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(54) Titre : COMPOSITIONS PESTICIDES COMPRENANT UN COMPOSE DE TRIAZOLE  
 (54) Title: PESTICIDAL COMPOSITIONS COMPRISING A TRIAZOLE COMPOUND

(57) Abrégé/Abstract:

The present invention relates to compositions comprising, 1) as component I a compound selected from compounds I-1 to I-31, and 2) as component II a compound of formula II, and uses and methods for combatting harmful pests using the inventive compositions, such as phytopathogenic fungi and/or for the control of insects, acarids or nematodes. Furthermore, the present invention provides methods for improving the health of a plant using the inventive compositions.

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## (54) Title: PESTICIDAL COMPOSITIONS COMPRISING A TRIAZOLE COMPOUND

(57) Abstract: The present invention relates to compositions comprising, 1) as component I a compound selected from compounds I-1 to I-31, and 2) as component II a compound of formula II, and uses and methods for combatting harmful pests using the inventive compositions, such as phytopathogenic fungi and/or for the control of insects, acarids or nematodes. Furthermore, the present invention provides methods for improving the health of a plant using the inventive compositions.



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Pesticidal compositions comprising a triazole compound

Description

5 The present invention relates to pesticidal compositions and uses and methods for combatting harmful pests using the inventive compositions, such as phythopathogenic fungi and/or for the control of insects, acarids or nematodes. Furthermore, the present invention provides methods for improving the health of a plant using the inventive compositions.

10 With a view to reducing the application rates and broadening the activity spectrum of known compounds, it was an object of the present invention to provide compositions which, at a reduced total amount of active compounds applied, show improved activity against important harmful fungi, in particular for certain indications. It was a further object to provide for compositions that are useful for the control of specific pathogens in specific important crops that are often susceptible to the attack of pathogens.

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

Another problem encountered concerns the need to have available pest control agents which are effective against a broad spectrum of pests. There also exists the need for pest control agents that combine knock-down activity with prolonged control, that is, fast action with long lasting action.

20 Another difficulty in relation to the use of pesticides is that the repeated and exclusive application of an individual pesticidal compound leads in many cases to a rapid selection of pests which have developed natural or adapted resistance against the active compound in question. Therefore there is a need for pest control agents that help prevent or overcome resistance induced by pesticides.

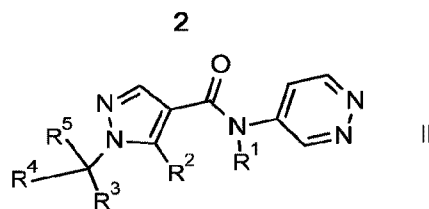
25 Furthermore, there is a desire for pesticide compounds or combination of compounds, which when applied improve plants, which may result in "plant health", "vitality of plant propagation material" or "increased plant yield".

30 It is therefore an object of the present invention to provide agricultural combinations which solves one or more than one of the discussed problems. It has been found that this object is in part or in whole achieved by the combination of active compounds defined below.

According to the first aspect, the present invention relates to pesticidal compositions comprising,

35 1) as component I a compound selected from the group consisting of the compounds I-1, I-2, I-3, I-4, I-5, I-6, I-7, I-8, I-9, I-10, I-11, I-12, I-13, I-14, I-15, I-16, I-17, I-18, I-19, I-20, I-21, I-22, I-23, I-24, I-25, I-26, I-27, I-28, I-29, I-30 and I-31, or the N-oxides or the agriculturally acceptable salts of each of the compounds; and

2) as component II a compound of formula II:



wherein

R<sup>1</sup> is H, C<sub>1</sub>-C<sub>2</sub>-alkyl, or C<sub>1</sub>-C<sub>2</sub>-alkoxy-C<sub>1</sub>-C<sub>2</sub>-alkyl;

R<sup>2</sup> is CH<sub>3</sub>, or halomethyl;

- 5 R<sup>3</sup> is CN, C<sub>1</sub>-C<sub>6</sub>-alkyl, C<sub>1</sub>-C<sub>6</sub>-haloalkyl, C<sub>1</sub>-C<sub>2</sub>-alkoxy-C<sub>1</sub>-C<sub>2</sub>-alkyl, C<sub>2</sub>-C<sub>6</sub>-alkenyl and C<sub>2</sub>-C<sub>6</sub>-alkynyl, C<sub>3</sub>-C<sub>6</sub>-cycloalkyl, C<sub>5</sub>-C<sub>6</sub>-cycloalkenyl, C<sub>1</sub>-C<sub>6</sub>-alkoxy, wherein the C-atoms are unsubstituted, or partially or fully substituted by R<sup>a</sup>;

R<sup>a</sup> is halogen, CN, C<sub>1</sub>-C<sub>2</sub>-alkyl, C<sub>1</sub>-C<sub>2</sub>-haloalkyl, C<sub>1</sub>-C<sub>4</sub>-alkoxy, C<sub>1</sub>-C<sub>2</sub>-haloalkoxy;

- 10 R<sup>4</sup> is C<sub>1</sub>-C<sub>4</sub>-alkyl, or a group mentioned for R<sup>3</sup>; or

R<sup>3</sup> and R<sup>4</sup> may together form C<sub>5</sub>-C<sub>6</sub>-cycloalkyl, which is unsubstituted, or partially or fully substituted by R<sup>a</sup>;

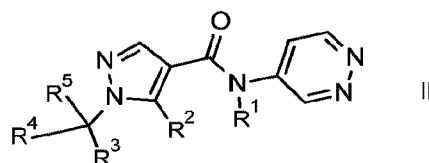
R<sup>5</sup> is H, or a group mentioned for R<sup>4</sup>;

and the stereoisomers, salts, tautomers and N-oxides thereof.

- 15 The present invention relates, according to the second aspect, to compositions comprising,

1) as component I a compound selected from the group consisting of the compounds I-1, I-2, I-3, I-4, I-5, I-6, I-7, I-8, I-9, I-10, I-11, I-12, I-13, I-14, I-15, I-16, I-17, I-18, I-19, I-20, I-21, I-22, I-23, I-24, I-25, I-26, I-27, I-28, I-29, I-30 and I-31, or the N-oxides or the agriculturally acceptable salts of each of the compounds;

- 20 2) as component II a compound of formula II:



wherein

R<sup>1</sup> is H, C<sub>1</sub>-C<sub>2</sub>-alkyl, or C<sub>1</sub>-C<sub>2</sub>-alkoxy-C<sub>1</sub>-C<sub>2</sub>-alkyl;

R<sup>2</sup> is CH<sub>3</sub>, or halomethyl;

- 25 R<sup>3</sup> is CN, C<sub>1</sub>-C<sub>6</sub>-alkyl, C<sub>1</sub>-C<sub>6</sub>-haloalkyl, C<sub>1</sub>-C<sub>2</sub>-alkoxy-C<sub>1</sub>-C<sub>2</sub>-alkyl, C<sub>2</sub>-C<sub>6</sub>-alkenyl and C<sub>2</sub>-C<sub>6</sub>-alkynyl, C<sub>3</sub>-C<sub>6</sub>-cycloalkyl, C<sub>5</sub>-C<sub>6</sub>-cycloalkenyl, C<sub>1</sub>-C<sub>6</sub>-alkoxy, wherein the C-atoms are unsubstituted, or partially or fully substituted by R<sup>a</sup>;

R<sup>a</sup> is halogen, CN, C<sub>1</sub>-C<sub>2</sub>-alkyl, C<sub>1</sub>-C<sub>2</sub>-haloalkyl, C<sub>1</sub>-C<sub>4</sub>-alkoxy, C<sub>1</sub>-C<sub>2</sub>-haloalkoxy;

- 30 R<sup>4</sup> is C<sub>1</sub>-C<sub>4</sub>-alkyl, or a group mentioned for R<sup>3</sup>; or

R<sup>3</sup> and R<sup>4</sup> may together form C<sub>5</sub>-C<sub>6</sub>-cycloalkyl, which is unsubstituted, or partially or fully substituted by R<sup>a</sup>;

R<sup>5</sup> is H, or a group mentioned for R<sup>4</sup>;

and the stereoisomers, salts, tautomers and N-oxides thereof; and

- 5 3) as component III a compound selected from the group consisting of the compounds  
 Azoxystrobin (F-1), Trifloxystrobin (F-2), Picoxystrobin (F-3), Pyraclostrobin (F-4), Sedaxane (F-  
 5) Penthiopyrad (F-6), Penflufen (F-7), Fluopyram (F-8), Fluxapyroxad (F-9), Boscalid (F-10),  
 Oxathiapiprolin (F-11), Metalaxyl (F-12), Metalaxyl-M (F-13), Ethaboxam (F-14), dimethomorph  
 10 (F-15), Valifenalate (F-16), Cyproconazole (F-17), Difenoconazole (F-18), Prothioconazole (F-  
 19), Flutriafol (F-20), Thiabendazole (F-21), Ipconazole (F-22), Tebuconazole (F-23), Triadime-  
 nol (F-24), Prochloraz (F-25), Fluquinconazole (F-26), Triticonazole (F-27), Fludioxinil (F-28),  
 Carboxin (F-29), Silthiofarm (F-30), Ziram (F-31), Thiram (F-32), Carbendazim (F-33), Thiopha-  
 nate-methyl (F-34), Fluazinam (F-35), Fenamidon (F-36), Fipronil (In-1), 3-[(methylamino)-N-[2-  
 bromo-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]-6-(trifluoromethyl)phenyl]-2-fluoro-  
 15 benzamide (In-2), 3-(benzoylmethylamino)-N-[2-bromo-4-[1,2,2,3,3,3-hexafluoro-1-  
 (trifluoromethyl)propyl]-6-(trifluoromethyl)phenyl]-2-fluoro-benzamide (In-3), 3-  
 (benzoylmethylamino)-2-fluoro-N-[2-iodo-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]-6-  
 (trifluoromethyl)phenyl]-benzamide (In-4), N-[3-[[[2-iodo-4-[1,2,2,2-tetrafluoro-1-  
 (trifluoromethyl)ethyl]-6-(trifluoromethyl)phenyl]amino]carbonyl]phenyl]-N-methyl-benzamide (In-  
 20 5), N-[3-[[[2-bromo-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]-6-  
 (trifluoromethyl)phenyl]amino]carbonyl]-2-fluorophenyl]-4-fluoro-N-methyl-benzamide (In-6), 4-  
 fluoro-N-[2-fluoro-3-[[[2-iodo-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]-6-(trifluoromethyl)-  
 phenyl]amino]carbonyl]phenyl]-N-methyl-benzamide (In-7), 3-fluoro-N-[2-fluoro-3-[[[2-iodo-4-  
 25 [1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]-6-(trifluoromethyl)phenyl]amino]carbonyl]phenyl]-N-  
 methyl-benzamide (In-8), 2-chloro-N-[3-[[[2-iodo-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]-6-  
 (trifluoromethyl)phenyl]amino]carbonyl]phenyl]-3-pyridinecarboxamide (In-9), N-[4,6-dichloro-2-  
 [(diethyl-lambda-4-sulfanylidene)carbamoyl]-phenyl]-2-(3-chloro-2-pyridyl)-5-(trifluoromethyl)-  
 pyrazole-3-carboxamide (In-10), N-[4-chloro-2-[(diethyl-lambda-4-sulfanylidene)carbamoyl]-6-  
 methyl-phenyl]-2-(3-chloro-2-pyridyl)-5-(trifluoromethyl)pyrazole-3-carboxamide (In-11), N-[4-  
 30 chloro-2-[(di-2-propyl-lambda-4-sulfanylidene)carbamoyl]-6-methyl-phenyl]-2-(3-chloro-2-  
 pyridyl)-5-(trifluoromethyl)pyrazole-3-carboxamide (In-12), N-[4,6-dichloro-2-[(di-2-propyl-  
 lambda-4-sulfanylidene)carbamoyl]-phenyl]-2-(3-chloro-2-pyridyl)-5-(trifluoromethyl)pyrazole-3-  
 carboxamide (In-13), N-[4,6-dibromo-2-[(diethyl-lambda-4-sulfanylidene)carbamoyl]-phenyl]-2-  
 (3-chloro-2-pyridyl)-5-(trifluoromethyl)pyrazole-3-carboxamide (In-14), Clothianidin (In-15),  
 35 Thiamethoxam (In-16), Acetamiprid (In-17), Dinotefuran (In-18), Imidacloprid (In-19), Thiocloprid  
 (In-20), Flupyradifurone (In-21), Sulfoxaflor (In-22), Methiocarb (In-23), Tefluthrin (In-24),  
 Bifenthrin (In-25), Cypermethrin (In-26), Alphacypermethrin (In-27), Spinosad (In-28), Cyazapyr  
 (In-29), Rynaxapyr (In-30), Thiodicarb (In-31), Triflumezopyrim (Mesoionic) (In-32), Acephate  
 (In-33), Chlorpyrifos (In-34), Abamectin (In-35) and Tioxazafen (In-36), or the N-oxides or the  
 40 agriculturally acceptable salts of each of the compounds.

In the following, the components I, II and III used in the inventive compositions are further detailed and preferences and embodiments are outlined. Any of the embodiments and

preferences given for a particular component can also be combined with any of the embodiments and preferences given for one or more further component/s of the inventive compositions.

The components I can be obtained by various routes in analogy to prior art processes known (cf. J.Agric. Food Chem. (2009) 57, 4854-4860; EP 0 275 955 A1; DE 40 03 180 A1; EP 0 113 640 A2; EP 0 126 430 A2). Furthermore, the components I, their preparation and use in crop protection are described in WO 2013/007767 (PCT/EP2012/063626), WO 2013/024076 (PCT/EP2012/065835), WO 2013/024075 (PCT/EP2012/065834), , WO 2013/024077 (PCT/EP2012/065836), WO 2013/024081 (PCT/EP2012/065848), WO 2013/024080 (PCT/EP2012/065847), WO 2013/024083 (PCT/EP2012/065852) WO 2013/010862 (PCT/EP2012/063526), WO 2013/010894 (PCT/EP2012/063635), WO 2013/010885 (PCT/EP2012/063620), WO 2013/024082 (PCT/EP2012/065850), which also disclose certain compositions with other active compounds. Owing to the basic character of their nitrogen atoms, compounds I-1, I-2, I-3, I-4, I-5, I-6, I-7, I-8, I-9, I-10, I-11, I-12, I-13, I-14, I-15, I-16, I-17, I-18, I-19, I-20, I-21, I-22, I-23, I-24, I-25, I-26, I-27, I-28, I-29, I-30 and I-31, is capable of forming salts or adducts with inorganic or organic acids or with metal ions, in particular salts with inorganic acids or N-oxides.

Compounds I-1 to I-31 used as component I in the inventive compositions are the following fungicidal compounds:

- |    |               |   |
|----|---------------|---|
| 20 | compound I-1  | 2-[2-chloro-4-(4-chlorophenoxy)phenyl]-1-(1,2,4-triazol-1-yl)pent-3-yn-2-ol;                        |
|    | compound I-2  | 1-[2-chloro-4-(4-chlorophenoxy)phenyl]-1-cyclopropyl-2-(1,2,4-triazol-1-yl)ethanol;                 |
|    | compound I-3  | 2-[4-(4-chlorophenoxy)-2-(trifluoromethyl)phenyl]-1-(1,2,4-triazol-1-yl)propan-2-ol;                |
| 25 | compound I-4  | 1-[4-(4-chlorophenoxy)-2-(trifluoromethyl)phenyl]-1-cyclopropyl-2-(1,2,4-triazol-1-yl)ethanol;      |
|    | compound I-5  | 2-[4-(4-chlorophenoxy)-2-(trifluoromethyl)phenyl]-3-methyl-1-(1,2,4-triazol-1-yl)butan-2-ol;        |
|    | compound I-6  | 1-[2-[2-chloro-4-(4-chlorophenoxy)phenyl]-2-methoxy-pent-3-ynyl]-1,2,4-triazole;                    |
| 30 | compound I-7  | 2-[4-(4-chlorophenoxy)-2-(trifluoromethyl)phenyl]-1-(1,2,4-triazol-1-yl)butan-2-ol;                 |
|    | compound I-8  | 1-[2-[2-chloro-4-(4-chlorophenoxy)phenyl]-2-cyclopropyl-2-methoxy-ethyl]-1,2,4-triazole;            |
|    | compound I-9  | 1-[2-[4-(4-chlorophenoxy)-2-(trifluoromethyl)phenyl]-2-methoxy-propyl]-1,2,4-triazole;              |
| 35 | compound I-10 | 2-[2-chloro-4-(4-chlorophenoxy)phenyl]-3,3-dimethyl-1-(1,2,4-triazol-1-yl)butan-2-ol,               |
|    | compound I-11 | 1-[2-[4-(4-chlorophenoxy)-2-(trifluoromethyl)phenyl]-2-cyclopropyl-2-methoxy-ethyl]-1,2,4-triazole; |
| 40 | compound I-12 | 2-[2-trifluoromethyl-4-(4-chlorophenoxy)phenyl]-1-methoxy-3-(1,2,4-triazol-1-yl)propan-2-ol;        |
|    | compound I-13 | 1-[2-[4-(4-chlorophenoxy)-2-(trifluoromethyl)phenyl]-2-methoxy-butyl]-1,2,4-triazole;               |

## 5

- compound I-14 2-[4-(4-chlorophenoxy)-2-(trifluoromethyl)phenyl]-1-(1,2,4-triazol-1-yl)pent-3-yn-2-ol;
- compound I-15 1-[2-[4-(4-chlorophenoxy)-2-(trifluoromethyl)phenyl]-2-methoxy-pent-3-ynyl]-1,2,4-triazole;
- 5 compound I-16 2-[4-(4-chlorophenoxy)-2-(trifluoromethyl)phenyl]-1-(1,2,4-triazol-1-yl)but-3-yn-2-ol;
- compound I-17 2-[2-chloro-4-(4-chlorophenoxy)phenyl]-1-(1,2,4-triazol-1-yl)propan-2-ol;
- compound I-18 2-[2-chloro-4-(4-fluorophenoxy)phenyl]-1-(1,2,4-triazol-1-yl)propan-2-ol;
- 10 compound I-19 2-[2-chloro-4-(4-chlorophenoxy)phenyl]-3-methyl-1-(1,2,4-triazol-1-yl)butan-2-ol;
- compound I-20 1-[2-[2-chloro-4-(4-chlorophenoxy)phenyl]-2-methoxy-propyl]-1,2,4-triazole;
- compound I-21 1-[2-[2-chloro-4-(4-chlorophenoxy)phenyl]-2-methoxy-butyl]-1,2,4-triazole;
- compound I-22 1-[2-[2-chloro-4-(4-chlorophenoxy)phenyl]-2-methoxy-pentyl]-1,2,4-triazole;
- 15 compound I-23 2-[2-chloro-4-(4-chlorophenoxy)phenyl]-1,1,1-trifluoro-3-(1,2,4-triazol-1-yl)propan-2-ol;
- compound I-24 2-[2-chloro-4-(4-chlorophenoxy)phenyl]-3-fluoro-1-(1,2,4-triazol-1-yl)butan-2-ol hydrochloride;
- compound I-25 2-[2-chloro-4-(4-chlorophenoxy)phenyl]-1-(1,2,4-triazol-1-yl)pent-4-yn-2-ol;
- 20 compound I-26 2-[2-chloro-4-(4-chlorophenoxy)phenyl]-1-methoxy-3-(1,2,4-triazol-1-yl)propan-2-ol;
- compound I-27 2-[2-chloro-4-(4-fluorophenoxy)phenyl]-1-methoxy-3-(1,2,4-triazol-1-yl)propan-2-ol;
- compound I-28 2-[4-(4-chlorophenoxy)-2-(trifluoromethyl)phenyl]-1-(1,2,4-triazol-1-yl)pentan-2-ol;
- 25 compound I-29 2-[4-(4-fluorophenoxy)-2-(trifluoromethyl)phenyl]-1-(1,2,4-triazol-1-yl)propan-2-ol;
- compound I-30 2-[2-chloro-4-(4-chlorophenoxy)phenyl]-1-(1,2,4-triazol-1-yl)butan-2-ol; and
- compound I-31 2-[2-chloro-4-(4-chlorophenoxy)phenyl]-1-(1,2,4-triazol-1-yl)pentan-2-ol.

30 In each case, the respective N-oxide and the agriculturally acceptable salts of the compounds as further defined below are encompassed. Compounds I-1 to I-31 comprise chiral centers and they are generally obtained in the form of racemates. The R- and S-enantiomers of the compounds contained as component I in the compositions according to the invention can be separated and isolated in pure form with methods known by the skilled person, e.g. by using chiral HPLC. Suitable for use in the compositions are both the enantiomers and compositions thereof. Furthermore, said components I can be present in different crystal modifications, which may differ in biological activity.

40 In particular, in each case, a racemic composition of the respective components I, namely of compound I-1, I-2, I-3, I-4, I-5, I-6, I-7, I-8, I-9, I-10, I-11, I-12, I-13, I-14, I-15, I-16, I-17, I-18, I-19, I-20, I-21, I-22, I-23, I-24, I-25, I-26, I-27, I-28, I-29, I-30 or I-31, respectively, is present. Furthermore, any other proportions of the (R)-enantiomer and the (S)-enantiomer of the respective compound I-1, I-2, I-3, I-4, I-5, I-6, I-7, I-8, I-9, I-10, I-11, I-12, I-13, I-14, I-15, I-16, I-17, I-18, I-19, I-20, I-21, I-22, I-23, I-24, I-25, I-26, I-27, I-28, I-29, I-30 or I-31, respectively, may be present according to the present invention. For example, the (R)-enantiomer of compound I-

## 6

3 is (R)-2-[4-(4-chlorophenoxy)-2-(trifluoromethyl)phenyl]-1-(1,2,4-triazol-1-yl)propan-2-ol; the S-enantiomer of I-3 is (S)-2-[4-(4-chlorophenoxy)-2-(trifluoromethyl)phenyl]-1-(1,2,4-triazol-1-yl)propan-2-ol. This applies to the other compounds accordingly.

5 According to one specific embodiment, the respective compound I-1, I-2, I-3, I-4, I-5, I-6, I-7, I-8, I-9, I-10, I-11, I-12, I-13, I-14, I-15, I-16, I-17, I-18, I-19, I-20, I-21, I-22, I-23, I-24, I-25, I-26, I-27, I-28, I-29, I-30 or I-31, respectively, is provided and used as (R)-enantiomer with an enantiomeric excess (e.e.) of at least 40%, for example, at least 50%, 60%, 70% or 80%, preferably at least 90%, more preferably at least 95%, yet more preferably at least 98% and most preferably at least 99%. According to a further specific embodiment, the respective  
10 compound I-1, I-2, I-3, I-4, I-5, I-6, I-7, I-8, I-9, I-10, I-11, I-12, I-13, I-14, I-15, I-16, I-17, I-18, I-19, I-20, I-21, I-22, I-23, I-24, I-25, I-26, I-27, I-28, I-29, I-30 or I-31, respectively, is provided and used as (S)-enantiomer with an enantiomeric excess (e.e.) of at least 40%, for example, at least 50%, 60%, 70% or 80%, preferably at least 90%, more preferably at least 95%, yet more preferably at least 98% and most preferably at least 99%.

15 This applies to every composition detailed herein.

According to one embodiment of the invention, component I is compound I-1.

According to a further embodiment of the invention, component I is compound I-2.

According to a further embodiment of the invention, component I is compound I-3.

According to still a further embodiment of the invention, component I is compound I-4.

20 According to still a further embodiment of the invention, component I is compound I-5.

According to still a further embodiment of the invention, component I is compound I-6.

According to still a further embodiment of the invention, component I is compound I-7.

According to still a further embodiment of the invention, component I is compound I-8.

According to still a further embodiment of the invention, component I is compound I-9.

25 According to still a further embodiment of the invention, component I is compound I-10.

According to still a further embodiment of the invention, component I is compound I-11.

According to still a further embodiment of the invention, component I is compound I-12.

According to still a further embodiment of the invention, component I is compound I-13.

According to still a further embodiment of the invention, component I is compound I-14.

30 According to still a further embodiment of the invention, component I is compound I-15.

According to still a further embodiment of the invention, component I is compound I-16.

According to one further embodiment of the invention, component I is compound I-17.

According to still a further embodiment of the invention, component I is compound I-18.

According to still a further embodiment of the invention, component I is compound I-19.

35 According to still a further embodiment of the invention, component I is compound I-20.

According to still a further embodiment of the invention, component I is compound I-21.

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According to still a further embodiment of the invention, component I is compound I-22.

According to still a further embodiment of the invention, component I is compound I-23.

According to still a further embodiment of the invention, component I is compound I-24.

According to still a further embodiment of the invention, component I is compound I-25.

5 According to still a further embodiment of the invention, component I is compound I-26.

According to still a further embodiment of the invention, component I is compound I-27.

According to still a further embodiment of the invention, component I is compound I-28.

According to still a further embodiment of the invention, component I is compound I-29.

According to still a further embodiment of the invention, component I is compound I-30.

10 According to still a further embodiment of the invention, component I is compound I-31.

According to one further embodiment of the present invention, component I is selected from compounds I-1, I-2, I-3, I-4, I-5, I-6, I-7, I-8, I-9, I-11, I-13, I-14, I-15 and I-16. According to a more particular embodiment of the present invention, component I is selected from compounds I-1, I-2, I-6 and I-8. According to another more particular embodiment of the present invention,

15 component I is selected from compounds I-3, I-4, I-5, I-7, I-9, I-11, I-13, I-14, I-15 and I-16.

According to still a further embodiment of the present invention, component I is selected from compounds I-1, I-2, I-3, I-4, I-5 and I-13, more specifically selected from compounds I-1, I-2, I-3, I-4 and I-5. According to still a further embodiment of the present invention, component I is selected from compounds I-1, I-4 and I-13. According to still a further embodiment of the

20 present invention, component I is selected from compounds I-3 and I-5.

According to a further embodiment of the present invention, component I is selected from compounds I-17, I-18, I-19, I-20, I-21, I-22, I-23, I-24, I-25, I-26, I-27, I-28, I-29, I-30 and I-31.

The preparation of the compounds of formula II is described in WO2010/034737,

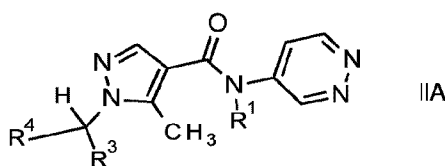
WO2012/084670, WO2012/143317, and WO2015/055497. The term "stereoisomers" with

25 respect to compounds of formula II encompasses both optical isomers, such as enantiomers or diastereomers, the latter existing due to more than one center of chirality in the molecule, as well as geometrical isomers (cis/trans isomers).

The compounds of the formula II may be amorphous or may exist in one or more different crystalline states (polymorphs) which may have a different macroscopic properties such as stability or show different biological properties such as activities. The present invention includes

30 both amorphous and crystalline compounds of the formula I, mixtures of different crystalline states of the respective compound I, as well as amorphous or crystalline salts thereof.

In one embodiment, the compound of formula II is a compound of formula IIA as depicted below, wherein R<sup>2</sup> is CH<sub>3</sub> and R<sup>5</sup> is H.



For the compounds of formula IIA, it is particularly preferred that R<sup>1</sup> is H, CH<sub>3</sub>, C<sub>2</sub>H<sub>5</sub>, or CH<sub>2</sub>OCH<sub>3</sub>.

- Furthermore, it is preferred for the compounds of formula IIA that R<sup>3</sup> is CH<sub>3</sub>, C<sub>2</sub>H<sub>5</sub>, CH(CH<sub>3</sub>)<sub>2</sub>, CH<sub>2</sub>CH<sub>2</sub>CH<sub>3</sub>, CF<sub>3</sub>, CHFCH<sub>3</sub>, cyclopropyl, wherein the ring is substituted by halogen, or CN, and that R<sup>4</sup> is C<sub>1</sub>-C<sub>4</sub>-alkyl, or that R<sup>3</sup> and R<sup>4</sup> together form C<sub>5</sub>-C<sub>6</sub>-cycloalkyl, which is unsubstituted, or partially or fully substituted by halogen, or CN.

Particularly preferred compounds of formula II are compounds of formula IIA, wherein the variables R<sup>1</sup>, R<sup>3</sup>, and R<sup>4</sup> correspond to one row of table II below. Said compounds are referred to as compounds II-1 to II-18 in accordance with each row of table II.

10 Table II

No	R <sup>1</sup>	R <sup>3</sup>	R <sup>4</sup>
II-1	CH <sub>3</sub>	CH <sub>3</sub>	CH <sub>3</sub>
II-2	CH <sub>2</sub> CH <sub>3</sub>	CH(CH <sub>3</sub> ) <sub>2</sub>	CH <sub>3</sub>
II-3	CH <sub>3</sub>	CF <sub>3</sub>	CH <sub>3</sub>
II-4	CH <sub>2</sub> CH <sub>3</sub>	1-CN-c-C <sub>3</sub> H <sub>4</sub>	CH <sub>3</sub>
II-5	CH <sub>2</sub> CH <sub>3</sub>	CHFCH <sub>3</sub>	CH <sub>3</sub>
II-6	CH <sub>3</sub>	CH(CH <sub>3</sub> ) <sub>2</sub>	CH <sub>3</sub>
II-7	CH <sub>3</sub>	1-CN-c-C <sub>3</sub> H <sub>4</sub>	CH <sub>3</sub>
II-8	CH <sub>3</sub>	CHFCH <sub>3</sub>	CH <sub>3</sub>
II-9	CH <sub>2</sub> CH <sub>3</sub>	CH <sub>2</sub> CH <sub>2</sub> CF <sub>2</sub> CH <sub>2</sub> CH <sub>2</sub>	
II-10	CH <sub>3</sub>	CH <sub>2</sub> CH <sub>2</sub> CF <sub>2</sub> CH <sub>2</sub> CH <sub>2</sub>	
II-11	CH <sub>2</sub> CH <sub>3</sub>	CH <sub>3</sub>	CH <sub>3</sub>
II-12	CH <sub>2</sub> CH <sub>3</sub>	CF <sub>3</sub>	CH <sub>3</sub>
II-13	CH <sub>2</sub> OCH <sub>3</sub>	CH <sub>3</sub>	CH <sub>3</sub>
II-14	CH <sub>2</sub> OCH <sub>3</sub>	CF <sub>3</sub>	CH <sub>3</sub>
II-15	CH <sub>2</sub> OCH <sub>3</sub>	CH(CH <sub>3</sub> ) <sub>2</sub>	CH <sub>3</sub>
II-16	CH <sub>2</sub> OCH <sub>3</sub>	1-CN-c-C <sub>3</sub> H <sub>4</sub>	CH <sub>3</sub>
II-17	CH <sub>2</sub> OCH <sub>3</sub>	CHFCH <sub>3</sub>	CH <sub>3</sub>
II-18	CH <sub>2</sub> OCH <sub>3</sub>	CH <sub>2</sub> CH <sub>2</sub> CF <sub>2</sub> CH <sub>2</sub> CH <sub>2</sub>	

With regard to the compounds II-2, II-3, II-4, II-5, II-6, II-7, II-8, II-12, II-14, II-15, II-16, II-17, it is to be understood, as explained above, that the compounds may be present in two enantiomeric forms, which are all understood to be encompassed by the present invention, either in isolated form or as a mixture.

- 15 The pesticides III, described by their common names, their preparation and their biological activity e. g. against harmful fungi, pests or weed is known; these substances are commercially available and known, for example, from the references below:
- azoxystrobin, methyl 2-{2-[6-(2-cyano-1-vinylpenta-1,3-dienyloxy)pyrimidin-4-yloxy]phenyl}-3-methoxyacrylate (EP 382 375); trifloxystrobin, methyl (E)-methoxyimino-  
 20 {(E)- $\alpha$ -[1-( $\alpha, \alpha, \alpha$ -trifluoro-m-tolyl)ethylideneaminoxy]-o-tolyl}acetate (EP 460 575); picoxystrobin, methyl 3-methoxy-2-[2-(6-trifluoromethylpyridin-2-yloxymethyl)phenyl]-acrylate (EP 278 595); pyraclostrobin, methyl *N*-{2-[1-(4-chlorophenyl)-1H-pyrazol-3-yloxymethyl]phenyl}(*N*-methoxy)carbamate (WO 96/01256); penthiopyrad, (RS)-*N*-[2-(1,3-dimethylbutyl)-3-thienyl]-1-methyl-3-(trifluoromethyl)-1H-pyrazole-4-carboxamide (JP  
 25 10130268); boscalid, 2-chloro-*N*-(4-chlorobiphenyl-2-yl)nicotinamide (EP-A 545 099); metaxyl, methyl *N*-(methoxyacetyl)-*N*-(2,6-xylyl)-DL-alaninate (GB 15 00 581); ethaboxam, *N*-(cyano-2-thienylmethyl)-4-ethyl-2-(ethylamino)-5-thiazolecarboxamide (EP-A 639 574); dimethomorph, 3-(4-chlorophenyl)-3-(3,4-dimethoxyphenyl)-1-morpholin-4-yl-propenone (EP 120 321); cyproconazole, 2-(4-chlorophenyl)-3-cyclopropyl-1-[1,2,4]triazol-1-ylbutan-2-  
 30 ol (US 4 664 696); difenoconazole, 1-{2-[2-chloro-4-(4-chlorophenoxy)phenyl]-4-methyl-[1,3]dioxolan-2-ylmethyl}-1H-[1,2,4]triazole (GB-A 2 098 607); prothioconazole, 2-[2-(1-chlorocyclopropyl)-3-(2-chlorophenyl)-2-hydroxy-

propyl]-2,4-dihydro-[1,2,4]triazole-3-thione (WO 96/16048); flutriafol,  $\alpha$ -(2-fluorophenyl)- $\alpha$ -(4-fluorophenyl)-1H-1,2,4-triazole-1-ethanol (EP 15 756); thiabendazole, 2-(1,3-thiazol-4-yl)benzimidazole (US 3 017 415); ipconazole, 2-[(4-chlorophenyl)methyl]-5-(1-methylethyl)-1-(1H-1,2,4-triazol-1-ylmethyl)cyclopentanol (EP 267 778); tebuconazole, 1-(4-chlorophenyl)-4,4-dimethyl-3-[1,2,4]triazol-1-ylmethylpentan-3-ol (EP-A 40 345); triadimenol,  $\beta$ -(4-chlorophenoxy)- $\alpha$ -(1,1-dimethylethyl)-1H-1,2,4-triazole-1-ethanol (DE 23 24 010); prochloraz, *N*-(propyl-[2-(2,4,6-trichlorophenoxy)ethyl])imidazole-1-carboxamide (US 3 991 071); fluquinconazole, 3-(2,4-dichlorophenyl)-6-fluoro-2-[1,2,4]-triazol-1-yl-3H-quinazolin-4-one (Proc. Br. Crop Prot. Conf.-Pests Dis., 5-3, 411 (1992)); triticonazole, (5E)-5-[(4-chlorophenyl)methylene]-2,2-dimethyl-1-(1H-1,2,4-triazol-1-ylmethyl)cyclopentanol (FR 26 41 277); fludioxonil, 4-(2,2-difluorobenzo[1,3]dioxol-4-yl)-1H-pyrrole-3-carbonitrile (The Pesticide Manual, publ. The British Crop Protection Council, 10th ed. (1995), p. 482); carboxin, 5,6-dihydro-2-methyl-*N*-phenyl-1,4-oxathiin-3-carboxamide (US 3 249 499); silthiofam, *N*-allyl-4,5-dimethyl-2-(trimethylsilyl)thiophene-3-carboxamide [CAS RN 175217-20-6]; ziram, thiram, bis(dimethylthiocarbamoyl) disulfide (DE 642 532); carbendazim, methyl (1H-benzoimidazol-2-yl)carbamate (US 3 657 443); thiophanate-methyl, 1,2-phenylenebis(iminocarbonothioyl)bis(dimethylcarbamate) (DE-A 19 30 540). Compound In-2 is disclosed in WO 2010/018714, the preparation is described in EP 2322502. Compounds In-10 to In-14 can be prepared as described in WO 2007/006670, WO2013/024009 and WO2013/024010. The abbreviations for the compounds used as components III, respectively, are as follows:

Insecticides:

- In-1 Fipronil
- In-2 3-[benzoyl(methyl)amino]-N-[2-bromo-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]-6-(trifluoromethyl)phenyl]-2-fluoro-benzamide
- 25 In-3 3-(benzoylmethylamino)-N-[2-bromo-4-[1,2,2,3,3,3-hexafluoro-1-(trifluoromethyl)propyl]-6-(trifluoromethyl)phenyl]-2-fluoro-benzamide
- In-4 3-(benzoylmethylamino)-2-fluoro-N-[2-iodo-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]-6-(trifluoromethyl)phenyl]-benzamide
- In-5 N-[3-[[[2-iodo-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]-6-(trifluoromethyl)phenyl]amino]carbonyl]phenyl]-N-methyl-benzamide
- 30 In-6 N-[3-[[[2-bromo-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]-6-(trifluoromethyl)phenyl]amino]carbonyl]-2-fluorophenyl]-4-fluoro-N-methyl-benzamide
- In-7 4-fluoro-N-[2-fluoro-3-[[[2-iodo-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]-6-(trifluoromethyl)phenyl]amino]carbonyl]phenyl]-N-methyl-benzamide
- 35 In-8 3-fluoro-N-[2-fluoro-3-[[[2-iodo-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]-6-(trifluoromethyl)phenyl]amino]carbonyl]phenyl]-N-methyl-benzamide
- In-9 2-chloro-N-[3-[[[2-iodo-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]-6-(trifluoromethyl)phenyl]amino]carbonyl]phenyl]-3-pyridinecarboxamide

In-10 N-[4,6-dichloro-2-[(diethyl-lambda-4-sulfanylidene)carbamoyl]-phenyl]-2-(3-chloro-2-pyridyl)-5-(trifluoromethyl)pyrazole-3-carboxamide

In-11 N-[4-chloro-2-[(diethyl-lambda-4-sulfanylidene)carbamoyl]-6-methyl-phenyl]-2-(3-chloro-2-pyridyl)-5-(trifluoromethyl)pyrazole-3-carboxamide

5 In-12 N-[4-chloro-2-[(di-2-propyl-lambda-4-sulfanylidene)carbamoyl]-6-methyl-phenyl]-2-(3-chloro-2-pyridyl)-5-(trifluoromethyl)pyrazole-3-carboxamide

In-13 N-[4,6-dichloro-2-[(di-2-propyl-lambda-4-sulfanylidene)carbamoyl]-phenyl]-2-(3-chloro-2-pyridyl)-5-(trifluoromethyl)pyrazole-3-carboxamide

10 In-14 N-[4,6-dibromo-2-[(diethyl-lambda-4-sulfanylidene)carbamoyl]-phenyl]-2-(3-chloro-2-pyridyl)-5-(trifluoromethyl)pyrazole-3-carboxamide

In-15	Clothianidin	In-26	Cypermethrin
In-16	Thiamethoxam	In-27	Alphacypermethrin
In-17	Acetamiprid	In-28	Spinosad
In-18	Dinotefuran	25 In-29	Cyazapyr
15 In-19	Imidacloprid	In-30	Rynaxapyr
In-20	Thiacloprid	In-31	Thiodicarb
In-21	Flupyradifurone	In-32	Triflumezopyrim (Mesoionic)
In-22	Sulfoxaflor	In-33	Acephate
In-23	Methiocarb	30 In-34	Chlorpyrifos
20 In-24	Tefluthrin	In-35	Abamectin
In-25	Bifenthrin	In-36	Tioxazafen

Fungicides:

F-1	Azoxystrobin	F-19	Prothioconazole
35 F-2	Trifloxystrobin	F-20	Flutriafol
F-3	Picoxystrobin	F-21	Thiabendazole
F-4	Pyraclostrobin	55 F-22	Ipconazole
F-5	Sedaxane	F-23	Tebuconazole
F-6	Penthiopyrad	F-24	Triadimenol
40 F-7	Penflufen	F-25	Prochloraz
F-8	Fluopyram	F-26	Fluquinconazole
F-9	Fluxapyroxad	60 F-27	Triticonazole
F-10	Boscalid	F-28	Fludioxinil
F-11	Oxathiapiprolin	F-29	Carboxin
45 F-12	Metalaxyl	F-30	Silthiofarm
F-13	Metalaxyl-M	F-31	Ziram
F-14	Ethaboxam	65 F-32	Thiram
F-15	Dimethomorph	F-33	Carbendazim
F-16	Valifenalate	F-34	Thiophanate-methyl
50 F-17	Cyproconazole	F-35	Fluazinam
F-18	Difenoconazole	F-36	Fenamidon

The compounds used in the compositions of the present invention may be capable of forming salts or adducts with inorganic or organic acids or with metal ions, in particular salts with inorganic acids or N-oxides. Also the use of said compounds as salt and/or N-oxide in the inventive compositions is encompassed by the present invention.

- 5 Salts of the compounds are preferably agriculturally acceptable salts. They can be formed in a customary method, e.g. by reacting the compound with an acid of the anion in question if the respective compound has a basic functionality or by reacting an acidic compound with a suitable base.

- 10 Suitable agriculturally acceptable salts are especially the salts of those cations or the acid addition salts of those acids whose cations and anions, respectively, do not have any adverse effect on the action of the compounds according to the present invention.

Examples of inorganic acids are hydrohalic acids, such as hydrogen fluoride, hydrogen chloride, hydrogen bromide and hydrogen iodide, carbonic acid, sulfuric acid, phosphoric acid and nitric acid.

- 15 Suitable organic acids are, for example, formic acid and alkanolic acids, such as acetic acid, trifluoroacetic acid, trichloroacetic acid and propionic acid, and also glycolic acid, thiocyanic acid, lactic acid, succinic acid, citric acid, benzoic acid and other arylcarboxylic acids, cinnamic acid, oxalic acid, alkylsulfonic acids (sulfonic acids having straight-chain or  
20 branched alkyl radicals of 1 to 20 carbon atoms), arylsulfonic acids or aryldisulfonic acids (aromatic radicals, such as phenyl and naphthyl, which carry one or two sulfonic acid groups), alkylphosphonic acids (phosphonic acids having straight-chain or branched alkyl radicals with 1 to 20 carbon atoms), arylphosphonic acids or aryldiphosphonic acids (aromatic radicals, such as phenyl and naphthyl, which carry one or two phosphoric acid radicals), where the alkyl or aryl radicals may carry further substituents, for example p-  
25 toluenesulfonic acid, salicylic acid, p-aminosalicylic acid, 2-phenoxybenzoic acid, 2-acetoxybenzoic acid etc. Suitable metal ions are in particular the ions of the elements of the second main group, in particular calcium and magnesium, of the third and fourth main group, in particular aluminum, tin and lead, and also of the elements of transition groups one to eight, in particular chromium, manganese, iron, cobalt, nickel, copper, zinc, and others.  
30 Particular preference is given to the metal ions of the elements of transition groups of the fourth period. The metals can be present in the various valencies that they can assume.

- Suitable cations are in particular the ions of the alkali metals, preferably lithium, sodium and potassium, of the alkaline earth metals, preferably calcium, magnesium and barium, and of the transition metals, preferably manganese, copper, zinc and iron, and also ammonium  
35 (NH<sup>4+</sup>) and substituted ammonium in which one to four of the hydrogen atoms are replaced by C<sub>1</sub>-C<sub>4</sub>-alkyl, C<sub>1</sub>-C<sub>4</sub>-hydroxyalkyl, C<sub>1</sub>-C<sub>4</sub>-alkoxy, C<sub>1</sub>-C<sub>4</sub>-alkoxy-C<sub>1</sub>-C<sub>4</sub>-alkyl, hydroxy-C<sub>1</sub>-C<sub>4</sub>-alkoxy-C<sub>1</sub>-C<sub>4</sub>-alkyl, phenyl or benzyl. Examples of substituted ammonium ions comprise methylammonium, isopropylammonium, dimethylammonium, diisopropylammonium, trimethylammonium, tetramethylammonium, tetraethylammonium, tetrabutylammonium,  
40 2-hydroxyethylammonium, 2-(2-hydroxyethoxy)ethylammonium, bis(2-hydroxyethyl)ammonium, benzyltrimethylammonium and benzyltriethylammonium,



R<sup>a</sup> is halogen, CN, C<sub>1</sub>-C<sub>2</sub>-alkyl, C<sub>1</sub>-C<sub>2</sub>-haloalkyl, C<sub>1</sub>-C<sub>4</sub>-alkoxy, C<sub>1</sub>-C<sub>2</sub>-haloalkoxy;

R<sup>4</sup> is C<sub>1</sub>-C<sub>4</sub>-alkyl, or a group mentioned for R<sup>3</sup>; or

R<sup>3</sup> and R<sup>4</sup> may together form C<sub>5</sub>-C<sub>6</sub>-cycloalkyl, which is unsubstituted, or partially or fully substituted by R<sup>a</sup>;

R<sup>5</sup> is H, or a group mentioned for R<sup>4</sup>;

and the stereoisomers, salts, tautomers and N-oxides thereof.

According to one embodiment, said compositions are binary compositions that contain only said component I and component II as active ingredients.

10 According to one embodiment, component II is selected selected from the group of compounds consisting of 1-isopropyl-N,5-dimethyl-N-pyridazin-4-yl-pyrazole-4-carboxamide (II-1), 1-(1,2-dimethylpropyl)-N-ethyl-5-methyl-N-pyridazin-4-yl-pyrazole-4-carboxamide (II-2), N,5-dimethyl-N-pyridazin-4-yl-1-(2,2,2-trifluoro-1-methyl-ethyl)pyrazole-4-carboxamide (II-3),  
 15 1-[1-(1-cyanocyclopropyl)ethyl]-N-ethyl-5-methyl-N-pyridazin-4-yl-pyrazole-4-carboxamide (II-4), N-ethyl-1-(2-fluoro-1-methyl-propyl)-5-methyl-N-pyridazin-4-yl-pyrazole-4-carboxamide (II-5), 1-(1,2-dimethylpropyl)-N,5-dimethyl-N-pyridazin-4-yl-pyrazole-4-carboxamide (II-6), 1-[1-(1-cyanocyclopropyl)ethyl]-N,5-dimethyl-N-pyridazin-4-yl-pyrazole-4-carboxamide (II-7), N-methyl-1-(2-fluoro-1-methyl-propyl)-5-methyl-N-pyridazin-4-yl-pyrazole-4-carboxamide (II-8),  
 20 1-(4,4-difluorocyclohexyl)-N-ethyl-5-methyl-N-pyridazin-4-yl-pyrazole-4-carboxamide (II-9), 1-(4,4-difluorocyclohexyl)-N,5-dimethyl-N-pyridazin-4-yl-pyrazole-4-carboxamide (II-10), N-ethyl-1-isopropyl-5-methyl-N-pyridazin-4-yl-pyrazole-4-carboxamide (II-11), N-ethyl-5-methyl-N-pyridazin-4-yl-1-(2,2,2-trifluoro-1-methyl-ethyl)pyrazole-4-carboxamide (II-12), 1-isopropyl-N-(methoxymethyl)-5-methyl-N-pyridazin-4-yl-pyrazole-4-carboxamide (II-13), N-(methoxymethyl)-5-methyl-N-pyridazin-4-yl-1-(2,2,2-trifluoro-1-methyl-ethyl)pyrazole-4-carboxamide  
 25 (II-14), 1-(1,2-dimethylpropyl)-N-(methoxymethyl)-5-methyl-N-pyridazin-4-yl-pyrazole-4-carboxamide (II-15), 1-[1-(1-cyanocyclopropyl)ethyl]-N-(methoxymethyl)-5-methyl-N-pyridazin-4-yl-pyrazole-4-carboxamide (II-16), 1-(2-fluoro-1-methyl-propyl)-N-(methoxymethyl)-5-methyl-N-pyridazin-4-yl-pyrazole-4-carboxamide (II-17) and 1-(4,4-difluorocyclohexyl)-N-(methoxymethyl)-5-methyl-N-pyridazin-4-yl-pyrazole-4-carboxamide (II-18); and the stereoisomers,  
 30 salts, tautomers and N-oxides of each of the compounds.

According to a further embodiment, said compositions are binary compositions that contain only said component I selected from I-1 to I-31 and component II selected from II-2, II-4 and II-5 as active ingredients.

According to a specific embodiment, component II is II-2.

35 According to a further specific embodiment, component II is II-4.

According to a further specific embodiment, component II is II-5.

In Table B1, specific compositions according to the invention are individualized.

Table B1: Two-component compositions comprising one component I ("I") and one component II ("II), in particular binary compositions containing the respective components I

and II as only active ingredients.

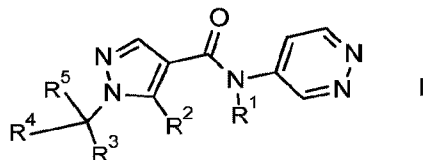
composition	I	II
B1-1	I-3	II-1
B1-2	I-3	II-2
B1-3	I-3	II-3
B1-4	I-3	II-4
B1-5	I-3	II-5
B1-6	I-3	II-6
B1-7	I-3	II-7
B1-8	I-3	II-8
B1-9	I-3	II-9
B1-10	I-3	II-10
B1-11	I-3	II-11
B1-12	I-3	II-12
B1-13	I-3	II-13
B1-14	I-3	II-14
B1-15	I-3	II-15
B1-16	I-3	II-16
B1-17	I-3	II-17
B1-18	I-3	II-18

composition	I	II
B1-19	I-4	II-1
B1-20	I-4	II-2
B1-21	I-4	II-3
B1-22	I-4	II-4
B1-23	I-4	II-5
B1-24	I-4	II-6
B1-25	I-4	II-7
B1-26	I-4	II-8
B1-27	I-4	II-9
B1-28	I-4	II-10
B1-29	I-4	II-11
B1-30	I-4	II-12
B1-31	I-4	II-13
B1-32	I-4	II-14
B1-33	I-4	II-15
B1-34	I-4	II-16
B1-35	I-4	II-17
B1-36	I-4	II-18

composition	I	II
B1-37	I-5	II-1
B1-38	I-5	II-2
B1-39	I-5	II-3
B1-40	I-5	II-4
B1-41	I-5	II-5
B1-42	I-5	II-6
B1-43	I-5	II-7
B1-44	I-5	II-8
B1-45	I-5	II-9
B1-46	I-5	II-10
B1-47	I-5	II-11
B1-48	I-5	II-12
B1-49	I-5	II-13
B1-50	I-5	II-14
B1-51	I-5	II-15
B1-52	I-5	II-16
B1-53	I-5	II-17
B1-54	I-5	II-18

According to the second aspect, the present invention relates to compositions comprising,

- 5 1) as component I a compound selected from the group consisting of the compounds I-1, I-2, I-3, I-4, I-5, I-6, I-7, I-8, I-9, I-10, I-11, I-12, I-13, I-14, I-15, I-16, I-17, I-18, I-19, I-20, I-21, I-22, I-23, I-24, I-25, I-26, I-27, I-28, I-29, I-30 and I-31;
- 2) as component II a compound of formula II:



10 wherein

R<sup>1</sup> is H, C<sub>1</sub>-C<sub>2</sub>-alkyl, or C<sub>1</sub>-C<sub>2</sub>-alkoxy-C<sub>1</sub>-C<sub>2</sub>-alkyl;

R<sup>2</sup> is CH<sub>3</sub>, or halomethyl;

R<sup>3</sup> is CN, C<sub>1</sub>-C<sub>6</sub>-alkyl, C<sub>1</sub>-C<sub>6</sub>-haloalkyl, C<sub>1</sub>-C<sub>2</sub>-alkoxy-C<sub>1</sub>-C<sub>2</sub>-alkyl, C<sub>2</sub>-C<sub>6</sub>-alkenyl and C<sub>2</sub>-C<sub>6</sub>-alkynyl, C<sub>3</sub>-C<sub>6</sub>-cycloalkyl, C<sub>5</sub>-C<sub>6</sub>-cycloalkenyl, C<sub>1</sub>-C<sub>6</sub>-alkoxy, wherein the C-atoms are

15 unsubstituted, or partially or fully substituted by R<sup>a</sup>;

R<sup>a</sup> is halogen, CN, C<sub>1</sub>-C<sub>2</sub>-alkyl, C<sub>1</sub>-C<sub>2</sub>-haloalkyl, C<sub>1</sub>-C<sub>4</sub>-alkoxy, C<sub>1</sub>-C<sub>2</sub>-haloalkoxy;

R<sup>4</sup> is C<sub>1</sub>-C<sub>4</sub>-alkyl, or a group mentioned for R<sup>3</sup>; or

R<sup>3</sup> and R<sup>4</sup> may together form C<sub>5</sub>-C<sub>6</sub>-cycloalkyl, which is unsubstituted, or partially or fully substituted by R<sup>a</sup>;

R<sup>5</sup> is H, or a group mentioned for R<sup>4</sup>;

and the stereoisomers, salts, tautomers and N-oxides thereof; and

3) as component III a compound selected from the group consisting of the compounds  
 Azoxystrobin (F-1), Trifloxystrobin (F-2), Picoxystrobin (F-3), Pyraclostrobin (F-4), Sedaxane  
 (F-5), Penthiopyrad (F-6), Penflufen (F-7), Fluopyram (F-8), Fluxapyroxad (F-9), Boscalid (F-  
 10) (F-10), Oxathiapiprolin (F-11), Metalaxyl (F-12), Metalaxyl-M (F-13), Ethaboxam (F-14),  
 dimethomorph (F-15), Valifenalate (F-16), Cyproconazole (F-17), Difenoconazole (F-18),  
 Prothioconazole (F-19), Flutriafol (F-20), Thiabendazole (F-21), Ipconazole (F-22),  
 Tebuconazole (F-23), Triadimenol (F-24), Prochloraz (F-25), Fluquinconazole (F-26),  
 15 Triticonazole (F-27), Fludioxinil (F-28), Carboxin (F-29), Silthiofarm (F-30), Ziram (F-31),  
 Thiram (F-32), Carbendazim (F-33), Thiophanate-methyl (F-34), Fluazinam (F-35),  
 Fenamidon (F-36), Fipronil (In-1), 3-[benzoyl(methyl)amino]-N-[2-bromo-4-[1,2,2,2-  
 tetrafluoro-1-(trifluoromethyl)ethyl]-6-(trifluoromethyl)phenyl]-2-fluoro-benzamide (In-2), 3-  
 (benzoylmethylamino)-N-[2-bromo-4-[1,2,2,3,3,3-hexafluoro-1-(trifluoromethyl)propyl]-6-  
 20 (trifluoromethyl)phenyl]-2-fluoro-benzamide (In-3), 3-(benzoylmethylamino)-2-fluoro-N-[2-  
 iodo-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]-6-(trifluoromethyl)phenyl]-benzamide (In-  
 4), N-[3-[[[2-iodo-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]-6-  
 (trifluoromethyl)phenyl]amino]carbonyl]phenyl]-N-methyl-benzamide (In-5), N-[3-[[[2-bromo-  
 4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]-6-(trifluoromethyl)phenyl]amino]carbonyl]-2-  
 25 fluorophenyl]-4-fluoro-N-methyl-benzamide (In-6), 4-fluoro-N-[2-fluoro-3-[[[2-iodo-4-[1,2,2,2-  
 tetrafluoro-1-(trifluoromethyl)ethyl]-6-(trifluoromethyl)phenyl]amino]carbonyl]phenyl]-N-  
 methyl-benzamide (In-7), 3-fluoro-N-[2-fluoro-3-[[[2-iodo-4-[1,2,2,2-tetrafluoro-1-  
 (trifluoromethyl)ethyl]-6-(trifluoromethyl)phenyl]amino]carbonyl]phenyl]-N-methyl-benzamide  
 (In-8), 2-chloro-N-[3-[[[2-iodo-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]-6-  
 30 (trifluoromethyl)phenyl]amino]carbonyl]phenyl]-3-pyridinecarboxamide (In-9), N-[4,6-dichloro-  
 2-[(diethyl-lambda-4-sulfanylidene)carbamoyl]-phenyl]-2-(3-chloro-2-pyridyl)-5-  
 (trifluoromethyl)pyrazole-3-carboxamide (In-10), N-[4-chloro-2-[(diethyl-lambda-4-  
 sulfanylidene)carbamoyl]-6-methyl-phenyl]-2-(3-chloro-2-pyridyl)-5-(trifluoromethyl)pyrazole-  
 3-carboxamide (In-11), N-[4-chloro-2-[(di-2-propyl-lambda-4-sulfanylidene)carbamoyl]-6-  
 35 methyl-phenyl]-2-(3-chloro-2-pyridyl)-5-(trifluoromethyl)pyrazole-3-carboxamide (In-12), N-  
 [4,6-dichloro-2-[(di-2-propyl-lambda-4-sulfanylidene)carbamoyl]-phenyl]-2-(3-chloro-2-  
 pyridyl)-5-(trifluoromethyl)pyrazole-3-carboxamide (In-13), N-[4,6-dibromo-2-[(diethyl-  
 lambda-4-sulfanylidene)carbamoyl]-phenyl]-2-(3-chloro-2-pyridyl)-5-(trifluoromethyl)pyrazole-  
 3-carboxamide (In-14), Clothianidin (In-15), Thiamethoxam (In-16), Acetamiprid (In-17),  
 40 Dinotefuran (In-18), Imidacloprid (In-19), Thiacloprid (In-20), Flupyradifurone (In-21),  
 Sulfoxaflor (In-22), Methiocarb (In-23), Tefluthrin (In-24), Bifenthrin (In-25), Cypermethrin (In-

26), Alphacypermethrin (In-27), Spinosad (In-28), Cyazypyr (In-29), Rynaxapyr (In-30), Thiodicarb (In-31), Triflumezopyrim (Mesoionic) (In-32), Acephate (In-33), Chlorpyrifos (In-34), Abamectin (In-35) and Tioxazafen (In-36), or the N-oxides or the agriculturally acceptable salts of each of the compounds. According to one embodiment, said compositions are ternary compositions that contain only said component I selected from I-1 to I-31, component II selected from II-1 to II-18 and component III as active ingredients.

According to one embodiment, component III is selected from the group consisting of the compounds Azoxystrobin (F-1), Trifloxystrobin (F-2), Picoxystrobin (F-3), Pyraclostrobin (F-4), Sedaxane (F-5), Penthiopyrad (F-6), Penflufen (F-7), Fluopyram (F-8), Fluxapyroxad (F-9), Boscalid (F-10), Oxathiapiprolin (F-11), Metalaxyl (F-12), Metalaxyl-M (F-13), Ethaboxam (F-14), dimethomorph (F-15), Valifenalate (F-16), Cyproconazole (F-17), Difenoconazole (F-18), Prothioconazole (F-19), Flutriafol (F-20), Thiabendazole (F-21), Ipconazole (F-22), Tebuconazole (F-23), Triadimenol (F-24), Prochloraz (F-25), Fluquinconazole (F-26), Triticonazole (F-27), Fludioxinil (F-28), Carboxin (F-29), Silthiofarm (F-30), Ziram (F-31), Thiram (F-32), Carbendazim (F-33), Thiophanate-methyl (F-34), Fluazinam (F-35) and Fenamidon (F-36), or the N-oxides or the agriculturally acceptable salts of each of the compounds. According to one embodiment, said compositions are ternary compositions that contain only said component I selected from I-1 to I-31, component II selected from II-1 to II-18 and component III as active ingredients.

According to a further embodiment, component III is selected from the group consisting of the compounds Fipronil (In-1), 3-[benzoyl(methyl)amino]-N-[2-bromo-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]-6-(trifluoromethyl)phenyl]-2-fluoro-benzamide (In-2), 3-(benzoylmethylamino)-N-[2-bromo-4-[1,2,2,3,3,3-hexafluoro-1-(trifluoromethyl)propyl]-6-(trifluoromethyl)phenyl]-2-fluoro-benzamide (In-3), 3-(benzoylmethylamino)-2-fluoro-N-[2-iodo-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]-6-(trifluoromethyl)phenyl]-benzamide (In-4), N-[3-[[[2-iodo-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]-6-(trifluoromethyl)phenyl]amino]carbonyl]phenyl]-N-methyl-benzamide (In-5), N-[3-[[[2-bromo-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]-6-(trifluoromethyl)phenyl]amino]carbonyl]-2-fluorophenyl]-4-fluoro-N-methyl-benzamide (In-6), 4-fluoro-N-[2-fluoro-3-[[[2-iodo-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]-6-(trifluoromethyl)phenyl]amino]carbonyl]phenyl]-N-methyl-benzamide (In-7), 3-fluoro-N-[2-fluoro-3-[[[2-iodo-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]-6-(trifluoromethyl)phenyl]amino]carbonyl]phenyl]-N-methyl-benzamide (In-8), 2-chloro-N-[3-[[[2-iodo-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]-6-(trifluoromethyl)phenyl]amino]carbonyl]phenyl]-3-pyridinecarboxamide (In-9), N-[4,6-dichloro-2-[(diethyl-lambda-4-sulfanylidene)carbonyl]-phenyl]-2-(3-chloro-2-pyridyl)-5-(trifluoromethyl)pyrazole-3-carboxamide (In-10), N-[4-chloro-2-[(diethyl-lambda-4-sulfanylidene)carbonyl]-6-methyl-phenyl]-2-(3-chloro-2-pyridyl)-5-(trifluoromethyl)pyrazole-3-carboxamide (In-11), N-[4-chloro-2-[(di-2-propyl-lambda-4-sulfanylidene)carbonyl]-6-methyl-phenyl]-2-(3-chloro-2-pyridyl)-5-(trifluoromethyl)pyrazole-3-carboxamide (In-12), N-[4,6-dichloro-2-[(di-2-propyl-lambda-4-sulfanylidene)carbonyl]-phenyl]-2-(3-chloro-2-pyridyl)-5-(trifluoromethyl)pyrazole-3-carboxamide (In-13), N-[4,6-dibromo-2-[(diethyl-lambda-4-sulfanylidene)carbonyl]-phenyl]-2-(3-chloro-2-pyridyl)-5-(trifluoromethyl)pyrazole-

3-carboxamide (In-14), Clothianidin (In-15), Thiamethoxam (In-16), Acetamiprid (In-17), Dinotefuran (In-18), Imidacloprid (In-19), Thiacloprid (In-20), Flupyradifurone (In-21), Sulfoxaflor (In-22), Methiocarb (In-23), Tefluthrin (In-24), Bifenthrin (In-25), Cypermethrin (In-26), Alphacypermethrin (In-27), Spinosad (In-28), Cyazypyr (In-29), Rynaxapyr (In-30),  
 5 Thiodicarb (In-31), Triflumezopyrim (Mesoionic) (In-32), Acephate (In-33), Chlorpyrifos (In-34), Abamectin (In-35) and Tioxazafen (In-36), or the N-oxides or the agriculturally acceptable salts of each of the compounds. According to one embodiment, said compositions are ternary compositions that contain only said component I selected from I-1 to I-31, component II selected from II-1 to II-18 and component III as active ingredients.

10 According to still a further embodiment, component III is selected from the group consisting of the compounds 3-[benzoyl(methyl)amino]-N-[2-bromo-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]-6-(trifluoromethyl)phenyl]-2-fluoro-benzamide (In-2), 3-(benzoylmethylamino)-N-[2-bromo-4-[1,2,2,3,3,3-hexafluoro-1-(trifluoromethyl)propyl]-6-(trifluoromethyl)phenyl]-2-fluoro-benzamide (In-3), 3-(benzoylmethylamino)-2-fluoro-N-[2-  
 15 iodo-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]-6-(trifluoromethyl)phenyl]-benzamide (In-4), N-[3-[[[2-iodo-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]-6-(trifluoromethyl)phenyl]amino]carbonyl]phenyl]-N-methyl-benzamide (In-5), N-[3-[[[2-bromo-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]-6-(trifluoromethyl)phenyl]amino]carbonyl]-2-fluorophenyl]-4-fluoro-N-methyl-benzamide (In-6), 4-fluoro-N-[2-fluoro-3-[[[2-iodo-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]-6-(trifluoromethyl)phenyl]amino]carbonyl]phenyl]-N-methyl-benzamide (In-7) and 3-fluoro-N-[2-fluoro-3-[[[2-iodo-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]-6-(trifluoromethyl)phenyl]amino]carbonyl]phenyl]-N-methyl-benzamide (In-8), 2-chloro-N-[3-[[[2-iodo-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]-6-(trifluoromethyl)phenyl]amino]carbonyl]phenyl]-3-pyridinecarboxamide (In-9), or the N-oxides  
 25 or the agriculturally acceptable salts of each of the compounds.

According to still a further embodiment, component III is selected from the group consisting of the compounds N-[4,6-dichloro-2-[(diethyl-lambda-4-sulfanylidene)carbamoyl]-phenyl]-2-(3-chloro-2-pyridyl)-5-(trifluoromethyl)pyrazole-3-carboxamide (In-10), N-[4-chloro-2-[(diethyl-lambda-4-sulfanylidene)carbamoyl]-6-methyl-phenyl]-2-(3-chloro-2-pyridyl)-5-(trifluoromethyl)pyrazole-3-carboxamide (In-11), N-[4-chloro-2-[(di-2-propyl-lambda-4-sulfanylidene)carbamoyl]-6-methyl-phenyl]-2-(3-chloro-2-pyridyl)-5-(trifluoromethyl)pyrazole-3-carboxamide (In-12), N-[4,6-dichloro-2-[(di-2-propyl-lambda-4-sulfanylidene)carbamoyl]-phenyl]-2-(3-chloro-2-pyridyl)-5-(trifluoromethyl)pyrazole-3-carboxamide (In-13), N-[4,6-dibromo-2-[(diethyl-lambda-4-sulfanylidene)carbamoyl]-phenyl]-2-(3-chloro-2-pyridyl)-5-(trifluoromethyl)pyrazole-3-carboxamide (In-14), or the N-oxides or the agriculturally acceptable salts of each of the compounds.

According to one embodiment, said compositions are ternary compositions that contain only said component I selected from I-1 to I-31, in particular I-3, component II selected from II-1 to II-18, in particular selected from II-2, II-4 and II-5, and component III as active ingredients.

40 In Table T1, specific compositions according to the invention are individualized.

Table T1: Three-component compositions comprising one component I ("I"), one component

II (“II”) and one component III (“III”), in particular ternary compositions containing the respective components I, II and III as only active ingredients.

composition	I	II	III
T1-1	I-3	II-2	F-1
T1-2	I-3	II-2	F-2
T1-3	I-3	II-2	F-3
T1-4	I-3	II-2	F-4
T1-5	I-3	II-2	F-5
T1-6	I-3	II-2	F-6
T1-7	I-3	II-2	F-7
T1-8	I-3	II-2	F-8
T1-9	I-3	II-2	F-9
T1-10	I-3	II-2	F-10
T1-11	I-3	II-2	F-11
T1-12	I-3	II-2	F-12
T1-13	I-3	II-2	F-13
T1-14	I-3	II-2	F-14
T1-15	I-3	II-2	F-15
T1-16	I-3	II-2	F-16
T1-17	I-3	II-2	F-17
T1-18	I-3	II-2	F-18
T1-19	I-3	II-2	F-19
T1-20	I-3	II-2	F-20
T1-21	I-3	II-2	F-21
T1-22	I-3	II-2	F-22
T1-23	I-3	II-2	F-23
T1-24	I-3	II-2	F-24
T1-25	I-3	II-2	F-25
T1-26	I-3	II-2	F-26
T1-27	I-3	II-2	F-27
T1-28	I-3	II-2	F-28
T1-29	I-3	II-2	F-29
T1-30	I-3	II-2	F-30
T1-31	I-3	II-2	F-31
T1-32	I-3	II-2	F-32
T1-33	I-3	II-2	F-33
T1-34	I-3	II-2	F-34
T1-35	I-3	II-2	F-35
T1-36	I-3	II-2	F-36
T1-37	I-3	II-2	In-1

composition	I	II	III
T1-38	I-3	II-2	In-2
T1-39	I-3	II-2	In-3
T1-40	I-3	II-2	In-4
T1-41	I-3	II-2	In-5
T1-42	I-3	II-2	In-6
T1-43	I-3	II-2	In-7
T1-44	I-3	II-2	In-8
T1-45	I-3	II-2	In-9
T1-46	I-3	II-2	In-10
T1-47	I-3	II-2	In-11
T1-48	I-3	II-2	In-12
T1-49	I-3	II-2	In-13
T1-50	I-3	II-2	In-14
T1-51	I-3	II-2	In-15
T1-52	I-3	II-2	In-16
T1-53	I-3	II-2	In-17
T1-54	I-3	II-2	In-18
T1-55	I-3	II-2	In-19
T1-56	I-3	II-2	In-20
T1-57	I-3	II-2	In-21
T1-58	I-3	II-2	In-22
T1-59	I-3	II-2	In-23
T1-60	I-3	II-2	In-24
T1-61	I-3	II-2	In-25
T1-62	I-3	II-2	In-26
T1-63	I-3	II-2	In-27
T1-64	I-3	II-2	In-28
T1-65	I-3	II-2	In-29
T1-66	I-3	II-2	In-30
T1-67	I-3	II-2	In-31
T1-68	I-3	II-2	In-32
T1-69	I-3	II-2	In-33
T1-70	I-3	II-2	In-34
T1-71	I-3	II-2	In-35
T1-72	I-3	II-2	In-36
T1-73	I-3	II-4	F-1
T1-74	I-3	II-4	F-2

composition	I	II	III
T1-75	I-3	II-4	F-3
T1-76	I-3	II-4	F-4
T1-77	I-3	II-4	F-5
T1-78	I-3	II-4	F-6
T1-79	I-3	II-4	F-7
T1-80	I-3	II-4	F-8
T1-81	I-3	II-4	F-9
T1-82	I-3	II-4	F-10
T1-83	I-3	II-4	F-11
T1-84	I-3	II-4	F-12
T1-85	I-3	II-4	F-13
T1-86	I-3	II-4	F-14
T1-87	I-3	II-4	F-15
T1-88	I-3	II-4	F-16
T1-89	I-3	II-4	F-17
T1-90	I-3	II-4	F-18
T1-91	I-3	II-4	F-19
T1-92	I-3	II-4	F-20
T1-93	I-3	II-4	F-21
T1-94	I-3	II-4	F-22
T1-95	I-3	II-4	F-23
T1-96	I-3	II-4	F-24
T1-97	I-3	II-4	F-25
T1-98	I-3	II-4	F-26
T1-99	I-3	II-4	F-27
T1-100	I-3	II-4	F-28
T1-101	I-3	II-4	F-29
T1-102	I-3	II-4	F-30
T1-103	I-3	II-4	F-31
T1-104	I-3	II-4	F-32
T1-105	I-3	II-4	F-33
T1-106	I-3	II-4	F-34
T1-107	I-3	II-4	F-35
T1-108	I-3	II-4	F-36
T1-109	I-3	II-4	In-1
T1-110	I-3	II-4	In-2
T1-111	I-3	II-4	In-3
T1-112	I-3	II-4	In-4
T1-113	I-3	II-4	In-5
T1-114	I-3	II-4	In-6

composition	I	II	III
T1-115	I-3	II-4	In-7
T1-116	I-3	II-4	In-8
T1-117	I-3	II-4	In-9
T1-118	I-3	II-4	In-10
T1-119	I-3	II-4	In-11
T1-120	I-3	II-4	In-12
T1-121	I-3	II-4	In-13
T1-122	I-3	II-4	In-14
T1-123	I-3	II-4	In-15
T1-124	I-3	II-4	In-16
T1-125	I-3	II-4	In-17
T1-126	I-3	II-4	In-18
T1-127	I-3	II-4	In-19
T1-128	I-3	II-4	In-20
T1-129	I-3	II-4	In-21
T1-130	I-3	II-4	In-22
T1-131	I-3	II-4	In-23
T1-132	I-3	II-4	In-24
T1-133	I-3	II-4	In-25
T1-134	I-3	II-4	In-26
T1-135	I-3	II-4	In-27
T1-136	I-3	II-4	In-28
T1-137	I-3	II-4	In-29
T1-138	I-3	II-4	In-30
T1-139	I-3	II-4	In-31
T1-140	I-3	II-4	In-32
T1-141	I-3	II-4	In-33
T1-142	I-3	II-4	In-34
T1-143	I-3	II-4	In-35
T1-144	I-3	II-4	In-36
T1-145	I-3	II-5	F-1
T1-146	I-3	II-5	F-2
T1-147	I-3	II-5	F-3
T1-148	I-3	II-5	F-4
T1-149	I-3	II-5	F-5
T1-150	I-3	II-5	F-6
T1-151	I-3	II-5	F-7
T1-152	I-3	II-5	F-8
T1-153	I-3	II-5	F-9
T1-154	I-3	II-5	F-10

composition	I	II	III
T1-155	I-3	II-5	F-11
T1-156	I-3	II-5	F-12
T1-157	I-3	II-5	F-13
T1-158	I-3	II-5	F-14
T1-159	I-3	II-5	F-15
T1-160	I-3	II-5	F-16
T1-161	I-3	II-5	F-17
T1-162	I-3	II-5	F-18
T1-163	I-3	II-5	F-19
T1-164	I-3	II-5	F-20
T1-165	I-3	II-5	F-21
T1-166	I-3	II-5	F-22
T1-167	I-3	II-5	F-23
T1-168	I-3	II-5	F-24
T1-169	I-3	II-5	F-25
T1-170	I-3	II-5	F-26
T1-171	I-3	II-5	F-27
T1-172	I-3	II-5	F-28
T1-173	I-3	II-5	F-29
T1-174	I-3	II-5	F-30
T1-175	I-3	II-5	F-31
T1-176	I-3	II-5	F-32
T1-177	I-3	II-5	F-33
T1-178	I-3	II-5	F-34
T1-179	I-3	II-5	F-35
T1-180	I-3	II-5	F-36
T1-181	I-3	II-5	In-1
T1-182	I-3	II-5	In-2
T1-183	I-3	II-5	In-3
T1-184	I-3	II-5	In-4
T1-185	I-3	II-5	In-5

composition	I	II	III
T1-186	I-3	II-5	In-6
T1-187	I-3	II-5	In-7
T1-188	I-3	II-5	In-8
T1-189	I-3	II-5	In-9
T1-190	I-3	II-5	In-10
T1-191	I-3	II-5	In-11
T1-192	I-3	II-5	In-12
T1-193	I-3	II-5	In-13
T1-194	I-3	II-5	In-14
T1-195	I-3	II-5	In-15
T1-196	I-3	II-5	In-16
T1-197	I-3	II-5	In-17
T1-198	I-3	II-5	In-18
T1-199	I-3	II-5	In-19
T1-200	I-3	II-5	In-20
T1-201	I-3	II-5	In-21
T1-202	I-3	II-5	In-22
T1-203	I-3	II-5	In-23
T1-204	I-3	II-5	In-24
T1-205	I-3	II-5	In-25
T1-206	I-3	II-5	In-26
T1-207	I-3	II-5	In-27
T1-208	I-3	II-5	In-28
T1-209	I-3	II-5	In-29
T1-210	I-3	II-5	In-30
T1-211	I-3	II-5	In-31
T1-212	I-3	II-5	In-32
T1-213	I-3	II-5	In-33
T1-214	I-3	II-5	In-34
T1-215	I-3	II-5	In-35
T1-216	I-3	II-5	In-36

5

The weight ratio of component I to component II in the inventive compositions may be from 20000:1 to 1:20000, such as 16000:1 to 1:16000, in particular from 5000:1 to 1:5000, more preferably from 1000:1 to 1:1000, more specifically 500:1 to 1:500, particularly 100:1 to 1:100.

The weight ratio of component I to component II may particularly be in the range of from 1:100 to 100:1, frequently in the range of from 1:50 to 50:1, preferably in the range of from 1:20 to 20:1, particularly preferably in the range of from 1:10 to 10:1, in particular in the range

of from 1:3 to 3:1. It may also be preferable for the weight ratio to be in the range of from 1:2 to 2:1.

According to one embodiment, the compositions according to the invention may preferably have weight ratios of component I versus component II in the range of from 1000:1 to 1:1, often in the range of from 100:1 to 1:1, regularly in the range of from 50:1 to 1:1, preferably in the range of from 20:1 to 1:1, more preferably in the range of from 10:1 to 1:1, even more preferably in the range of from 4:1 to 1:1 and in particular in the range of from 2:1 to 1:1.

According to a further embodiment, the compositions according to the invention may preferably have weight ratios of component I versus component II usually is in the range of from 1:1 to 1000, often in the range of from 1:1 to 1:100, regularly in the range of from 1:1 to 1:50, preferably in the range of from 1:1 to 1:20, more preferably in the range of from 1:1 to 1:10, even more preferably in the range of from 1:1 to 1:4 and in particular in the range of from 1:1 to 1:2.

In the inventive three-component-compositions, the weight ratio of component I to component II depends on the properties of the active compounds in question and may particularly be 1000:1 to 1:1000, specifically 500:1 to 1:500. Preferably, it is in the range of from 1:100 to 100:1, preferably in the range of from 1:50 to 50:1 and in particular in the range of from 1:20 to 20:1. It may be preferable for the weight ratio to be in the region of from 1:10 to 10:1, preferably from 1:3 to 3:1, in particular from 1:2 to 2:1. The weight ratio of component I to the component III may particularly be 1000:1 to 1:1000, specifically 500:1 to 1:500. It is preferably in the range of from 1:100 to 100:1, preferably in the range of from 1:50 to 50:1 and in particular in the range of from 1:20 to 20:1. It may be preferable for the weight ratio to be in the region of from 1:10 to 10:1, preferably from 1:3 to 3:1, in particular from 1:2 to 2:1. The weight ratio of component II to component III is preferably in the range of from 1:100 to 100:1, frequently in the range of from 1:50 to 50:1, preferably in the range of from 1:20 to 20:1, and in particular in the range of from 1:10 to 10:1. It may be preferable for the weight to be in the range of from 1:3 to 3:1, in particular from 1:2 to 2:1.

In the mixtures and compositions, the compound ratios of the active ingredients are advantageously chosen so as to produce a synergistic effect.

The invention also provides pesticidal compositions, comprising a liquid and/or solid carrier and an inventive composition.

The invention furthermore relates to the use of the inventive compositions for controlling phytopathogenic fungi as detailed herein and preparations or compositions comprising them. The invention furthermore also relates to seed comprising the compositions. The invention furthermore also relates to methods for controlling phytopathogenic fungi as detailed herein, wherein the fungi or the materials, plants, the soil or seed to be protected from fungal attack are treated with an effective amount of a compositions according to the invention. The invention furthermore also relates to processes for preparing the compositions according to the invention.

The compositions may be used by treating the fungi or the plants, plant propagation

materials, such as seeds, soil, surfaces, materials or rooms to be protected from fungal attack with a fungicidally effective amount of the active substances. The application can be carried out both before and after the infection of the plants, plant propagation materials, such as seeds, soil, surfaces, materials or rooms by the fungi.

- 5 By applying the components of the inventive composition or the composition, respectively, a synergistic effect can be obtained, i.e. more than simple addition of the individual effects is obtained (synergistic mixtures).

This can be obtained by applying the components simultaneously, either jointly (e. g. as tank-mix) or separately, or in succession, wherein the time interval between the individual  
10 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.

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

The compositions according to the invention may effectively be used against a broad spectrum of phytopathogenic fungi, including soil-borne fungi, which derive especially from the classes of the Plasmodiophoromycetes, Peronosporomycetes (syn. Oomycetes),  
20 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 compositions according to the invention are particularly important in the control of a  
25 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,  
30 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  
35 corn, soybean, rape, sugar cane or oil palm; corn; tobacco; nuts; coffee; tea; bananas; vines (table grapes and grape juice grape vines); hop; turf; sweet leaf (also called Stevia); 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.

40 Preferably, the 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 compositions or the components 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. 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.

Plants that have been modified by breeding, mutagenesis or genetic engineering, e. g. have been rendered tolerant to applications of specific classes of herbicides, such as auxin herbicides such as dicamba or 2,4-D; bleacher herbicides such as hydroxyl-phenylpyruvate dioxygenase (HPPD) inhibitors or phytoene desaturase (PDS) inhibitors; acetolactate synthase (ALS) inhibitors such as sulfonyl ureas or imidazolinones; enolpyruvylshikimate-3-phosphate synthase (EPSPS) inhibitors, such as glyphosate; glutamine synthetase (GS) inhibitors such as glufosinate; protoporphyrinogen-IX oxidase inhibitors; lipid biosynthesis inhibitors such as acetyl CoA carboxylase (ACCase) inhibitors; or oxynil (i. e. bromoxynil or ioxynil) herbicides as a result of conventional methods of breeding or genetic engineering. Furthermore, plants have been made resistant to multiple classes of herbicides through multiple genetic modifications, such as resistance to both glyphosate and glufosinate or to both glyphosate and a herbicide from another class such as ALS inhibitors, HPPD inhibitors, auxin herbicides, or ACCase inhibitors. These herbicide resistance technologies are e. g. described in Pest Managem. Sci. 61, 2005, 246; 61, 2005, 258; 61, 2005, 277; 61, 2005, 269; 61, 2005, 286; 64, 2008, 326; 64, 2008, 332; Weed Sci. 57, 2009, 108; Austral. J. Agricult. Res. 58, 2007, 708; Science 316, 2007, 1185; and references quoted therein. Several cultivated plants have been rendered tolerant to herbicides by conventional methods of breeding (mutagenesis), e. g. Clearfield® summer rape (Canola, BASF™ SE, Germany) being tolerant to imidazolinones, e. g. imazamox, or ExpressSun® sunflowers (DuPont™, USA)

being tolerant to sulfonyl ureas, e. g. tribenuron. Genetic engineering methods have been used to render cultivated plants such as soybean, cotton, corn, beets and rape, tolerant to herbicides such as glyphosate and glufosinate, some of which are commercially available under the trade names RoundupReady® (glyphosate-tolerant, Monsanto, U.S.A.), Cultivance® (imidazolinone tolerant, BASF SE, Germany) and LibertyLink® (glufosinate-tolerant, Bayer CropScience, Germany).

Furthermore, plants are also covered that are by the use of recombinant DNA techniques capable to synthesize one or more insecticidal proteins, especially those known from the bacterial genus *Bacillus*, particularly from *Bacillus thuringiensis*, such as  $\delta$ -endotoxins, e. g. CryIA(b), CryIA(c), CryIF, CryIF(a2), CryIIA(b), CryIIIA, CryIIIB(b1) or Cry9c; vegetative insecticidal proteins (VIP), e. g. VIP1, VIP2, VIP3 or VIP3A; insecticidal proteins of bacteria colonizing nematodes, e. g. *Photorhabdus* spp. or *Xenorhabdus* spp.; toxins produced by animals, such as scorpion toxins, arachnid toxins, wasp toxins, or other insect-specific neurotoxins; toxins produced by fungi, such Streptomyces toxins, plant lectins, such as pea or barley lectins; agglutinins; proteinase inhibitors, such as trypsin inhibitors, serine protease inhibitors, patatin, cystatin or papain inhibitors; ribosome-inactivating proteins (RIP), such as ricin, maize-RIP, abrin, luffin, saporin or bryodin; steroid metabolism enzymes, such as 3-hydroxysteroid oxidase, ecdysteroid-IDP-glycosyl-transferase, cholesterol oxidases, ecdysone inhibitors or HMG-CoA-reductase; ion channel blockers, such as blockers of sodium or calcium channels; juvenile hormone esterase; diuretic hormone receptors (helicokinin receptors); stilbene synthase, bibenzyl synthase, chitinases or glucanases. In the context of the present invention these insecticidal proteins or toxins are to be understood expressly also as pre-toxins, hybrid proteins, truncated or otherwise modified proteins. Hybrid proteins are characterized by a new combination of protein domains, (see, e. g. WO 02/015701). Further examples of such toxins or genetically modified plants capable of synthesizing such toxins are disclosed, e. g., in EP-A 374 753, WO 93/007278, WO 95/34656, EP-A 427 529, EP-A 451 878, WO 03/18810 und WO 03/52073. The methods for producing such genetically modified plants are generally known to the person skilled in the art and are described, e. g. in the publications mentioned above. These insecticidal proteins contained in the genetically modified plants impart to the plants producing these proteins tolerance to harmful pests from all taxonomic groups of arthropods, especially to beetles (Coeloptera), two-winged insects (Diptera), and moths (Lepidoptera) and to nematodes (Nematoda). Genetically modified plants capable to synthesize one or more insecticidal proteins are, e. g., described in the publications mentioned above, and some of which are commercially available such as YieldGard® (corn cultivars producing the Cry1Ab toxin), YieldGard® Plus (corn cultivars producing Cry1Ab and Cry3Bb1 toxins), Starlink® (corn cultivars producing the Cry9c toxin), Herculex® RW (corn cultivars producing Cry34Ab1, Cry35Ab1 and the enzyme phosphinothricin-N-acetyltransferase [PAT]); NuCOTN® 33B (cotton cultivars producing the Cry1Ac toxin), Bollgard® I (cotton cultivars producing the Cry1Ac toxin), Bollgard® II (cotton cultivars producing Cry1Ac and Cry2Ab2 toxins); VIPCOT® (cotton cultivars producing a VIP-toxin); NewLeaf® (potato cultivars producing the Cry3A toxin); Bt-Xtra®, NatureGard®, KnockOut®, BiteGard®, Protecta®, Bt11

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

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

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

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

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

The 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.), e. g. Southern leaf blight (*D. maydis*) or Northern leaf blight (*B. zeicola*) on corn, e. g. spot blotch (*B. sorokiniana*) on cereals and e. g. *B. oryzae* on rice 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 (e. g. Gray leaf spot: *C. zea-maydis*), rice, sugar beets (e. g. *C. beticola*), sugar cane, vegetables, coffee, soybeans (e. g. *C. soja* 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*: Anthracnose stalk rot), soft fruits, potatoes (e. g. *C. coccodes*: black dot), beans (e. g. *C. lindemuthianum*) and soybeans (e. g. *C. truncatum* or *C. gloeosporioides*); *Corticium* spp., e. g. *C. sasakii* (sheath blight) on rice; *Corynespora cassiicola* (leaf spots) on soybeans and ornamentals; *Cycloconium* spp., e. g. *C. oleaginum* on olive trees; *Cylindrocarpon* spp. (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*, *Phaeoconiella 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. zea*) 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; *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 rot) on various plants, such as paprika and cucurbits (e. g. *P. capsici*), soybeans (e. g. *P. megasperma*, syn. *P. sojae*), potatoes and tomatoes (e. g. *P. infestans*: late blight) and broad-leaved trees (e. g. *P. ramorum*: sudden oak death); *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; *Pseudopezizcula tracheiphila* (red fire disease or 'rotbrenner', anamorph: *Phialophora*) on vines; *Puccinia* spp. (rusts) on various plants, e. g. *P. triticina* (brown or leaf rust), *P. striiformis* (stripe or yellow rust), *P. hordei* (dwarf rust), *P. graminis* (stem or black rust) or *P. recondita* (brown or leaf rust) on cereals, such as e. g. wheat, barley or rye, *P. kuehnii* (orange rust) on sugar cane and *P. asparagi* on asparagus; *Pyrenophora* (anamorph: *Drechslera*) *tritici-repentis* (tan spot) on wheat or *P. teres* (net blotch) on barley; *Pyricularia* spp., e. g. *P. oryzae* (teleomorph: *Magnaporthe grisea*, rice blast) on rice and *P. grisea* on turf and cereals; *Pythium* spp. (damping-off) on turf, rice, corn, wheat, cotton, rape, sunflowers, soybeans, sugar beets, vegetables and various other plants (e. g. *P. ultimum* or *P. aphanidermatum*); *Ramularia* spp., e. g. *R. collo-cygni* (Ramularia leaf spots, Physiological leaf spots) on barley and *R. beticola* on sugar beets; *Rhizoctonia* spp. on cotton, rice, potatoes, turf, corn, rape, potatoes, sugar beets, vegetables and various other plants, e. g. *R. solani* (root and stem rot) on soybeans, *R. solani* (sheath blight) on rice or *R. cerealis* (Rhizoctonia spring blight) on wheat or barley; *Rhizopus stolonifer* (black mold, soft rot) on strawberries, carrots, cabbage, vines and tomatoes; *Rhynchosporium secalis* (scald) on barley, rye and triticale; *Sarocladium oryzae* and *S. attenuatum* (sheath rot) on rice; *Sclerotinia* spp. (stem rot or white mold) on vegetables and field crops, such as rape, sunflowers (e. g. *S. sclerotiorum*) and soybeans (e. g. *S. rolfsii* or *S. sclerotiorum*); *Septoria* spp. on various plants, e. g. *S. glycines* (brown spot) on soybeans, *S. tritici* (Septoria blotch) on wheat and *S.* (syn. *Stagonospora*) *nodorum* (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 and sugar cane; *Sphaerotheca fuliginea* (powdery mildew) on cucurbits; *Spongospora subterranea* (powdery scab) on potatoes and thereby transmitted viral diseases; *Stagonospora* spp. on cereals, e. g. *S. nodorum* (Stagonospora blotch, teleomorph: *Leptosphaeria* [syn. *Phaeosphaeria*] *nodorum*) on wheat; *Synchytrium endobioticum* on potatoes (potato wart disease); *Taphrina* spp., e. g. *T. deformans* (leaf curl disease) on peaches and *T. pruni* (plum pocket) on plums; *Thielaviopsis* spp. (black root rot) on tobacco, pome fruits, vegetables, soybeans and cotton, e. g. *T. basicola* (syn. *Chalara elegans*); *Tilletia* spp. (common bunt or stinking smut) on cereals, such as e. g. *T. tritici* (syn. *T. caries*, wheat bunt) and *T. controversa* (dwarf bunt) on wheat; *Typhula incarnata* (grey snow mold) on barley or wheat; *Urocystis* spp., e. g. *U. occulta* (stem smut) on rye; *Uromyces* spp. (rust) on vegetables, such as beans (e. g. *U. appendiculatus*, syn. *U. phaseoli*) and sugar beets (e. g. *U. betae*); *Ustilago* spp. (loose smut) on cereals (e. g. *U. nuda* and *U. avenae*), corn (e. g. *U. maydis*: corn smut) and sugar cane; *Venturia* spp. (scab) on apples (e. g. *V. inaequalis*) and pears; and *Verticillium* spp. (wilt) on various plants, such as fruits and ornamentals, vines, soft fruits, vegetables and field crops, e. g. *V. dahliae* on strawberries, rape, potatoes and tomatoes.

The compositions are also suitable for controlling harmful fungi in the protection of stored products or harvest and in the protection of materials.

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

Bacteria pathogenic for plants are responsible for devastating losses in agriculture. The use of antibiotics to control such infections is restricted in many countries due to worries over the evolution and transmission of antibiotic resistance.

The compositions according to the invention may also be suitable as bactericides. They may be distinguished by an outstanding effectiveness against a broad spectrum of phytopathogenic bacteria, including soil-borne bacteria, which derive especially from the genera of *Agrobacterium*, *Clavibacter*, *Corynebacterium*, *Erwinia*, *Leifsonia*, *Pectobacterium*, *Pseudomonas*, *Ralstonia*, *Xanthomonas* (e. g. *Xanthomonas oryzae* causing bacterial blight on rice) and *Xylella*; preferably *Erwinia*; even more preferably *Erwinia amylovora* causing fire

blight on apples, pears and other member of the family Rosaceae.

The method of treatment according to the invention can also be used in the field of protecting stored products or harvest against attack of fungi and microorganisms. According to the present invention, the term "stored products" is understood to denote natural substances of plant or animal origin and their processed forms, which have been taken from the natural life cycle and for which long-term protection is desired. Stored products of crop plant origin, such as plants or parts thereof, for example stalks, leafs, tubers, seeds, fruits or grains, can be protected in the freshly harvested state or in processed form, such as pre-dried, moistened, comminuted, ground, pressed or roasted, which process is also known as post-harvest treatment. Also falling under the definition of stored products is timber, whether in the form of crude timber, such as construction timber, electricity pylons and barriers, or in the form of finished articles, such as furniture or objects made from wood. Stored products of animal origin are hides, leather, furs, hairs and the like. The combinations according the present invention can prevent disadvantageous effects such as decay, discoloration or mold. Preferably "stored products" is understood to denote natural substances of plant origin and their processed forms, more preferably fruits and their processed forms, such as pomes, stone fruits, soft fruits and citrus fruits and their processed forms.

The compositions may be used by treating the fungi or the plants, plant propagation materials, such as seeds, soil, surfaces, materials or rooms to be protected from fungal attack with a fungicidally effective amount of the active substances. The application can be carried out both before and after the infection of the plants, plant propagation materials, such as seeds, soil, surfaces, materials or rooms by the fungi.

Plant propagation materials may be treated with the inventive compositions or the components thereof, respectively, prophylactically either at or before planting or transplanting.

An agrochemical composition of the invention may comprise a fungicidally effective amount of the components. The term "effective amount" denotes an amount of the inventive compositions 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. 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 compositions used.

Compositions of the invention may also be suitable for efficiently controlling arthropodal pests such as arachnids, myriapedes and insects as well as nematodes.

The present invention also provides methods for the control of insects, acarids or nematodes comprising contacting the insect, acarid or nematode or their food supply, habitat, breeding grounds or their locus with a pesticidally effective amount of the compositions or the components of the inventive compositions, respectively.

Moreover, the present invention also relates to a method of protecting plants from attack or infestation by insects, acarids or nematodes comprising contacting the plant, or the soil or

water in which the plant is growing, with a pesticidally effective amount of an inventive composition or with a pesticidally effective amount of the components of the inventive composition, respectively.

5 Particularly, the invention relates to a method for the protection of plant propagation material, preferably seeds, from soil insects and of the seedlings' roots and shoots from soil and foliar insects which comprises contacting the plant propagation material as e.g. the seeds before sowing and/or after pregermination with a pesticidally effective amount of an inventive composition or with a pesticidally effective amount of the components of the inventive composition, respectively.

10 The invention also provides seeds comprising the inventive composition or the components of the inventive composition, respectively.

Moreover, it has been found that simultaneous, that is joint or separate, application of the active compound(s) of the inventive compositions or successive application (that is immediately one after another and thereby creating the mixture "in-situ" on the desired  
15 location, as e.g. the plant) of the active compound(s) of the inventive compositions allows enhanced control of pests compared to the control rates that are possible with the individual compounds.

They may be suitable for efficiently combating the following pests:

insects from the order of Lepidoptera, for example *Achroia grisella*, *Acleris* spp. such as *A. fimbriana*, *A. gloverana*, *A. variana*; *Acrolepiopsis assectella*, *Acronicta major*, *Adoxophyes* spp. such as *A. cyrtosema*, *A. orana*; *Aedia leucomelas*, *Agrotis* spp. such as *A. exclamatoris*, *A. fucosa*, *A. ipsilon*, *A. orthogoma*, *A. segetum*, *A. subterranea*; *Alabama argillacea*, *Aleurodicus dispersus*, *Alsophila pometaria*, *Ampelophaga rubiginosa*, *Amyelois transitella*, *Anacamptis sarcitella*, *Anagasta kuehniella*, *Anarsia lineatella*, *Anisota senatoria*, *Antheraea pernyi*, *Anticarsia (=Thermesia)* spp. such as *A. gemmatalis*; *Apamea* spp., *Aproaerema modicella*, *Archips* spp. such as *A. argyrospila*, *A. fuscocupreanus*, *A. rosana*, *A. xyloseanus*; *Argyresthia conjugella*, *Argyroplote* spp., *Argyrotaenia* spp. such as *A. velutinana*; *Athetis mindara*, *Austroasca viridigrisea*, *Autographa gamma*, *Autographa nigrisigna*, *Barathra brassicae*, *Bedellia* spp., *Bonagota salubricola*, *Borbo cinnara*, *Bucculatrix thurberiella*,  
20 *Bupalus piniarius*, *Busseola* spp., *Cacoecia* spp. such as *C. murinana*, *C. podana*; *Cactoblastis cactorum*, *Cadra cautella*, *Calingo braziliensis*, *Caloptilis theivora*, *Capua reticulana*, *Carposina* spp. such as *C. niponensis*, *C. sasakii*; *Cephus* spp., *Chaetocnema aridula*, *Cheimatobia brumata*, *Chilo* spp. such as *C. Indicus*, *C. suppressalis*, *C. partellus*; *Choreutis pariana*, *Choristoneura* spp. such as *C. conflictana*, *C. fumiferana*, *C. longicellana*, *C. murinana*, *C. occidentalis*, *C. rosaceana*; *Chrysodeixis (=Pseudoplusia)* spp. such as *C. eriosoma*, *C. includens*; *Cirphis unipuncta*, *Clysia ambiguella*, *Cnaphalocerus* spp., *Cnaphalocrocis medinalis*, *Cnephasia* spp., *Cochylis hospes*, *Coleophora* spp., *Colias eurytheme*, *Conopomorpha* spp., *Conotrachelus* spp., *Copitarsia* spp., *Corcyra cephalonica*, *Crambus caliginosellus*, *Crambus teterellus*, *Crociosema (=Epinotia) aporema*, *Cydalima (=Diaphania) perspectalis*, *Cydia (=Carpocapsa)* spp. such as *C. pomonella*, *C. latiferreana*; *Dalaca noctuides*, *Datana integerrima*, *Dasychira pinicola*, *Dendrolimus* spp. such as *D. pini*, *D. spectabi-*  
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*lis, D. sibiricus; Desmia funeralis, Diaphania* spp. such as *D. nitidalis, D. hyalinata; Diatraea*  
*grandiosella, Diatraea saccharalis, Diphthera festiva, Earias* spp. such as *E. insulana, E.*  
*vittella; Ecdytolopha aurantianu, Egira (=Xylomyges) curialis, Elasmopalpus lignosellus,*  
5 *Eldana saccharina, Endopiza viteana, Ennomos subsignaria, Eoreuma loftini, Ephestia* spp.  
 such as *E. cautella, E. elutella, E. kuehniella; Epinotia aporema, Epiphyas postvittana,*  
*Erannis tiliaria, Erionota thrax, Etiella* spp., *Eulia* spp., *Eupoecilia ambiguella, Euproctis*  
*chrysorrhoea, Euxoa* spp., *Evetria bouliana, Faronta albilinea, Feltia* spp. such as *F. sub-*  
*terranean; Galleria mellonella, Gracillaria* spp., *Grapholita* spp. such as *G. funebrana, G.*  
10 *molesta, G. inopinata; Halysidota* spp., *Harrisina americana, Hedylepta* spp., *Helicoverpa*  
 spp. such as *H. armigera (=Heliothis armigera), H. zea (=Heliothis zea); Heliothis* spp. such  
 as *H. assulta, H. subflexa, H. virescens; Hellula* spp. such as *H. undalis, H. rogatalis; Heli-*  
*coverpa gelotopoeon, Hemileuca oliviae, Herpetogramma licarsisalis, Hibernia defoliaria,*  
*Hofmannophila pseudospretella, Homoeosoma electellum, Homona magnanima, Hypena*  
*scabra, Hyphantria cunea, Hyponomeuta padella, Hyponomeuta malinellus, Kakivoria*  
15 *flavofasciata, Keiferia lycopersicella, Lambdina fiscellaria fiscellaria, Lambdina fiscellaria*  
*lugubrosa, Lamprosema indicata, Laspeyresia molesta, Leguminivora glycinivorella, Lerodea*  
*eufala, Leucinodes orbonalis, Leucoma salicis, Leucoptera* spp. such as *L. coffeella, L.*  
*scitella; Leuminivora lycinivorella, Lithocolletis blancardella, Lithophane antennata, Llatia*  
*octo (=Amyna axis), Lobesia botrana, Lophocampa* spp., *Loxagrotis albicosta, Loxostege*  
20 spp. such as *L. sticticalis, L. cerealis; Lymantria* spp. such as *L. dispar, L. monacha;*  
*Lyonetia clerkella, Lyonetia prunifoliella, Malacosoma* spp. such as *M. americanum, M.*  
*californicum, M. constrictum, M. neustria; Mamestra* spp. such as *M. brassicae, M. con-*  
*figurata; Mamstra brassicae, Manduca* spp. such as *M. quinquemaculata, M. sexta;*  
*Marasmia* spp, *Marmara* spp., *Maruca testulalis, Megalopyge lanata, Melanchra picta,*  
25 *Melanitis leda, Mocis* spp. such as *M. lapites, M. repanda; Mocis latipes, Monochroa*  
*fragariae, Mythimna separata, Nemapogon cloacella, Neoleucinodes elegantalis, Nepytia*  
 spp., *Nymphula* spp., *Oiketicus* spp., *Omiodes indicata, Omphisa anastomosalis, Operoph-*  
*tera brumata, Orgyia pseudotsugata, Oria* spp., *Orthaga thyrisalis, Ostrinia* spp. such as *O.*  
*nubilalis; Oulema oryzae, Paleacrita vernata, Panolis flammea, Parnara* spp., *Papaipema*  
30 *nebris, Papilio cresphontes, Paramyelois transitella, Paranthrene regalis, Paysandisia ar-*  
*chon, Pectinophora* spp. such as *P. gossypiella; Peridroma saucia, Perileucoptera* spp., such  
 as *P. coffeella; Phalera bucephala, Phryganidia californica, Phthorimaea* spp. such as *P.*  
*operculella; Phyllocnistis citrella, Phyllonorycter* spp. such as *P. blancardella, P. crataegella,*  
*P. issikii, P. ringoniella; Pieris* spp. such as *P. brassicae, P. rapae, P. napi; Pilocrocis*  
35 *tripunctata, Plathypena scabra, Platynota* spp. such as *P. flavedana, P. idaeusalis, P. stul-*  
*tana; Platyptilia carduidactyla, Plebejus argus, Plodia interpunctella, Plusia* spp, *Plutella*  
*maculipennis, Plutella xylostella, Pontia protodica, Prays* spp., *Prodenia* spp., *Proxenus*  
*lepigone, Pseudaletia* spp. such as *P. sequax, P. unipuncta; Pyrausta nubilalis, Rachiplusia*  
*nu, Richia albicosta, Rhizobius ventralis, Rhyacionia frustrana, Sabulodes aegrotata, Schizu-*  
40 *ra concinna, Schoenobius* spp., *Schreckensteinia festaliella, Scirpophaga* spp. such as *S.*  
*incertulas, S. innotata; Scotia segetum, Sesamia* spp. such as *S. inferens, Seudyra subflava,*  
*Sitotroga cerealella, Sparganothis pilleriana, Spilonota lechriaspis, S. ocellana, Spodoptera*  
 (=Lamphygma) spp. such as *S. eridania, S. exigua, S. frugiperda, S. latifascia, S. littoralis,*

- S. litura*, *S. omithogalli*; *Stigmella* spp., *Stomopteryx subsecivella*, *Strymon bazochii*, *Sylepta derogata*, *Synanthedon* spp. such as *S. exitiosa*, *Tecia solanivora*, *Telehin licus*, *Thaumato-poea pityocampa*, *Thaumatotibia (=Cryptophlebia) leucotreta*, *Thaumatopoea pityocampa*, *Thecla* spp., *Theresimima ampelophaga*, *Thyrinteina* spp., *Tieldenia inconspicuella*, *Tinea* spp.
- 5 such as *T. cloacella*, *T. pellionella*; *Tineola bisselliella*, *Tortrix* spp. such as *T. viridana*; *Trichophaga tapetzella*, *Trichoplusia* spp. such as *T. ni*; *Tuta (=Scrobipalpula) absoluta*, *Udea* spp. such as *U. rubigalis*, *U. rubigalis*; *Virachola* spp., *Yponomeuta padella*, and *Zeiraphera canadensis*;
- insects from the order of Coleoptera, for example *Acalymma vittatum*, *Acanthoscehdes obtectus*, *Adoretus* spp., *Agelastica alni*, *Agrilus* spp. such as *A. anxius*, *A. planipennis*, *A. sinuatus*; *Agriotes* spp. such as *A. fuscicollis*, *A. lineatus*, *A. obscurus*; *Alphitobius diaperinus*, *Amphimallus solstitialis*, *Anisandrus dispar*, *Anisoplia austriaca*, *Anobium punctatum*, *Anomala corpulenta*, *Anomala rufocuprea*, *Anoplophora* spp. such as *A. glabripennis*; *Anthonomus* spp. such as *A. eugenii*, *A. grandis*, *A. pomorum*; *Anthrenus* spp., *Aphthona euphoridae*, *Apion* spp., *Apogonia* spp., *Athous haemorrhoidalis*, *Atomaria* spp. such as *A. linearis*; *Attagenus* spp., *Aulacophora femoralis*, *Blastophagus piniperda*, *Blitophaga undata*, *Bruchidius obtectus*, *Bruchus* spp. such as *B. lentis*, *B. pisorum*, *B. rufimanus*; *Byctiscus betulae*, *Callidiellum rufipenne*, *Calloplistria floridensis*, *Callosobruchus chinensis*, *Cameraria ohridella*, *Cassida nebulosa*, *Cerotoma trifurcata*, *Cetonia aurata*, *Ceuthorhynchus* spp. such as *C. assimilis*, *C. napi*; *Chaetocnema tibialis*, *Cleonus mendicus*, *Conoderus* spp. such as *C. vespertinus*; *Conotrachelus nenuphar*, *Cosmopolites* spp., *Costelytra zealandica*, *Crioceris asparagi*, *Cryptolestes ferrugineus*, *Cryptorhynchus lapathi*, *Ctenicera* spp. such as *C. destructor*; *Curculio* spp., *Cylindrocopturus* spp., *Cyclocephala* spp., *Dactylispa balyi*, *Dectes texanus*, *Dermestes* spp., *Diabrotica* spp. such as *D. undecimpunctata*, *D. speciosa*, *D. longicornis*, *D. semipunctata*, *D. virgifera*; *Diaprepes abbreviatus*, *Dichocrocis* spp., *Dicladispa armigera*, *Diloboderus abderus*, *Diocalandra frumenti (Diocalandra stigmaticollis)*, *Enaphalodes rufulus*, *Epilachna* spp. such as *E. varivestis*, *E. vigintioctomaculata*; *Epitrix* spp. such as *E. hirtipennis*, *E. similaris*; *Eutheola humilis*, *Eutinobothrus brasiliensis*, *Faustinus cubae*, *Gibbium psylloides*, *Gnathocerus cornutus*, *Hellula undalis*, *Heteronychus arator*, *Hylamorpha elegans*, *Hylobius abietis*, *Hylotrupes bajulus*, *Hypera* spp. such as *H. brunneipennis*, *H. postica*; *Hypomeces squamosus*, *Hypothenemus* spp., *Ips typographus*, *Lachnosterna consanguinea*, *Lasioderma serricorne*, *Latheticus oryzae*, *Lathridius* spp., *Lema* spp. such as *L. bilineata*, *L. melanopus*; *Leptinotarsa* spp. such as *L. decemlineata*; *Leptispa pygmaea*, *Limonius californicus*, *Lissorhoptrus oryzophilus*, *Lixus* spp., *Luperodes* spp., *Lyctus* spp. such as *L. brunneus*; *Liogenys fuscus*, *Macroductylus* spp. such as *M. subspinosus*; *Maladera matrida*, *Megaplatus mutates*, *Megascelis* spp., *Melanotus communis*, *Meligethes* spp. such as *M. aeneus*; *Melolontha* spp. such as *M. hippocastani*, *M. melolontha*; *Metamasius hemipterus*, *Microtheca* spp., *Migdolus* spp. such as *M. fryanus*, *Monochamus* spp. such as *M. alternatus*; *Naupactus xanthographus*, *Niptus hololeucus*, *Oberia brevis*, *Oemona hirta*, *Oryctes rhinoceros*, *Oryzaephilus surinamensis*, *Oryzaphagus oryzae*, *Otiorrhynchus sulcatus*, *Otiorrhynchus ovatus*, *Otiorrhynchus sulcatus*, *Oulema melanopus*, *Oulema oryzae*, *Oxycetonia jucunda*, *Phaedon* spp. such as *P. brassicae*, *P. cochleariae*; *Phoracantha recurva*, *Phyllobius pyri*, *Phyllopertha horticola*, *Phyllophaga* spp. such as *P.*

*helleri*; *Phyllotreta* spp. such as *P. chrysocephala*, *P. nemorum*, *P. striolata*, *P. vittula*;  
*Phyllopertha horticola*, *Popillia japonica*, *Premnotrypes* spp., *Psacotha hilaris*, *Psylliodes*  
*chrysocephala*, *Prostephanus truncates*, *Psylliodes* spp., *Ptinus* spp., *Pulga saltona*, *Rhizo-*  
5 *pertha dominica*, *Rhynchophorus* spp. such as *R. billineatus*, *R. ferrugineus*, *R. palmarum*,  
*R. phoenicis*, *R. vulneratus*; *Saperda candida*, *Scolytus schevyrewi*, *Scyphophorus acupunc-*  
*tatus*, *Sitona lineatus*, *Sitophilus* spp. such as *S. granaria*, *S. oryzae*, *S. zeamais*; *Spheno-*  
*phorus* spp. such as *S. levis*; *Stegobium paniceum*, *Sternechus* spp. such as *S. subsignatus*;  
*Strophomorphus ctenotus*, *Symphyletes* spp., *Tanymecus* spp., *Tenebrio molitor*, *Tene-*  
10 *brioides mauretanicus*, *Tribolium* spp. such as *T. castaneum*; *Trogoderma* spp., *Tychius*  
spp., *Xylotrechus* spp. such as *X. pyrrhoderus*; and, *Zabrus* spp. such as *Z. tenebrioides*;  
insects from the order of Diptera for example *Aedes* spp. such as *A. aegypti*, *A. albopictus*,  
*A. vexans*; *Anastrepha ludens*, *Anopheles* spp. such as *A. albimanus*, *A. crucians*, *A.*  
*freeborni*, *A. gambiae*, *A. leucosphyrus*, *A. maculipennis*, *A. minimus*, *A. quadrimaculatus*, *A.*  
15 *sinensis*; *Bactrocera invadens*, *Bibio hortulanus*, *Calliphora erythrocephala*, *Calliphora vicina*,  
*Ceratitis capitata*, *Chrysomyia* spp. such as *C. bezziana*, *C. hominivorax*, *C. macellaria*;  
*Chrysops atlanticus*, *Chrysops discalis*, *Chrysops silacea*, *Cochliomyia* spp. such as *C.*  
*hominivorax*; *Contarinia* spp. such as *C. sorghicola*; *Cordylobia anthropophaga*, *Culex* spp.  
such as *C. nigripalpus*, *C. pipiens*, *C. quinquefasciatus*, *C. tarsalis*, *C. tritaeniorhynchus*;  
20 *Culicoides furens*, *Culiseta inornata*, *Culiseta melanura*, *Cuterebra* spp., *Dacus cucurbitae*,  
*Dacus oleae*, *Dasineura brassicae*, *Dasineura oxycoccana*, *Delia* spp. such as *D. antique*, *D.*  
*coarctata*, *D. platura*, *D. radicum*; *Dermatobia hominis*, *Drosophila* spp. such as *D. suzukii*,  
*Fannia* spp. such as *F. canicularis*; *Gastrophilus* spp. such as *G. intestinalis*; *Geomyza*  
*tipunctata*, *Glossina* spp. such as *G. fuscipes*, *G. morsitans*, *G. palpalis*, *G. tachinoides*;  
25 *Haematobia irritans*, *Haplodiplosis equestris*, *Hippelates* spp., *Hylemyia* spp. such as *H.*  
*platura*; *Hypoderma* spp. such as *H. lineata*; *Hyppobosca* spp., *Hydrellia philippina*,  
*Leptoconops torrens*, *Liriomyza* spp. such as *L. sativae*, *L. trifolii*; *Lucilia* spp. such as *L.*  
*caprina*, *L. cuprina*, *L. sericata*; *Lycoria pectoralis*, *Mansonina titillanus*, *Mayetiola* spp. such  
as *M. destructor*; *Musca* spp. such as *M. autumnalis*, *M. domestica*; *Muscina stabulans*,  
30 *Oestrus* spp. such as *O. ovis*; *Opomyza florum*, *Oscinella* spp. such as *O. frit*; *Orseolia*  
*oryzae*, *Pegomya hysocyami*, *Phlebotomus argentipes*, *Phorbia* spp. such as *P. antiqua*, *P.*  
*brassicae*, *P. coarctata*; *Phytomyza gymnostoma*, *Prosimulium mixtum*, *Psila rosae*,  
*Psorophora columbiae*, *Psorophora discolor*, *Rhagoletis* spp. such as *R. cerasi*, *R. cingulate*,  
*R. indifferens*, *R. mendax*, *R. pomonella*; *Rivellia quadrifasciata*, *Sarcophaga* spp. such as *S.*  
*haemorrhoidalis*; *Simulium vittatum*, *Sitodiplosis mosellana*, *Stomoxys* spp. such as *S.*  
35 *calcitrans*; *Tabanus* spp. such as *T. atratus*, *T. bovinus*, *T. lineola*, *T. similis*; *Tannia* spp.,  
*Thecodiplosis japonensis*, *Tipula oleracea*, *Tipula paludosa*, and *Wohlfahrtia* spp;  
insects from the order of Thysanoptera for example, *Baliothrips biformis*, *Dichromothrips*  
*corbettii*, *Dichromothrips* ssp., *Echinothrips americanus*, *Enneothrips flavens*, *Frankliniella*  
spp. such as *F. fusca*, *F. occidentalis*, *F. tritici*; *Heliothrips* spp., *Hercinothrips femoralis*,  
40 *Kakothrips* spp., *Microcephalothrips abdominalis*, *Neohydatothrips samayunkur*, *Pezothrips*  
*kellyanus*, *Rhipiphorotheis cruentatus*, *Scirtothrips* spp. such as *S. citri*, *S. dorsalis*, *S.*

*perseae*; *Stenchaetothrips* spp, *Taeniothrips cardamoni*, *Taeniothrips inconsequens*, *Thrips* spp. such as *T. imagines*, *T. hawaiiensis*, *T. oryzae*, *T. palmi*, *T. parvispinus*, *T. tabaci*;

insects from the order of Hemiptera for example, *Acizzia jamatonica*, *Acrosternum* spp. such as *A. hilare*; *Acyrtosiphon* spp. such as *A. onobrychis*, *A. pisum*; *Adelges laricis*, *Adelges*  
 5 *tsugae*, *Adelphocoris* spp., such as *A. rapidus*, *A. superbus*; *Aeneolamia* spp., *Agonosцена* spp., *Aulacorthum solani*, *Aleurocanthus woglumi*, *Aleurodes* spp., *Aleurodicus disperses*,  
*Aleurolobus barodensis*, *Aleurothrixus* spp., *Amrasca* spp., *Anasa tristis*, *Antestiopsis* spp.,  
*Anuraphis cardui*, *Aonidiella* spp., *Aphanostigma piri*, *Aphidula nasturtii*, *Aphis* spp. such as  
 10 *A. craccivora*, *A. fabae*, *A. forbesi*, *A. gossypii*, *A. grossulariae*, *A. maidiradicis*, *A. pomi*, *A. sambuci*, *A. schneideri*, *A. spiraecola*; *Arboridia apicalis*, *Arilus critatus*, *Aspidiella* spp.,  
*Aspidiotus* spp., *Atanus* spp., *Aulacaspis yasumatsui*, *Aulacorthum solani*, *Bactericera*  
*cockerelli* (*Paratrioza cockerelli*), *Bemisia* spp. such as *B. argentifolii*, *B. tabaci* (*Aleurodes*  
*tabaci*); *Blissus* spp. such as *B. leucopterus*; *Brachycaudus* spp. such as *B. cardui*, *B. heli-*  
 15 *chrysi*, *B. persicae*, *B. prunicola*; *Brachycolus* spp., *Brachycorynella asparagi*, *Brevicoryne*  
*brassicae*, *Cacopsylla* spp. such as *C. fulguralis*, *C. pyricola* (*Psylla piri*); *Calligypona margi-*  
*nata*, *Calocoris* spp., *Campylomma livida*, *Capitophorus horni*, *Carneocephala fulgida*, *Cave-*  
*lerius* spp., *Ceraplastes* spp., *Ceratovacuna lanigera*, *Ceroplastes ceriferus*, *Cerosipha*  
*gossypii*, *Chaetosiphon fragaefolii*, *Chionaspis tegalensis*, *Chlorita onukii*, *Chromaphis ju-*  
 20 *glandicola*, *Chrysomphalus ficus*, *Cicadulina mbila*, *Cimex* spp. such as *C. hemipterus*, *C.*  
*lectularius*; *Coccoxymylus halli*, *Coccus* spp. such as *C. hesperidum*, *C. pseudomagnoliarum*,  
*Corythucha arcuata*, *Creontiades dilutus*, *Cryptomyzus ribis*, *Chrysomphalus aonidum*, *Cryp-*  
*tomyzus ribis*, *Ctenarytaina spatulata*, *Cyrtopeltis notatus*, *Dalbulus* spp., *Dasynus piperis*,  
*Dialeurodes* spp. such as *D. citrifolii*; *Dalbulus maidis*, *Diaphorina* spp. such as *D. citri*; *Dias-*  
 25 *pis* spp. such as *D. bromelliae*; *Dichelops furcatus*, *Diconocoris hewetti*, *Doralis* spp., *Drey-*  
*fusia nordmanniana*, *Dreyfusia piceae*, *Drosicha* spp., *Dysaphis* spp. such as *D. plantagi-*  
*nea*, *D. pyri*, *D. radicola*; *Dysaulacorthum pseudosolani*, *Dysdercus* spp. such as *D. cingula-*  
*tus*, *D. intermedius*; *Dysmicoccus* spp., *Edessa* spp., *Geocoris* spp., *Empoasca* spp. such as  
 30 *E. fabae*, *E. solana*; *Epidiaspis leperii*, *Eriosoma* spp. such as *E. lanigerum*, *E. pyricola*;  
*Erythroneura* spp., *Eurygaster* spp. such as *E. integriceps*; *Euscelis bilobatus*, *Euschistus*  
 spp. such as *E. heros*, *E. impictiventris*, *E. servus*; *Fiorinia theae*, *Geococcus coffeae*, *Gly-*  
*caspis brimblecombei*, *Halyomorpha* spp. such as *H. halys*; *Heliopeltis* spp., *Homalodisca*  
*vitripennis* (= *H. coagulata*), *Horcias nobilellus*, *Hyalopterus pruni*, *Hyperomyzus lactucae*,  
 35 *Icerya* spp. such as *I. purchase*; *Idiocerus* spp., *Idioscopus* spp., *Laodelphax striatellus*,  
*Lecanium* spp., *Lecanoideus floccissimus*, *Lepidosaphes* spp. such as *L. ulmi*; *Leptocoris*  
 spp., *Leptoglossus phyllopus*, *Lipaphis erysimi*, *Lygus* spp. such as *L. hesperus*, *L. lineolaris*,  
*L. pratensis*; *Maconelliococcus hirsutus*, *Marchalina hellenica*, *Macropes excavatus*, *Macro-*  
*siphum* spp. such as *M. rosae*, *M. avenae*, *M. euphorbiae*; *Macrosteles quadrilineatus*, *Ma-*  
*hanarva fimbriolata*, *Megacocta cribraria*, *Megoura viciae*, *Melanaphis pyriarius*, *Melanaphis*  
*sacchari*, *Melanocallis* (= *Tinocallis*) *caryaefoliae*, *Metcafiella* spp., *Metopolophium dirhodum*,  
 40 *Monellia costalis*, *Monelliopsis pecanis*, *Myzocallis coryli*, *Murgantia* spp., *Myzus* spp. such  
 as *M. ascalonicus*, *M. cerasi*, *M. nicotianae*, *M. persicae*, *M. varians*; *Nasonovia ribis-nigri*,  
*Neotoxoptera formosana*, *Neomegalotomus* spp, *Nephotettix* spp. such as *N. malayanus*, *N.*  
*nigropictus*, *N. parvus*, *N. virescens*; *Nezara* spp. such as *N. viridula*; *Nilaparvata lugens*,

*Nysius huttoni*, *Oebalus* spp. such as *O. pugnax*; *Oncometopia* spp., *Orthezia praelonga*,  
*Oxycaraenus hyalinipennis*, *Parabemisia myricae*, *Parlatoria* spp., *Parthenolecanium* spp.  
such as *P. corni*, *P. persicae*; *Pemphigus* spp. such as *P. bursarius*, *P. populivenae*; *Pere-*  
5 *grinus maidis*, *Perkinsiella saccharicida*, *Phenacoccus* spp. such as *P. aceris*, *P. gossypii*;  
*Phloeomyzus passerinii*, *Phorodon humuli*, *Phylloxera* spp. such as *P. devastatrix*, *Piesma*  
*quadrata*, *Piezodorus* spp. such as *P. guildinii*; *Pinnaspis aspidistrae*, *Planococcus* spp. such  
as *P. citri*, *P. ficus*; *Prosapia bicincta*, *Protopulvinaria pyriformis*, *Psallus seriatus*, *Pseuda-*  
10 *cysta perseae*, *Pseudaulacaspis pentagona*, *Pseudococcus* spp. such as *P. comstocki*; *Psylla*  
spp. such as *P. mali*; *Pteromalus* spp., *Pulvinaria amygdali*, *Pyrilla* spp., *Quadraspidotus*  
spp., such as *Q. perniciosus*; *Quesada gigas*, *Rastrococcus* spp., *Reduvius senilis*, *Rhizo-*  
15 *ecus americanus*, *Rhodnius* spp., *Rhopalomyzus ascalonicus*, *Rhopalosiphum* spp. such as  
*R. pseudobrassicas*, *R. insertum*, *R. maidis*, *R. padi*; *Sagatodes* spp., *Sahlbergella singu-*  
*laris*, *Saissetia* spp., *Sappaphis mala*, *Sappaphis mali*, *Scaptocoris* spp., *Scaphoides titanus*,  
*Schizaphis graminum*, *Schizoneura lanuginosa*, *Scotinophora* spp., *Selenaspis articulatus*,  
20 *Sitobion avenae*, *Sogata* spp., *Sogatella furcifera*, *Solubea insularis*, *Spissistilus festinus*  
(=*Stictocephala festina*), *Stephanitis nashi*, *Stephanitis pyrioides*, *Stephanitis takeyai*,  
*Tenalaphara malayensis*, *Tetraleurodes perseae*, *Therioaphis maculate*, *Thyanta* spp. such  
as *T. accerra*, *T. perditor*; *Tibraca* spp., *Tomaspis* spp., *Toxoptera* spp. such as *T. aurantii*;  
*Trialeurodes* spp. such as *T. abutilonea*, *T. ricini*, *T. vaporariorum*; *Triatoma* spp., *Trioza*  
30 spp., *Typhlocyba* spp., *Unaspis* spp. such as *U. citri*, *U. yanonensis*; and *Viteus vitifolii*,

Insects from the order Hymenoptera for example *Acanthomyops interjectus*, *Athalia rosae*,  
*Atta* spp. such as *A. capiguara*, *A. cephalotes*, *A. cephalotes*, *A. laevigata*, *A. robusta*, *A.*  
*sexdens*, *A. texana*, *Bombus* spp., *Brachymyrmex* spp., *Camponotus* spp. such as *C. flori-*  
25 *danus*, *C. pennsylvanicus*, *C. modoc*; *Cardiocondyla nuda*, *Chalibion* sp, *Crematogaster*  
spp., *Dasymutilla occidentalis*, *Diprion* spp., *Dolichovespula maculata*, *Dorymyrmex* spp.,  
*Dryocosmus kuriphilus*, *Formica* spp., *Hoplocampa* spp. such as *H. minuta*, *H. testudinea*;  
*Iridomyrmex humilis*, *Lasius* spp. such as *L. niger*, *Linepithema humile*, *Liometopum* spp.,  
*Leptocybe invasa*, *Monomorium* spp. such as *M. pharaonis*, *Monomorium*, *Nylandria fulva*,  
30 *Pachycondyla chinensis*, *Paratrechina longicornis*, *Paravespula* spp., such as *P. germanica*,  
*P. pennsylvanica*, *P. vulgaris*; *Pheidole* spp. such as *P. megacephala*; *Pogonomyrmex* spp.  
such as *P. barbatus*, *P. californicus*, *Polistes rubiginosa*, *Prenolepis imparis*, *Pseudomyrmex*  
*gracilis*, *Schelipron* spp., *Sirex cyaneus*, *Solenopsis* spp. such as *S. geminata*, *S. invicta*, *S.*  
*molesta*, *S. richteri*, *S. xyloni*, *Sphecius speciosus*, *Sphex* spp., *Tapinoma* spp. such as *T.*  
35 *melanocephalum*, *T. sessile*; *Tetramorium* spp. such as *T. caespitum*, *T. bicarinatum*, *Vespa*  
spp. such as *V. crabro*; *Vespula* spp. such as *V. squamosal*; *Wasmannia auropunctata*,  
*Xylocopa* sp;

Insects from the order Orthoptera for example *Acheta domesticus*, *Calliptamus italicus*,  
*Chortoicetes terminifera*, *Ceuthophilus* spp., *Diastrammena asynamora*, *Dociostaurus*  
*maroccanus*, *Gryllotalpa* spp. such as *G. africana*, *G. gryllotalpa*; *Gryllus* spp., *Hieroglyphus*  
40 *daganensis*, *Kraussaria angulifera*, *Locusta* spp. such as *L. migratoria*, *L. pardalina*;  
*Melanoplus* spp. such as *M. bivittatus*, *M. femurrubrum*, *M. mexicanus*, *M. sanguinipes*, *M.*  
*spretus*; *Nomadacris septemfasciata*, *Oedaleus senegalensis*, *Scapteriscus* spp.,

*Schistocerca* spp. such as *S. americana*, *S. gregaria*, *Stemopelmatus* spp., *Tachycines asynamorus*, and *Zonozerus variegatus*;

Pests from the Class Arachnida for example Acari, e.g. of the families Argasidae, Ixodidae and Sarcoptidae, such as *Amblyomma* spp. (e.g. *A. americanum*, *A. variegatum*, *A. maculatum*), Argas spp. such as *A. persicu*), *Boophilus* spp. such as *B. annulatus*, *B. decoloratus*, *B. microplus*, *Dermacentor* spp. such as *D. silvarum*, *D. andersoni*, *D. variabilis*, *Hyalomma* spp. such as *H. truncatum*, *Ixodes* spp. such as *I. ricinus*, *I. rubicundus*, *I. scapularis*, *I. holocyclus*, *I. pacificus*, *Rhipicephalus sanguineus*, *Ornithodoros* spp. such as *O. moubata*, *O. hermsi*, *O. turicata*, *Ornithonyssus bacoti*, *Otobius megnini*, *Dermanyssus gallinae*, *Psoroptes* spp. such as *P. ovis*, *Rhipicephalus* spp. such as *R. sanguineus*, *R. appendiculatus*, *Rhipicephalus evertsi*, *Rhizoglyphus* spp., *Sarcoptes* spp. such as *S. Scabiei*; and Family Eriophyidae including *Aceria* spp. such as *A. sheldoni*, *A. anthocoptes*, *Acallitus* spp., *Aculops* spp. such as *A. lycopersici*, *A. pelekassi*, *Aculus* spp. such as *A. schlechtendali*; *Colomerus vitis*, *Epitrimerus pyri*, *Phyllocoptruta oleivora*; *Eriophytes ribis* and *Eriophyes* spp. such as *Eriophyes sheldoni*; Family Tarsonemidae including *Hemitarsonemus* spp., *Phytonemus pallidus* and *Polyphagotarsonemus latus*, *Stenotarsonemus* spp. *Steneotarsonemus spinki*; Family Tenuipalpidae including *Brevipalpus* spp. such as *B. phoenicis*; Family Tetranychidae including *Eotetranychus* spp., *Eutetranychus* spp., *Oligonychus* spp., *Petrobia latens*, *Tetranychus* spp. such as *T. cinnabarinus*, *T. evansi*, *T. kanzawai*, *T. pacificus*, *T. phaseolus*, *T. telarius* and *T. urticae*; *Bryobia praetiosa*; *Panonychus* spp. such as *P. ulmi*, *P. citri*, *Metatetranychus* spp. and *Oligonychus* spp. such as *O. pratensis*, *O. perseae*, *Vasates lycopersici*, *Raoiella indica*, Family Carpoglyphidae including *Carpoglyphus* spp.; *Pentatheleidae* spp. such as *Halotydeus destructor*; Family Demodicidae with species such as *Demodex* spp.; Family Trombicidae including *Trombicula* spp.; Family Macronyssidae including *Ornithonyssus* spp.; Family Pyemotidae including *Pyemotes tritici*, *Tyrophagus putrescentiae*; Family Acaridae including *Acarus siro*; Family Araneida including *Latrodectus mactans*, *Tegenaria agrestis*, *Chiracanthium sp*, *Lycosa sp* *Achaearanea tepidariorum* and *Loxosceles reclusa*;

Pests from the Phylum Nematoda, for example, plant parasitic nematodes such as root-knot nematodes, *Meloidogyne* spp. such as *M. hapla*, *M. incognita*, *M. javanica*; cyst-forming nematodes, *Globodera* spp. such as *G. rostochiensis*; *Heterodera* spp. such as *H. avenae*, *H. glycines*, *H. schachtii*, *H. trifolii*; Seed gall nematodes, *Anguina* spp.; Stem and foliar nematodes, *Aphelenchoides* spp. such as *A. besseyi*; Sting nematodes, *Belonolaimus* spp. such as *B. longicaudatus*; Pine nematodes, *Bursaphelenchus* spp. such as *B. lignicolus*, *B. xylophilus*; Ring nematodes, *Criconema* spp., *Criconemella* spp. such as *C. xenoplax* and *C. ornata*; and, *Criconemoides* spp. such as *Criconemoides informis*; *Mesocriconema* spp.; Stem and bulb nematodes, *Ditylenchus* spp. such as *D. destructor*, *D. dipsaci*; Awl nematodes, *Dolichodorus* spp.; Spiral nematodes, *Helicocotlenchus multincinctus*; Sheath and sheathoid nematodes, *Hemicycliophora* spp. and *Hemicriconemoides* spp.; *Hirshmanniella* spp.; Lance nematodes, *Hoploaimus* spp.; False rootknot nematodes, *Nacobbus* spp.; Needle nematodes, *Longidorus* spp. such as *L. elongatus*; Lesion nematodes, *Pratylenchus* spp. such as *P. brachyurus*, *P. neglectus*, *P. penetrans*, *P. curviturus*, *P. goodeyi*; Burrowing

nematodes, *Radopholus* spp. such as *R. similis*; *Rhadopholus* spp.; *Rhodopholus* spp.; Reniform nematodes, *Rotylenchus* spp. such as *R. robustus*, *R. reniformis*; *Scutellonema* spp.; Stubby-root nematode, *Trichodorus* spp. such as *T. obtusus*, *T. primitivus*; *Paratrichodorus* spp. such as *P. minor*; Stunt nematodes, *Tylenchorhynchus* spp. such as *T. claytoni*, *T. dubius*; Citrus nematodes, *Tylenchulus* spp. such as *T. semipenetrans*; Dagger nematodes, *Xiphinema* spp.; and other plant parasitic nematode species;

Insects from the order Isoptera for example *Calotermes flavicollis*, *Coptotermes* spp. such as *C. formosanus*, *C. gestroi*, *C. acinaciformis*; *Cornitermes cumulans*, *Cryptotermes* spp. such as *C. brevis*, *C. cavifrons*; *Globitermes sulfureus*, *Heterotermes* spp. such as *H. aureus*, *H. longiceps*, *H. tenuis*; *Leucotermes flavipes*, *Odontotermes* spp., *Incisitermes* spp. such as *I. minor*, *I. Snyder*, *Marginitermes hubbardi*, *Mastotermes* spp. such as *M. darwiniensis* *Neocapritermes* spp. such as *N. opacus*, *N. parvus*; *Neotermes* spp., *Procornitermes* spp., *Zootermopsis* spp. such as *Z. angusticollis*, *Z. nevadensis*, *Reticulitermes* spp. such as *R. hesperus*, *R. tibialis*, *R. speratus*, *R. flavipes*, *R. grassei*, *R. lucifugus*, *R. santonensis*, *R. virginicus*; *Termes natalensis*,

Insects from the order Blattaria for example *Blatta* spp. such as *B. orientalis*, *B. lateralis*; *Blattella* spp. such as *B. asahinae*, *B. germanica*; *Leucophaea maderae*, *Panchlora nivea*, *Periplaneta* spp. such as *P. americana*, *P. australasiae*, *P. brunnea*, *P. fuliginosa*, *P. japonica*; *Supella longipalpa*, *Parcoblatta pennsylvanica*, *Eurycotis floridana*, *Pycnoscelus surinamensis*,

Insects from the order Siphonoptera for example *Cediopsylla simplex*, *Ceratophyllus* spp., *Ctenocephalides* spp. such as *C. felis*, *C. canis*, *Xenopsylla cheopis*, *Pulex irritans*, *Trichodectes canis*, *Tunga penetrans*, and *Nosopsyllus fasciatus*,

Insects from the order Thysanura for example *Lepisma saccharina*, *Ctenolepisma urbana*, and *Thermobia domestica*,

Pests from the class Chilopoda for example *Geophilus* spp., *Scutigera* spp. such as *Scutigera coleoptrata*;

Pests from the class Diplopoda for example *Blaniulus guttulatus*, *Julus* spp., *Narceus* spp.,

Pests from the class Symphyla for example *Scutigera immaculata*,

Insects from the order Dermaptera, for example *Forficula auricularia*,

Insects from the order Collembola, for example *Onychiurus* spp., such as *Onychiurus armatus*,

Pests from the order Isopoda for example, *Armadillidium vulgare*, *Oniscus asellus*, *Porcellio scaber*,

Insects from the order Phthiraptera, for example *Damalinea* spp., *Pediculus* spp. such as *Pediculus humanus capitis*, *Pediculus humanus corporis*, *Pediculus humanus humanus*; *Pthirus pubis*, *Haematopinus* spp. such as *Haematopinus eurytenuis*, *Haematopinus suis*; *Linognathus* spp. such as *Linognathus vituli*; *Bovicola bovis*, *Menopon gallinae*, *Menacanthus stramineus* and *Solenopotes capillatus*, *Trichodectes* spp.,

Examples of further pest species which may be controlled by mixtures of the invention include: from the Phylum Mollusca, class Bivalvia, for example, *Dreissena* spp.; class Gastropoda, for example, *Arion* spp., *Biomphalaria* spp., *Bulinus* spp., *Deroceras* spp., *Galba* spp., *Lymnaea* spp., *Oncomelania* spp., *Pomacea canaliclata*, *Succinea* spp.; from the class of the helminths, for example, *Ancylostoma duodenale*, *Ancylostoma ceylanicum*,  
 5 *Ancylostoma braziliensis*, *Ancylostoma* spp., *Ascaris lubricoides*, *Ascaris* spp., *Brugia malayi*, *Brugia timori*, *Bunostomum* spp., *Chabertia* spp., *Clonorchis* spp., *Cooperia* spp., *Dicrocoelium* spp., *Dictyocaulus filaria*, *Diphyllbothrium latum*, *Dracunculus medinensis*,  
 10 *Echinococcus granulosus*, *Echinococcus multilocularis*, *Enterobius vermicularis*, *Faciola* spp., *Haemonchus* spp. such as *Haemonchus contortus*; *Heterakis* spp., *Hymenolepis nana*, *Hyostromgulus* spp., *Loa Loa*, *Nematodirus* spp., *Oesophagostomum* spp., *Opisthorchis* spp., *Onchocerca volvulus*, *Ostertagia* spp., *Paragonimus* spp., *Schistosomen* spp., *Strongyloides fuelleborni*, *Strongyloides stercora lis*, *Strongyloides* spp., *Taenia saginata*, *Taenia solium*,  
 15 *Trichinella spiralis*, *Trichinella nativa*, *Trichinella britovi*, *Trichinella nelsoni*, *Trichinella pseudopsiralis*, *Trichostrongulus* spp., *Trichuris trichuria*, *Wuchereria bancrofti*.

The animal pest, i.e. the insects, arachnids and nematodes, the plant, soil or water in which the plant is growing can be contacted with the inventive compositions or the components thereof, respectively, by any application method known in the art. As such, "contacting"  
 20 includes both direct contact (applying the compounds/compositions directly on the animal pest or plant - typically to the foliage, stem or roots of the plant) and indirect contact (applying the compounds/compositions to the locus of the animal pest or plant).

The inventive compositions may be used to protect growing plants and crops from attack or infestation by animal pests, especially insects, acaridae or arachnids by contacting the plant/crop with a pesticidally effective amount of the compositions or the components thereof,  
 25 respectively. The term "crop" refers both to growing and harvested crops.

The inventive compositions may particularly be important in the control of a multitude of insects on various cultivated plants, such as cereal, root crops, oil crops, vegetables, spices, ornamentals, for example seed of durum and other wheat, barley, oats, rye, maize (fodder  
 30 maize and sugar maize / sweet and field corn), soybeans, oil crops, crucifers, cotton, sunflowers, bananas, rice, oilseed rape, turnip rape, sugarbeet, fodder beet, eggplants, potatoes, grass, lawn, turf, fodder grass, tomatoes, leeks, pumpkin/squash, cabbage, iceberg lettuce, pepper, cucumbers, melons, Brassica species, melons, beans, peas, garlic, onions, carrots, tuberous plants such as potatoes, sugar cane, tobacco, grapes, petunias, geranium/pelargoniums, pansies and impatiens.

The compositions of the present invention may be employed by treating the insects or the plants, plant propagation materials, such as seeds, soil, surfaces, materials or rooms to be  
 35 protected from insecticidal attack with an insecticidally effective amount of the active compounds. The application can be carried out both before and after the infection of the plants, plant propagation materials, such as seeds, soil, surfaces, materials or rooms by the  
 40 insects.

The present invention also includes a method of combating animal pests which comprises contacting the animal pests, their habit, breeding ground, food supply, cultivated plants, seed, soil, area, material or environment in which the animal pests are growing or may grow, or the materials, plants, seeds, soils, surfaces or spaces to be protected from animal attack or infestation with a pesticidally effective amount of an inventive composition.

Moreover, animal pests may be controlled by contacting the target pest, its food supply, habitat, breeding ground or its locus with a pesticidally effective amount of the inventive compositions. As such, the application may be carried out before or after the infection of the locus, growing crops, or harvested crops by the pest.

The compositions of the invention can also be applied preventively to places at which occurrence of the pests is expected.

The compositions may be also used to protect growing plants from attack or infestation by pests by contacting the plant with a pesticidally effective amount of the compositions or the components thereof, respectively. As such, "contacting" includes both direct contact (applying the compounds/compositions directly on the pest and/or plant - typically to the foliage, stem or roots of the plant) and indirect contact (applying the compounds/compositions to the locus of the pest and/or plant).

"Locus" means a habitat, breeding ground, plant, seed, soil, area, material or environment in which a pest or parasite is growing or may grow.

In general, "pesticidally effective amount" means the amount of active ingredient needed to achieve an observable effect on growth, including the effects of necrosis, death, retardation, prevention, and removal, destruction, or otherwise diminishing the occurrence and activity of the target organism. The pesticidally effective amount can vary for the various compounds/compositions used in the invention. A pesticidally effective amount of the compositions will also vary according to the prevailing conditions such as desired pesticidal effect and duration, weather, target species, locus, mode of application, and the like.

The separate or joint application of the compounds of the inventive compositions is carried out by spraying or dusting the seeds, the seedlings, the plants or the soils before or after sowing of the plants or before or after emergence of the plants.

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

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

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

The bait can be a liquid, a solid or a semisolid preparation (e.g. a gel). The bait employed in the composition is a product which is sufficiently attractive to incite insects such as ants,

termites, wasps, flies, mosquitoes, crickets etc. or cockroaches to eat it. This attractant may be chosen from feeding stimulants or para and / or sex pheromones readily known in the art.

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

10 The inventive compositions can be used for protecting wooden materials such as trees, board fences, sleepers, etc. and buildings such as houses, outhouses, factories, but also construction materials, furniture, leathers, fibers, vinyl articles, electric wires and cables etc. from ants and/or termites, and for controlling ants and termites from doing harm to crops or human being (e.g. when the pests invade into houses and public facilities).

15 For use in treating crop plants, the rate of application of the active ingredients of this invention may be in the range of 0.1 g to 4000 g per hectare, desirably from 25 g to 600 g per hectare, more desirably from 50 g to 500 g per hectare.

20 In the case of soil treatment or of application to the pests dwelling place or nest, the quantity of active ingredient ranges from 0.0001 to 500 g per 100 m<sup>2</sup>, preferably from 0.001 to 20 g per 100 m<sup>2</sup>.

Customary application rates in the protection of materials are, for example, from 0.01 g to 1000 g of active compound per m<sup>2</sup> treated material, desirably from 0.1 g to 50 g per m<sup>2</sup>.

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

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

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

35 The compositions are effective through both contact (via soil, glass, wall, bed net, carpet, plant parts or animal parts), and ingestion (bait, or plant part).

The compositions of the invention may also be applied against non-crop insect pests, such as ants, termites, wasps, flies, mosquitos, crickets, or cockroaches. For use against said non-crop pests, the inventive compositions are preferably used in a bait composition.

The bait can be a liquid, a solid or a semisolid preparation (e.g. a gel). Solid baits can be formed into various shapes and forms suitable to the respective application e.g. granules, blocks, sticks, disks. Liquid baits can be filled into various devices to ensure proper application, e.g. open containers, spray devices, droplet sources, or evaporation sources.

5 Gels can be based on aqueous or oily matrices and can be formulated to particular necessities in terms of stickyness, moisture retention or aging characteristics.

The bait employed in the composition is a product, which is sufficiently attractive to incite insects such as ants, termites, wasps, flies, mosquitos, crickets etc. or cockroaches to eat. The attractiveness can be manipulated by using feeding stimulants or sex pheromones. Food  
10 stimulants are chosen, for example, but not exclusively, from animal and/or plant proteins (meat-, fish- or blood meal, insect parts, egg yolk), from fats and oils of animal and/or plant origin, or mono-, oligo- or polyorganosaccharides, especially from sucrose, lactose, fructose, dextrose, glucose, starch, pectin or even molasses or honey. Fresh or decaying parts of  
15 fruits, crops, plants, animals, insects or specific parts thereof can also serve as a feeding stimulant. Sex pheromones are known to be more insect specific. Specific pheromones are described in the literature and are known to those skilled in the art.

Formulations of the inventive compositions as aerosols (e.g. in spray cans), oil sprays or pump sprays are highly suitable for the non-professional user for controlling pests such as flies, fleas, ticks, mosquitos or cockroaches. Aerosol recipes are preferably composed of the  
20 active compound, solvents such as lower alcohols (e.g. methanol, ethanol, propanol, butanol), ketones (e.g. acetone, methyl ethyl ketone), paraffin hydrocarbons (e.g. kerosenes) having boiling ranges of approximately 50 to 250 °C, dimethylformamide, N-methylpyrrolidone, dimethyl sulfoxide, aromatic hydrocarbons such as toluene, xylene, water, furthermore auxiliaries such as emulsifiers such as sorbitol monooleate, oleyl ethoxylate having 3-7 mol  
25 of ethylene oxide, fatty alcohol ethoxylate, perfume oils such as ethereal oils, esters of medium fatty acids with lower alcohols, aromatic carbonyl compounds, if appropriate stabilizers such as sodium benzoate, amphoteric surfactants, lower epoxides, triethyl orthoformate and, if required, propellants such as propane, butane, nitrogen, compressed air, dimethyl ether, carbon dioxide, nitrous oxide, or mixtures of these gases.

30 The oil spray formulations differ from the aerosol recipes in that no propellants are used.

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

The inventive compositions can also be used in mosquito and fumigating coils, smoke cartridges, vaporizer plates or long-term vaporizers and also in moth papers, moth pads or  
35 other heat-independent vaporizer systems.

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

and at least one binder. Suitable repellents for example are N,N-Diethyl-meta-toluamide (DEET), N,N-diethylphenylacetamide (DEPA), 1-(3-cyclohexan-1-yl-carbonyl)-2-methylpiperine, (2-hydroxymethylcyclohexyl) acetic acid lactone, 2-ethyl-1,3-hexandiol, indalone, Methylneodecanamide (MNDA), a pyrethroid not used for insect control such as {(+/-)-3-allyl-2-methyl-4-oxocyclopent-2-(+)-enyl-(+)-trans-chrysantemate (Esbiothrin), a repellent derived from or identical with plant extracts like limonene, eugenol, (+)-Eucamalol (1), (-)-1-epi-eucamalol or crude plant extracts from plants like Eucalyptus maculata, Vitex rotundifolia, Cymbopogon martinii, Cymbopogon citratus (lemon grass), Cymopogon nardus (citronella).

Suitable binders are selected for example from polymers and copolymers of vinyl esters of aliphatic acids (such as such as vinyl acetate and vinyl versatate), acrylic and methacrylic esters of alcohols, such as butyl acrylate, 2-ethylhexylacrylate, and methyl acrylate, mono- and di-ethylenically unsaturated hydrocarbons, such as styrene, and aliphatic diens, such as butadiene.

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

The inventive compositions can be used for protecting wooden materials such as trees, board fences, sleepers, etc. and buildings such as houses, outhouses, factories, but also construction materials, furniture, leathers, fibers, vinyl articles, electric wires and cables etc. from ants and/or termites, and for controlling ants and termites from doing harm to crops or human being (e.g. when the pests invade into houses and public facilities). The compounds of formula I are applied not only to the surrounding soil surface or into the under-floor soil in order to protect wooden materials but it can also be applied to lumbered articles such as surfaces of the under-floor concrete, alcove posts, beams, plywoods, furniture, etc., wooden articles such as particle boards, half boards, etc. and vinyl articles such as coated electric wires, vinyl sheets, heat insulating material such as styrene foams, etc. In case of application against ants doing harm to crops or human beings, the ant controller of the present invention is applied to the crops or the surrounding soil, or is directly applied to the nest of ants or the like.

The inventive compositions are also suitable for the treatment of seeds in order to protect the seed from insect pest, in particular from soil-living insect pests and the resulting plant's roots and shoots against soil pests and foliar insects.

The inventive compositions are particularly useful for the protection of the seed from soil pests and the resulting plant's roots and shoots against soil pests and foliar insects. The protection of the resulting plant's roots and shoots is preferred. More preferred is the protection of resulting plant's shoots from piercing and sucking insects, wherein the protection from aphids is most preferred.

The present invention therefore comprises a method for the protection of seeds from insects, in particular from soil insects and of the seedlings' roots and shoots from insects, in particular from soil and foliar insects, said method comprising contacting the seeds before sowing and/or after pregermination with composition of the present invention. Particularly preferred is a method, wherein the plant's roots and shoots are protected, more preferably a method,

wherein the plants shoots are protected from piercing and sucking insects, most preferably a method, wherein the plants shoots are protected from aphids.

The term seed embraces seeds and plant propagules of all kinds including but not limited to true seeds, seed pieces, suckers, corms, bulbs, fruit, tubers, grains, cuttings, cut shoots and  
5 the like and means in a preferred embodiment true seeds.

The term seed treatment comprises all suitable seed treatment techniques known in the art, such as seed dressing, seed coating, seed dusting, seed soaking and seed pelleting.

The present invention also comprises seeds coated with or containing the inventive composition.

10 The term "coated with and/or containing" generally signifies that the active ingredients are for the most part on the surface of the propagation product at the time of application, although a greater or lesser part of the ingredients may penetrate into the propagation product, depending on the method of application. When the said propagation product is (re)planted, it may absorb the active ingredients.

15 Suitable seed is seed of cereals, root crops, oil crops, vegetables, spices, ornamentals, for example seed of durum and other wheat, barley, oats, rye, maize (fodder maize and sugar maize / sweet and field corn), soybeans, oil crops, crucifers, cotton, sunflowers, bananas, rice, oilseed rape, turnip rape, sugarbeet, fodder beet, eggplants, potatoes, grass, lawn, turf, fodder grass, tomatoes, leeks, pumpkin/squash, cabbage, iceberg lettuce, pepper,  
20 cucumbers, melons, Brassica species, melons, beans, peas, garlic, onions, carrots, tuberous plants such as potatoes, sugar cane, tobacco, grapes, petunias, geranium/pelargoniums, pansies and impatiens.

In addition, the active compound may also be used for the treatment seeds from plants, which tolerate the action of herbicides or fungicides or insecticides owing to breeding,  
25 including genetic engineering methods.

For example, the active compound can be employed in treatment of seeds from plants, which are resistant to herbicides from the group consisting of the sulfonylureas, imidazolinones, glufosinate-ammonium or glyphosate-isopropylammonium and analogous active substances (see for example, EP-A 242 236, EP-A 242 246) (WO 92/00377) (EP-A 257 993, U.S.  
30 5,013,659) or in transgenic crop plants, for example cotton, with the capability of producing *Bacillus thuringiensis* toxins (Bt toxins) which make the plants resistant to certain pests (EP-A 142 924, EP-A 193 259).

The compositions may also be suitable and used for improving the health of a plant. The invention also relates to a method for improving plant health by treating a plant, its  
35 propagation material and/or the locus where the plant is growing or is to grow with an effective amount of the compositions.

The term "plant health" is to be understood to denote a condition of the plant and/or its products which is determined by several indicators alone or in combination with each other such as yield (e. g. increased biomass and/or increased content of valuable ingredients),  
40 plant vigor (e. g. improved plant growth and/or greener leaves ("greening effect")), quality

(e. g. improved content or composition of certain ingredients) and tolerance to abiotic and/or biotic stress. The above identified indicators for the health condition of a plant may be interdependent or may result from each other.

5 The components of the compositions can be present in different crystal modifications whose biological activity may differ. The compositions containing said components are likewise subject matter of the present invention.

The invention also relates to agrochemical compositions comprising an auxiliary and the components according to the invention.

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

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

25 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.

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

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

thereof.

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

Suitable anionic surfactants are alkali, alkaline earth or ammonium salts of sulfonates, sulfates, phosphates, carboxylates, and mixtures thereof. Examples of sulfonates are alkylaryl sulfonates, diphenyl sulfonates, alpha-olefin sulfonates, lignin sulfonates, sulfonates of fatty acids and oils, sulfonates of ethoxylated alkylphenols, sulfonates of alkoxyated arylphenols, sulfonates of condensed naphthalenes, sulfonates of dodecyl- and tridecylbenzenes, sulfonates of naphthalenes and alkyl naphthalenes, sulfosuccinates or sulfosuccinamates. Examples of sulfates are sulfates of fatty acids and oils, of ethoxylated alkylphenols, of alcohols, of ethoxylated alcohols, or of fatty acid esters. Examples of phosphates are phosphate esters. Examples of carboxylates are alkyl carboxylates, and carboxylated alcohol or alkylphenol ethoxylates.

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

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

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

Suitable thickeners are polysaccharides (e. g. xanthan gum, carboxymethyl cellulose),

inorganic clays (organically modified or unmodified), polycarboxylates, and silicates.

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

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

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

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

10 Suitable tackifiers or binders are polyvinyl pyrrolidones, polyvinyl acetates, polyvinyl alcohols, polyacrylates, biological or synthetic waxes, and cellulose ethers.

Examples for composition types and their preparation are:

i) Water-soluble concentrates (SL, LS)

15 10-60 wt% of the active ingredients and 5-15 wt% wetting agent (e. g. alcohol alkoxyates) are dissolved in water and/or in a water-soluble solvent (e. g. alcohols) ad 100 wt%. The active substance dissolves upon dilution with water.

ii) Dispersible concentrates (DC)

5-25 wt% of the active ingredients and 1-10 wt% dispersant (e. g. polyvinyl pyrrolidone) are dissolved in organic solvent (e. g. cyclohexanone) ad 100 wt%. Dilution with water gives a dispersion.

20 iii) Emulsifiable concentrates (EC)

15-70 wt% of the active ingredients and 5-10 wt% emulsifiers (e. g. calcium dodecylbenzenesulfonate and castor oil ethoxylate) are dissolved in water-insoluble organic solvent (e. g. aromatic hydrocarbon) ad 100 wt%. Dilution with water gives an emulsion.

iv) Emulsions (EW, EO, ES)

25 5-40 wt% of the active ingredients and 1-10 wt% emulsifiers (e. g. calcium dodecylbenzenesulfonate and castor oil ethoxylate) are dissolved in 20-40 wt% water-insoluble organic solvent (e. g. aromatic hydrocarbon). This mixture is introduced into water ad 100 wt% by means of an emulsifying machine and made into a homogeneous emulsion. Dilution with water gives an emulsion.

30 v) Suspensions (SC, OD, FS)

In an agitated ball mill, 20-60 wt% of the active ingredients are comminuted with addition of 2-10 wt% dispersants and wetting agents (e. g. sodium lignosulfonate and alcohol ethoxylate), 0.1-2 wt% thickener (e. g. xanthan gum) and water ad 100 wt% to give a fine active substance suspension. Dilution with water gives a stable suspension of the active substances. For FS type composition up to 40 wt% binder (e. g. polyvinyl alcohol) is added.

vi) Water-dispersible granules and water-soluble granules (WG, SG)

50-80 wt% of the active ingredients are ground finely with addition of dispersants and wetting agents (e. g. sodium lignosulfonate and alcohol ethoxylate) ad 100 wt% and prepared as water-dispersible or water-soluble granules by means of technical appliances (e. g. extrusion, spray tower, fluidized bed). Dilution with water gives a stable dispersion or solution of the active substances.

vii) Water-dispersible powders and water-soluble powders (WP, SP, WS)

50-80 wt% of the active ingredients are ground in a rotor-stator mill with addition of 1-5 wt% dispersants (e. g. sodium lignosulfonate), 1-3 wt% wetting agents (e. g. alcohol ethoxylate) and solid carrier (e. g. silica gel) ad 100 wt%. Dilution with water gives a stable dispersion or solution of the active substances.

viii) Gel (GW, GF)

In an agitated ball mill, 5-25 wt% of the active ingredients are comminuted with addition of 3-10 wt% dispersants (e. g. sodium lignosulfonate), 1-5 wt% thickener (e. g. carboxymethyl cellulose) and water ad 100 wt% to give a fine suspension of the active substance. Dilution with water gives a stable suspension of the active substances.

ix) Microemulsion (ME)

5-20 wt% of the active ingredients are added to 5-30 wt% organic solvent blend (e. g. fatty acid dimethyl amide and cyclohexanone), 10-25 wt% surfactant blend (e. g. alcohol ethoxylate and arylphenol ethoxylate), and water ad 100 %. This mixture is stirred for 1 h to produce spontaneously a thermodynamically stable microemulsion.

x) Microcapsules (CS)

An oil phase comprising 5-50 wt% of the active ingredients, 0-40 wt% water insoluble organic solvent (e. g. aromatic hydrocarbon), 2-15 wt% acrylic monomers (e. g. methylmethacrylate, methacrylic acid and a di- or triacrylate) are dispersed into an aqueous solution of a protective colloid (e. g. polyvinyl alcohol). Radical polymerization results in the formation of poly(meth)acrylate microcapsules. Alternatively, an oil phase comprising 5-50 wt% of a compound I according to the invention, 0-40 wt% water insoluble organic solvent (e. g. aromatic hydrocarbon), and an isocyanate monomer (e. g. diphenylmethene-4,4'-diisocyanate) are dispersed into an aqueous solution of a protective colloid (e. g. polyvinyl alcohol). The addition of a polyamine (e. g. hexamethylenediamine) results in the formation of polyurea microcapsules. The monomers amount to 1-10 wt%. The wt% relate to the total CS composition.

xi) Dustable powders (DP, DS)

1-10 wt% of the active ingredients are ground finely and mixed intimately with solid carrier (e. g. finely divided kaolin) ad 100 wt%.

xii) Granules (GR, FG)

0.5-30 wt% of the active ingredients is ground finely and associated with solid carrier (e. g. silicate) ad 100 wt%. Granulation is achieved by extrusion, spray-drying or fluidized bed.

xiii) Ultra-low volume liquids (UL)

1-50 wt% of the active ingredients are dissolved in organic solvent (e. g. aromatic hydrocarbon) ad 100 wt%.

5 The compositions types i) to xiii) may optionally comprise further auxiliaries, such as 0.1-1 wt% bactericides, 5-15 wt% anti-freezing agents, 0.1-1 wt% anti-foaming agents, and 0.1-1 wt% colorants.

10 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).

15 Furthermore, the active compounds/inventive compositions can be used also for the treatment of seeds from plants, which have modified characteristics in comparison with existing plants consist, which can be generated for example by traditional breeding methods and/or the generation of mutants, or by recombinant procedures). For example, a number of cases have been described of recombinant modifications of crop plants for the purpose of modifying the starch synthesized in the plants (e.g. WO 92/11376, WO 92/14827, WO 91/19806) or of transgenic crop plants having a modified fatty acid composition (WO 91/13972).

20 For the purposes of treatment of plant propagation materials, particularly seeds, 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. 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. Application can be carried out before or during sowing. Methods for 25 applying the inventive compositions or the components thereof, respectively, onto plant propagation material, especially seeds, include dressing, coating, pelleting, dusting, and soaking as well as in-furrow application methods. Preferably, the inventive compositions or the components thereof, respectively, are applied on to the plant propagation material by a method such that germination is not induced, e. g. by seed dressing, pelleting, coating and 30 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, and in particular from 0.1 to 0.75 kg 35 per ha.

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 seeds) are generally required.

40 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.

In a preferred embodiment a FS formulation is used for seed treatment. Typically, a FS  
5 formulation may comprise 1-800 g/l of active ingredient, 1-200 g/l Surfactant, 0 to 200 g/l antifreezing agent, 0 to 400 g/l of binder, 0 to 200 g/l of a pigment and up to 1 liter of a solvent, preferably water.

Especially preferred FS formulations of the inventive compositions or the components thereof, respectively, for seed treatment usually comprise from 0.1 to 80% by weight (1 to  
10 800 g/l) of the active ingredient, from 0.1 to 20 % by weight (1 to 200 g/l) of at least one surfactant, e.g. 0.05 to 5 % by weight of a wetter and from 0.5 to 15 % by weight of a dispersing agent, up to 20 % by weight, e.g. from 5 to 20 % of an anti-freeze agent, from 0 to 15 % by weight, e.g. 1 to 15 % by weight of a pigment and/or a dye, from 0 to 40 % by  
15 weight, e.g. 1 to 40 % by weight of a binder (sticker /adhesion agent), optionally up to 5 % by weight, e.g. from 0.1 to 5 % by weight of a thickener, optionally from 0.1 to 2 % of an anti-foam agent, and optionally a preservative such as a biocide, antioxidant or the like, e.g. in an amount from 0.01 to 1 % by weight and a filler/vehicle up to 100 % by weight.

Seed Treatment formulations may additionally also comprise binders and optionally colorants.

20 Binders can be added to improve the adhesion of the active materials on the seeds after treatment. Suitable binders are homo- and copolymers from alkylene oxides like ethylene oxide or propylene oxide, polyvinylacetate, polyvinylalcohols, polyvinylpyrrolidones, and copolymers thereof, ethylene-vinyl acetate copolymers, acrylic homo- and copolymers,  
25 polyethyleneamines, polyethyleneamides and polyethyleneimines, polysaccharides like celluloses, tylose and starch, polyolefin homo- and copolymers like olefin/maleic anhydride copolymers, polyurethanes, polyesters, polystyrene homo and copolymers

Optionally, also colorants can be included in the formulation. Suitable colorants or dyes for seed treatment formulations are Rhodamin B, C.I. Pigment Red 112, C.I. Solvent Red 1, pigment blue 15:4, pigment blue 15:3, pigment blue 15:2, pigment blue 15:1, pigment blue  
30 80, pigment yellow 1, pigment yellow 13, pigment red 112, pigment red 48:2, pigment red 48:1, pigment red 57:1, pigment red 53:1, pigment orange 43, pigment orange 34, pigment orange 5, pigment green 36, pigment green 7, pigment white 6, pigment brown 25, basic violet 10, basic violet 49, acid red 51, acid red 52, acid red 14, acid blue 9, acid yellow 23, basic red 10, basic red 108.

35 Examples of a gelling agent is carrageen (Satiagel®).

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 seeds) are generally required.

In the treatment of seed, the application rates of the inventive compositions or the components thereof, respectively, may also be suitable from 0.1 g to 10 kg per 100 kg of seed, preferably from 1 g to 5 kg per 100 kg of seed, more preferably from 1 g to 1000 g per 100 kg of seed and in particular from 1 g to 200 g per 100 kg of seed.

- 5 The invention therefore also relates to seed comprising the inventive compositions or the components thereof, respectively,, or an agriculturally useful salt thereof, as defined herein. The amount of the active compounds will in general vary from 0.1 g to 10 kg per 100 kg of seed, preferably from 1 g to 5 kg per 100 kg of seed, in particular from 1 g to 1000 g per 100 kg of seed. For specific crops such as lettuce the rate can be higher.
- 10 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, and in particular from 0.1 to 0.75 kg per ha.

- 15 Various types of oils, wetters, adjuvants, fertilizer, or micronutrients, and further pesticides (e. g. herbicides, insecticides, fungicides, growth regulators, safeners, biopesticides) may be added to the compositions comprising the respective components 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.

- 20 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  
25 50 to 400 liters, of the ready-to-use spray liquor are applied per hectare of agricultural useful area.

- According to one embodiment, individual components of the composition according to the invention such as parts of a kit or parts of a two- or three-component mixture may be mixed by the user himself in a spray tank or any other kind of vessel used for applications (e. g.  
30 seed treater drums, seed pelleting machinery, knapsack sprayer) and further auxiliaries may be added, if appropriate.

In the mixtures and compositions, the compound ratios are advantageously chosen so as to produce a synergistic effect.

- 35 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).

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).

- 40 The active compounds, separately or jointly, are usually prepared as a stock solution

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

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

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

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

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

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

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

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

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

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

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

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

Experimental data:

#### Microtest

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

#### 30 1. Activity against leaf blotch on wheat caused by *Septoria tritici* (Septtr)

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 *Septoria tritici* in an aqueous biomalt or yeast-bactopeptone-glycerine solution 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.

#### 2. Activity against wheat leaf spots caused by *Leptosphaeria nodorum* (Leptno)

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 *Leptosphaeria nodorum* in an aqueous biomalt or yeast-bactopeptone-glycerine solution 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.

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.

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

### Septtr

Active compound / active mixture	Concentration (ppm)	Mixture	Observed efficacy	Calculated efficacy according to Colby (%)	Synergism (%)
I-3	0.001	-	6		
II-2	4	-	7		
II-5	16	-	9		
I-3 II-2	0.001 4	1 : 4000	31	12	19
I-3 II-5	0.001 16	1 : 16000	35	15	20

15

### Leptno

Active compound / active mixture	Concentration (ppm)	Mixture	Observed efficacy	Calculated efficacy according to Colby (%)	Synergism (%)
I-3	0.016	-	23		
II-2	63	-	7		
II-5	63	-	12		
II-4	63	-	2		
I-3 II-2	0.016 63	1 : 4000	77	29	48
I-3 II-5	0.016 63	1 : 4000	65	32	33
I-3 II-4	0.016 63	1 : 4000	76	25	51

compound I-3 2-[4-(4-chlorophenoxy)-2-(trifluoromethyl)phenyl]-1-(1,2,4-triazol-1-yl)propan-2-ol;

compound II-2 1-(1,2-dimethylpropyl)-N-ethyl-5-methyl-N-pyridazin-4-yl-pyrazole-4-carboxamide

5 compound II-4 1-[1-(1-cyanocyclopropyl)ethyl]-N-ethyl-5-methyl-N-pyridazin-4-yl-pyrazole-4-carboxamide

compound II-5 N-ethyl-1-(2-fluoro-1-methyl-propyl)-5-methyl-N-pyridazin-4-yl-pyrazole-4-carboxamide

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10 In some aspects, embodiments of the present invention as described herein include the following items:

1. Compositions comprising,

1) as component I a compound selected from:

15 compound I-3 2-[4-(4-chlorophenoxy)-2-(trifluoromethyl)phenyl]-1-(1,2,4-triazol-1-yl)propan-2-ol;

or the N-oxides or the agriculturally acceptable salts thereof;

and

20 2) as component II a compound selected from the group consisting of 1-(1,2-dimethylpropyl)-N-ethyl-5-methyl-N-pyridazin-4-yl-pyrazole-4-carboxamide (II-2), 1-[1-(1-cyanocyclopropyl)ethyl]-N-ethyl-5-methyl-N-pyridazin-4-yl-pyrazole-4-carboxamide (II-4) and N-ethyl-1-(2-fluoro-1-methyl-propyl)-5-methyl-N-pyridazin-4-yl-pyrazole-4-carboxamide (II-5); or the stereoisomers, salts, tautomers and N-oxides of each of the compounds, wherein the component I and the component II are present in a  
25 synergistically effective amount.

2. The compositions of item 1, wherein component I and component II are present in a total weight ratio of from 1000:1 to 1:1000.

3. The compositions of any one of items 1 or 2, further comprising an agrochemical auxiliary.

30 4. A use of a composition as defined in any one of items 1 to 3 for combating phytopathogenic fungi.

5. A method for reducing phytopathogenic fungi in a plant population, comprising treating the phytopathogenic fungi or at least one of a plant propagation materials, plants, soil or seeds of the plant population with an effective amount of  
35 the composition as defined in any one of items 1 to 3.

6. Use of the composition as defined in any one of items 1 to 3 for coating a plant propagation material, wherein the composition is used in an amount of from 0.1 to

10 kg per 100 kg of the plant propagation material.

7. Use of item 6, wherein the propagation material is a seed.
8. A method for controlling insects, acarids or nematodes comprising contacting an insect, acarid or nematode or their food supply, habitat, breeding grounds or their locus with the composition as defined in any one of items 1 to 3 in pesticidally effective amounts.
9. A method of protecting plants from attack or infestation by insects, acarids or nematodes comprising contacting the plant, or the soil or water in which the plant is growing, with a pesticidally effective amount of the composition as defined in any one of items 1 to 3.
10. A method for improving plant health by treating a plant, its propagation material and/or the locus where the plant is growing or is to grow with an effective amount of the composition as defined in any one of the items 1 to 3.
11. A pesticidal composition, comprising a liquid or solid carrier and the composition as defined in any one of items 1 to 3.

## Claims:

1. Compositions comprising,
  - 1) as component I a compound selected from:
 

5                    compound I-3                    2-[4-(4-chlorophenoxy)-2-(trifluoromethyl)phenyl]-1-(1,2,4-triazol-1-yl)propan-2-ol;

or the N-oxides or the agriculturally acceptable salts thereof;

and
  - 2) as component II a compound selected from the group consisting of 1-(1,2-dimethylpropyl)-N-ethyl-5-methyl-N-pyridazin-4-yl-pyrazole-4-carboxamide (II-2), 1-[1-(1-cyanocyclopropyl)ethyl]-N-ethyl-5-methyl-N-pyridazin-4-yl-pyrazole-4-carboxamide (II-4) and N-ethyl-1-(2-fluoro-1-methyl-propyl)-5-methyl-N-pyridazin-4-yl-pyrazole-4-carboxamide (II-5); or the stereoisomers, salts, tautomers and N-oxides of each of the compounds, wherein the component I and the component II are present in a synergistically effective amount.
- 15    2. The compositions of claim 1, wherein component I and component II are present in a total weight ratio of from 1000:1 to 1:1000.
3. The compositions of any one of claims 1 or 2, further comprising an agrochemical auxiliary.
4. A use of a composition as defined in any one of claims 1 to 3 for combating
 

20                    phytopathogenic fungi.
5. A method for reducing phytopathogenic fungi in a plant population, comprising treating the phytopathogenic fungi or at least one of a plant propagation materials, plants, soil or seeds of the plant population with an effective amount of the composition as defined in any one of claims 1 to 3.
- 25    6. Use of the composition as defined in any one of claims 1 to 3 for coating a plant propagation material, wherein the composition is used in an amount of from 0.1 to 10 kg per 100 kg of the plant propagation material.
7. Use of claim 6, wherein the propagation material is a seed.
8. A method for controlling insects, acarids or nematodes comprising contacting an
 

30                    insect, acarid or nematode or their food supply, habitat, breeding grounds or their

locus with the composition as defined in any one of claims 1 to 3 in pesticidally effective amounts.

9. A method of protecting plants from attack or infestation by insects, acarids or nematodes comprising contacting the plant, or the soil or water in which the plant is growing, with a pesticidally effective amount of the composition as defined in any one of claims 1 to 3.
10. A method for improving plant health by treating a plant, its propagation material and/or the locus where the plant is growing or is to grow with an effective amount of the composition as defined in any one of the claims 1 to 3.
- 10 11. A pesticidal composition, comprising a liquid or solid carrier and the composition as defined in any one of claims 1 to 3.