:1 to 1:20.
9. The mixture according to any of claims 1 to 8, comprising in addition a further pesticide III
as component 3).
10. The mixture according to claim 9, comprising a compound I and a pesticide II in a weight
ratio of from 100:1 to 1:100, and a compound I and pesticide III in a weight ratio of from
100:1 to 1:100.
11. An agrochemical composition, comprising a solvent or solid carrier and a mixture
according to any of claims 1 to 10.
12. The composition according to claim 11 further comprising seed in an amount of from 1 g
to 1000 g active components per 100 kg of seed.
13. Use of the mixture as defined in any of the claims 1 to 10 or of the composition as defined
in claim 11 for controlling phytopathogenic harmful fungi.
14. 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 mixture as defined in any one of claims 1 to 10 or of the
composition as defined in claim 11.
15. Plant propagation material coated with the mixture as defined in any of the claims 1 to 10
or with the composition as defined in claim 11.

INTERNATIONAL SEARCH REPORT

International application No PCT/EP2016/054367

A. CLASSIFICATION OF SUBJECT MATTER INV. A01P3/00 A01N43/56 A01N43/713 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, 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.		
A	WO 2014/202421 A (BASF SE) 24 December 2014 (2014-12-24) the whole document -----	1-15		
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.				
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12 April 2016	21/04/2016			
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2014202421 A	24-12-2014	CA 2914411 A1	24-12-2014
		CN 105307497 A	03-02-2016
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