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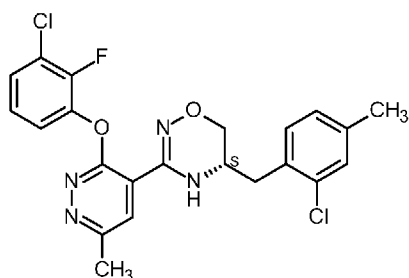
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(54) Title: CRYSTALLINE FORMS OF (5S)-3-[3-(3-CHLORO-2-FLUOROPHENOXY)-6-METHYLPYRIDAZIN-4-YL]-5-(2-CHLORO-4-METHYLBENZYL)-5,6-DIHYDRO-4H-1,2,4-OXADIAZINE



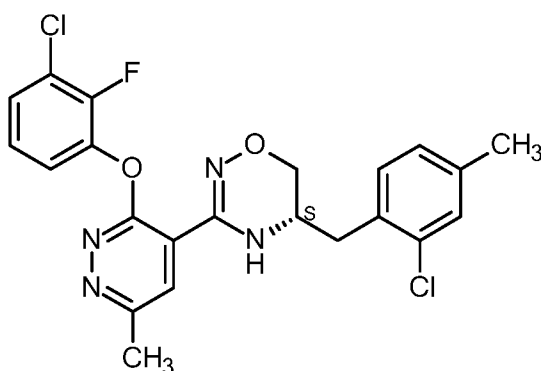
(I)

(57) Abstract: The present invention relates to novel crystalline forms of (5S)-3-[3-(3-chloro-2-fluorophenoxy)-6-methylpyridazin-4-yl]-5-(2-chloro-4-methylbenzyl)-5,6-dihydro-4H-1,2,4-oxadiazine according to formula (I), to a process for its preparation, to agrochemical formulations comprising the novel crystalline form, and to its use in plant protection applications, especially to its use as a fungicide (I).

Crystalline forms of (5S)-3-[3-(3-chloro-2-fluorophenoxy)-6-methylpyridazin-4-yl]-5-(2-chloro-4-methylbenzyl)-5,6-dihydro-4H-1,2,4-oxadiazine

Summary of the invention

The present invention relates to novel crystalline forms of (5S)-3-[3-(3-chloro-2-fluorophenoxy)-6-methylpyridazin-4-yl]-5-(2-chloro-4-methylbenzyl)-5,6-dihydro-4H-1,2,4-oxadiazine according to formula (I), to a process for its preparation, to agrochemical formulations comprising the novel crystalline form B, and to its use in plant protection applications, especially to its use as a fungicide,



(I).

10 (5S)-3-[3-(3-chloro-2-fluorophenoxy)-6-methylpyridazin-4-yl]-5-(2-chloro-4-methylbenzyl)-5,6-dihydro-4H-1,2,4-oxadiazine and a process for its preparation is known from WO 2020/127780. The process known from the prior art yields (5S)-3-[3-(3-chloro-2-fluorophenoxy)-6-methylpyridazin-4-yl]-5-(2-chloro-4-methylbenzyl)-5,6-dihydro-4H-1,2,4-oxadiazine as amorphous solid.

Background

15 Polymorphism is the ability of a compound to crystallize in different crystalline phases with different arrangements and/or conformations of the molecules in the crystal lattice. Hence, polymorphs are different crystalline forms of the same chemical compound. On account of the different arrangement and/or conformation of molecules, polymorphs may exhibit different physical, chemical and/or biological properties. Properties which may be affected include but are not limited solubility, dissolution rate,
20 stability, optical and mechanical properties, etc. The relative stability of a polymorph depends on its free energy, i.e. a more stable polymorph has a lower free energy. Under a defined set of experimental conditions only one polymorph has the lowest free energy. This polymorph is the thermodynamically stable form and all other polymorph(s) is (are) termed metastable form(s). A metastable form is one that
25 relatively slow rate of transformation.

The occurrence of active substances in different polymorphic forms (herein also named as polymorphs or crystalline forms) is of decisive importance for the production in industrial scale as well as for the

development of formulations containing the active substance, as unwanted phase change can lead to thickening and potentially solidification of the formulation and/or large crystals, which can lead to blockages in application equipment, e.g. in spray nozzles in agricultural application machinery. The knowledge of the existence of crystalline modifications and their properties is thus of high relevance. Each polymorph is characterized by a specific, uniform packing and arrangement of the molecules in the solid state. Nevertheless, it is generally not predictable whether a given chemical compound forms polymorphs at all and if so, which physical and biological properties the different polymorphs may have.

In addition pseudopolymorphic forms, named hydrates or solvates, can occur. A solvate is a crystalline molecular compound in which molecules of the solvent of crystallisation are incorporated into the host lattice, consisting of unsolvated molecules. A hydrate is a special case of a solvate, when the incorporated solvent is water. The presence of solvent molecules in the crystal lattice influences the intermolecular interactions and confers unique physical properties to each solvate. A solvate thus has its own characteristic values of internal energy, enthalpy, entropy, Gibbs free energy, and thermodynamic activity.

Figures

Fig. 1a: X-ray powder diffractogram of polymorphic form B of (5S)-3-[3-(3-chloro-2-fluorophenoxy)-6-methylpyridazin-4-yl]-5-(2-chloro-4-methylbenzyl)-5,6-dihydro-4H-1,2,4-oxadiazine

Fig. 1b: FT Raman spectrum of polymorphic form B of (5S)-3-[3-(3-chloro-2-fluorophenoxy)-6-methylpyridazin-4-yl]-5-(2-chloro-4-methylbenzyl)-5,6-dihydro-4H-1,2,4-oxadiazine

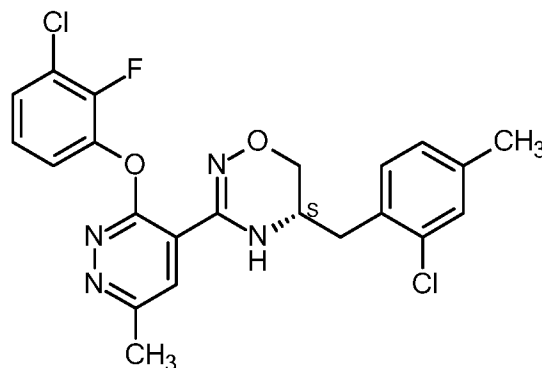
Fig. 1c: IR spectrum of polymorphic form B of (5S)-3-[3-(3-chloro-2-fluorophenoxy)-6-methylpyridazin-4-yl]-5-(2-chloro-4-methylbenzyl)-5,6-dihydro-4H-1,2,4-oxadiazine

Fig. 2a: X-ray powder diffractogram of polymorphic form A of (5S)-3-[3-(3-chloro-2-fluorophenoxy)-6-methylpyridazin-4-yl]-5-(2-chloro-4-methylbenzyl)-5,6-dihydro-4H-1,2,4-oxadiazine

Fig 3a: X-ray powder diffractogram after slurry experiment 3 (8 d/80°C CH₃CN/H₂O)

Detailed description

In one embodiment, the present invention relates to the novel crystalline form B of (5S)-3-[3-(3-chloro-2-fluorophenoxy)-6-methylpyridazin-4-yl]-5-(2-chloro-4-methylbenzyl)-5,6-dihydro-4H-1,2,4-oxadiazine according to formula (I),



(I).

The process according to WO 2020/127780 yields (5S)-3-[3-(3-chloro-2-fluorophenoxy)-6-methylpyridazin-4-yl]-5-(2-chloro-4-methylbenzyl)-5,6-dihydro-4H-1,2,4-oxadiazine as undesired amorphous form.

- 5 Object of the present invention is therefore the provision of a polymorphic form having superior application properties, in particular superior physiochemical properties such as high stability in suspension concentrate (SC) formulations.

The compound of formula (I) crystallizes in two modifications, A and B. Polymorphic form A and B are enantiotropically related demonstrating a critical transition temperature between 49°C and 66°C. This
10 temperature range can be achieved during formulation processes and may lead to solid solid transformation from polymorphic form B to polymorphic form A which may recrystallize into form B at room temperature initiating agglomeration in solid based formulation types.

It has now surprisingly been found that the polymorphic form B of compound of formula (I) has superior properties. Polymorphic form B displays improved, beneficial properties for preparation of formulations
15 compared to the amorphous form known from the prior art. In particular, polymorphic form B displays a high stability in suspension concentrate (SC) formulations such as high dilution stability, in particular suspensibility, and thereby ensures that an undesired conversion into another polymorphic form of the compound of formula (I) is prevented. It is known that polymorph transitions are expected to cause instability in SC formulations (J. Weiss et al., J. Am. Oil Chem. Soc. 2008, 85, 501-511; D.J. Burgess et al., Int. J.
20 Pharmaceutics, 2014, Vol. 466, 223-232), such as aggregation of particles which lead to lower suspensibility. Additionally, the polymorphic form B exhibits a surprisingly high stability in slurry experiments performed above the transition temperature range over an extended period of time. No recrystallization events were observed. The high stability ensures that associated changes in the properties as described above are prevented and thus enhances the safety and quality of formulations and/or compositions comprising the polymorphic
25 form B of the compound of formula (I).

The polymorphic form B of (5S)-3-[3-(3-chloro-2-fluorophenoxy)-6-methylpyridazin-4-yl]-5-(2-chloro-4-methylbenzyl)-5,6-dihydro-4H-1,2,4-oxadiazine can be characterized by X-ray powder diffractometry on

the basis of the respective diffraction diagrams, which are recorded at 25°C and with Cu-K α 1 radiation (1.5406 Å). The polymorphic form B according to the present invention displays at least 3, often at least 5, in particular at least 7, more particularly at least 10, and especially all of the reflections quoted in the following as values:

5 **Table 1:** X-ray reflections of polymorphic form B

Reflections [2 Θ values]
x \pm 0,2°
5.3
6.7
8.5
10.6
14.5
15.8
17.2
19.0
19.4
20.2
21.1
22.1
22.7
22.9
23.3
24.2
25.1
26.6
27.3
27.7
29.0
29.2
31.1
31.5
32.0
32.4

Reflections [2 Θ values]
33.1
34.3
35.0

The polymorphic form B according to the present invention is further characterized by the X-ray powder diffractogram depicted in Fig. 1a.

The polymorphic form B of the compound of formula (I) is characterized in that the X-ray powder diffractogram using Cu-K α 1 radiation at 25°C has at least the following reflections: 20.2, 23.3 and 25.1, preferably at least the following reflections: 20.2, 23.3, 25.1, 14.5 and 19.4, more preferably at least the following reflections: 20.2, 23.3, 25.1, 14.5, 19.4, 23.4 and 10.6.

The polymorphic form B of (5S)-3-[3-(3-chloro-2-fluorophenoxy)-6-methylpyridazin-4-yl]-5-(2-chloro-4-methylbenzyl)-5,6-dihydro-4H-1,2,4-oxadiazine can also be characterized by Raman spectroscopy on the basis of the respective spectrum, which are recorded at 25°C and with a laser wavelength of 1064 nm and a resolution of 2 cm⁻¹. The polymorphic form B according to the present invention displays at least 3, often at least 5, in particular at least 7, and especially all of the bands quoted in the following as peak maxima:

Table 2: Raman bands of form B

Raman band [peak maxima in cm ⁻¹] Form B
3084
3063
3047
3003
2988
2957
2925
2893
2741
1609
1585
1534
1499
1478
1445

Raman band [peak maxima in cm^{-1}]
Form B
1404
1382
1345
1331
1279
1255
1215
1193
1177
1149
1137
1125
1085
1058
1043
998
983
946
884
817
776
723
688
679
667
608
593
582
559
542
533
505
496
475

Raman band [peak maxima in cm^{-1}]
Form B
465
413
394
345
333
312
281
249
241
218
191
148
132
112
98

The polymorphic form B of the compound of formula (I) is characterized by the following bands: 98, 112 and 1585, preferably at least by the following bands: 98, 112, 1585, 1279 and 2925, more preferably at least by the following bands 98, 112, 1585, 1279, 2925, 688 and 1609.

- 5 The polymorphic form B of (5S)-3-[3-(3-chloro-2-fluorophenoxy)-6-methylpyridazin-4-yl]-5-(2-chloro-4-methylbenzyl)-5,6-dihydro-4H-1,2,4-oxadiazine can also be characterized by infrared spectroscopy on the basis of the respective spectrum, which are recorded at 25°C using an universal diamond ATR device and a resolution of 2 cm^{-1} . The polymorphic form B according to the present invention displays at least 3, often at least 5, in particular at least 7, and especially all of the bands quoted in the following as peak maxima:

10 **Table 3:** IR bands of form B

IR band [peak maxima in cm^{-1}]
Form B
3421
3082
3062
2985
2959

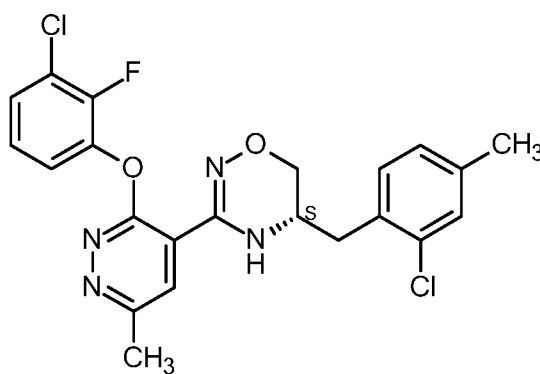
IR band [peak maxima in cm^{-1}]
Form B
2924
2891
1614
1599
1584
1534
1493
1476
1460
1446
1437
1403
1383
1351
1331
1274
1255
1242
1216
1173
1150
1112
1087
1051
1042
1014
983
959
944
921
882
868
819
806

IR band [peak maxima in cm ⁻¹]
Form B
775
723
687
678
666
651
608
594
581
559

The polymorphic form B of the compound of formula (I) is characterized by the following bands: 1403, 819 and 806, preferably at least by the following bands: 1403, 819, 806, 1476 and 1274, more preferably at least by the following bands 1403, 819, 806, 1476, 1274, 1383 and 921.

In addition to the polymorphic form B, one further polymorphic form A (Fig 2a) has been identified, which is further characterized in the following.

In another embodiment, the present invention relates to the novel crystalline form A of (5S)-3-[3-(3-chloro-2-fluorophenoxy)-6-methylpyridazin-4-yl]-5-(2-chloro-4-methylbenzyl)-5,6-dihydro-4H-1,2,4-oxa-diazine according to formula (I),



(I).

10 The polymorphic form A of (5S)-3-[3-(3-chloro-2-fluorophenoxy)-6-methylpyridazin-4-yl]-5-(2-chloro-4-methylbenzyl)-5,6-dihydro-4H-1,2,4-oxadiazine can be characterized by X-ray powder diffractometry on the basis of the respective diffraction diagrams, which are recorded at 25°C and with Cu-K α 1 radiation (1.5406 Å). The polymorphic form A displays at least 3, often at least 5, in particular at least 7, more particularly at least 10, and especially all of the reflections quoted in the following as values:

Table 4: X-ray reflections of polymorphic form A

Reflections [2θ values]
Form A
$x \pm 0,2^\circ$
6.5
8.4
12.7
13.1
13.7
14.2
15.9
16.6
16.9
17.2
18.3
18.6
19.0
19.8
20.5
20.8
21.1
21.8
22.2
22.5
22.9
24.0
24.2
24.5
24.7
25.7
26.8
27.3
27.8
28.8
29.5

Reflections [2 Θ values]
Form A
30.5
31.1
31.2
32.2
32.6
32.9
33.4
34.0
34.7
34.9
35.2
36.1
37.6
38.4
38.8

The polymorphic form A of the compound of formula (I) is characterized in that the X-ray powder diffractogram using Cu-K α 1 radiation at 25°C has at least the following reflections: 16.9, 19.8 and 24.5 preferably at least the following reflections: 16.9, 19.8, 24.5, 14.2 and 24.7, more preferably at least the following reflections: 16.9, 19.8, 24.5, 14.2, 24.7, 20.8 and 21.8, most preferably at least the following reflections: 16.9, 19.8, 24.5, 14.2, 24.7, 20.8, 21.8, 38.9, 38.3 and 29.5, each quoted as 2 Θ value \pm 0.2°.

The polymorphic form A is further characterized by the X-ray powder diffractograms depicted in Fig. 2a.

The thermodynamic stabilities of polymorphic form A and B are highly complex. Both forms are enantiotropically related with a transition temperature in a range from 49°C to 66°C. Below these temperatures polymorphic form B is the thermodynamically stable polymorph. Polymorphic form A recrystallizes at higher temperatures but shows very fast transition to polymorphic form B at lower temperatures.

In a further embodiment, the present invention is directed to a process for the production of the polymorphic form B, comprising the following steps:

- 15 a) diluting the compound of formula (I) in a suitable solvent or solvent mixture,
- b) heating the composition of step a) to a temperature of at least 70°C, and

c) cooling the solution from step b) to a temperature of less than 20°C.

The chemical preparation of (5S)-3-[3-(3-chloro-2-fluorophenoxy)-6-methylpyridazin-4-yl]-5-(2-chloro-4-methylbenzyl)-5,6-dihydro-4H-1,2,4-oxadiazine according to formula (I) is known from WO 2020/127780. The compound of formula (I) as used in step a) can thus be prepared according to WO
5 2020/127780, to which full reference is made hereby.

The compound of formula (I) in step a) can essentially be any known form of (5S)-3-[3-(3-chloro-2-fluorophenoxy)-6-methylpyridazin-4-yl]-5-(2-chloro-4-methylbenzyl)-5,6-dihydro-4H-1,2,4-oxadiazine. This means that (5S)-3-[3-(3-chloro-2-fluorophenoxy)-6-methylpyridazin-4-yl]-5-(2-chloro-4-methylbenzyl)-5,6-dihydro-4H-1,2,4-oxadiazine can be used in amorphous form or in a mixture of
10 different polymorphic forms or in a mixture containing an amorphous and one or more different polymorphic forms.

Suitable solvents or solvent mixtures which can be used to dilute and/or suspend the compound of formula (I) in step a) and from which the compound of formula (I) is obtained in polymorphic form B in step c), are toluene, tetrahydrofuran, acetone, ethyl acetate, acetonitrile, methanol, ethanol, iso-propanol, N,N-dimethylformamide, 1,4-dioxane or DMSO, preferably toluene, ethanol or 1,4-dioxane.
15

The solution of (5S)-3-[3-(3-chloro-2-fluorophenoxy)-6-methylpyridazin-4-yl]-5-(2-chloro-4-methylbenzyl)-5,6-dihydro-4H-1,2,4-oxadiazine can also be prepared by transferring a reaction mixture obtained by chemical reaction, containing (5S)-3-[3-(3-chloro-2-fluorophenoxy)-6-methylpyridazin-4-yl]-5-(2-chloro-4-methylbenzyl)-5,6-dihydro-4H-1,2,4-oxadiazine, if necessary after removal of reagents and/or
20 side products into a solvent or solvent mixture according to the present invention.

In step b) the solution or slurry is usually heated to a temperature of at least 70°C, preferably to a temperature of at least 90°C. In a preferred embodiment each solvent or solvent mixture is heated to its boiling temperature.

In step c) the solution or slurry is cooled to a temperature of less than 20°C, preferably less than 0°C.

25 The crystallization of polymorphic form B can be promoted or accelerated by seeding with seed crystals of form B.

The isolation of the polymorphic form B from the mother liquid is effected by common techniques known in the art, for example by filtration, centrifugation or by decanting.

More preferably, the polymorphic form B is isolated from the solvent or solvent mixture by allowing the
30 solution or slurry to stand at the crystallization conditions of step c) until at least 90 wt.-% of the solvent or solvent mixture is evaporated.

The isolated polymorphic form B can optionally be washed with any solvent, preferably with the solvent or solvent mixture used for crystallization, with water or with a mixture of the solvent or solvent mixture and water. The washing step can optionally be repeated, whereby washing with water often is the last washing step. The washing is typically performed at temperatures below 30°C, often below 25°C and in particular below 20°C, optionally at 0 °C. In a further, optionally step, the crystals of polymorphic form B can be dried and then supplied for further processing.

By means of the crystallization according to the present invention, form B of (5S)-3-[3-(3-chloro-2-fluorophenoxy)-6-methylpyridazin-4-yl]-5-(2-chloro-4-methylbenzyl)-5,6-dihydro-4H-1,2,4-oxadiazine is obtained with at least 85 %, in particular 90 %, and most preferably at least ≥ 95 %.

Thus, a particular embodiment of the present invention relates to (5S)-3-[3-(3-chloro-2-fluorophenoxy)-6-methylpyridazin-4-yl]-5-(2-chloro-4-methylbenzyl)-5,6-dihydro-4H-1,2,4-oxadiazine, which consists of at least 85 % and often at least 90 % or at least ≥ 95 % of the polymorphic form B.

In a further embodiment, the present invention is directed to a plant protection agent in the form of customary formulations containing the polymorphic form B of (5S)-3-[3-(3-chloro-2-fluorophenoxy)-6-methylpyridazin-4-yl]-5-(2-chloro-4-methylbenzyl)-5,6-dihydro-4H-1,2,4-oxadiazine.

In a preferred embodiment of the present invention, the plant protection agent contains more than 90 wt.%, and preferably more than 95 wt.%, of the polymorphic form B of the compound of the formula (I) based on the total amount of all forms of the compound of the formula (I) present in the composition.

It has now surprisingly been found that the polymorphic form B has improved handling and formulation properties such as a high stability of SC formulation, such as high dilution stability, in particular high suspensibility, in particular at higher temperatures, even above the transition temperature range. In a further embodiment, the present invention is therefore directed to the use of the polymorphic form B of the compound of formula (I) for the production of a formulation with high stability, preferably high dilution stability, more preferably high suspensibility, in particular at temperatures above transition temperature range.

Uses

In a further embodiment, the present invention is directed to the use of the polymorphic form B of the compound of formula (I) for controlling unwanted microorganisms, preferably unwanted fungi and viruses. In a particular embodiment, the present invention is directed to controlling unwanted fungi in plants. In a particular embodiment of the present invention, the useful plants are transgenic plants.

In a further embodiment, the present invention is directed to a method for controlling unwanted microorganisms, wherein the polymorphic form B or a plant protection agent as defined above containing the polymorphic form B, is applied to plants.

5 The compound and the composition of the invention have potent microbicidal activity and/or plant defense modulating potential. They can be used for controlling unwanted microorganisms, such as unwanted fungi and viruses, on plants. They can be particularly useful in crop protection (they control microorganisms that cause plants diseases) or for protecting materials (e.g. industrial materials, timber, storage goods) as described in more details herein below. More specifically, the compound and the composition of the invention can be used to protect seeds, germinating seeds, emerged seedlings, plants, plant parts, fruits,
10 harvest goods and/or the soil in which the plants grow from unwanted microorganisms.

Control or controlling as used herein encompasses protective, curative and eradicated treatment of unwanted microorganisms. Unwanted microorganisms may be pathogenic virus or pathogenic fungi, more specifically phytopathogenic virus, or phytopathogenic fungi. As detailed herein below, these phytopathogenic microorganisms are the causal agents of a broad spectrum of plants diseases.

15 More specifically, the compound and the composition of the invention can be used as fungicides. For the purpose of the specification, the term “fungicide” refers to a compound or composition that can be used in crop protection for the control of unwanted fungi, such as Plasmodiophoromycetes, Chytridiomycetes, Zygomycetes, Ascomycetes, Basidiomycetes and Deuteromycetes.

The compound and the composition of the invention may also be used as antiviral agent in crop protection.
20 For example the compound and the composition of the invention may have effects on diseases from plant viruses, such as the tobacco mosaic virus (TMV), tobacco rattle virus, tobacco stunt virus (TStuV), tobacco leaf curl virus (VLCV), tobacco nervilia mosaic virus (TVBMV), tobacco necrotic dwarf virus (TNDV), tobacco streak virus (TSV), potato virus X (PVX), potato viruses Y, S, M, and A, potato acuba mosaic virus (PAMV), potato mop-top virus (PMTV), potato leaf-roll virus (PLRV), alfalfa mosaic virus
25 (AMV), cucumber mosaic virus (CMV), cucumber green mottle mosaic virus (CGMMV), cucumber yellows virus (CuYV), watermelon mosaic virus (WMV), tomato spotted wilt virus (TSWV), tomato ringspot virus (TomRSV), sugarcane mosaic virus (SCMV), rice dwarf virus, rice stripe virus, rice black-streaked dwarf virus, strawberry mottle virus (SMoV), strawberry vein banding virus (SVBV), strawberry mild yellow edge virus (SMYEV), strawberry crinkle virus (SCrV), broad beanwilt virus (BBWV), and
30 melon necrotic spot virus (MNSV).

The present invention also relates to a method for controlling unwanted microorganisms, such as unwanted fungi, on plants comprising the step of applying the polymorphic form B of the compound of formula (I) of the invention or at least one composition of the invention to the microorganisms and/or their habitat (to the plants, plant parts, seeds, fruits or to the soil in which the plants grow).

Typically, when the compound and the composition of the invention are used in curative or protective methods for controlling phytopathogenic fungi, an effective and plant-compatible amount thereof is applied to the plants, plant parts, fruits, seeds or to the soil or substrates in which the plants grow. Suitable substrates that may be used for cultivating plants include inorganic based substrates, such as mineral wool, in particular stone wool, perlite, sand or gravel; organic substrates, such as peat, pine bark or sawdust; and petroleum based substrates such as polymeric foams or plastic beads. Effective and plant-compatible amount means an amount that is sufficient to control or destroy the fungi present or liable to appear on the cropland and that does not entail any appreciable symptom of phytotoxicity for said crops. Such an amount can vary within a wide range depending on the fungus to be controlled, the type of crop, the crop growth stage, the climatic conditions and the respective compound or composition of the invention used. This amount can be determined by systematic field trials that are within the capabilities of a person skilled in the art.

Plants and plant parts

The compound and the composition of the invention may be applied to any plants or plant parts.

Plants mean all plants and plant populations, such as desired and undesired wild plants or crop plants (including naturally occurring crop plants). Crop plants may be plants which can be obtained by conventional breeding and optimization methods or by biotechnological and genetic engineering methods or combinations of these methods, including the genetically modified plants (GMO or transgenic plants) and the plant cultivars which are protectable and non-protectable by plant breeders' rights.

Plant cultivars are understood to mean plants which have new properties ("traits") and have been obtained by conventional breeding, by mutagenesis or by recombinant DNA techniques. They can be cultivars, varieties, bio- or genotypes.

Plant parts are understood to mean all parts and organs of plants above and below the ground, such as shoots, leaves, needles, stalks, stems, flowers, fruit bodies, fruits, seeds, roots, tubers and rhizomes. The plant parts also include harvested material and vegetative and generative propagation material, for example cuttings, tubers, rhizomes, slips and seeds.

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Plants which may be treated in accordance with the methods of the invention include the following: cotton, flax, grapevine, fruit, vegetables, such as *Rosaceae sp.* (for example pome fruits such as apples and pears, but also stone fruits such as apricots, cherries, almonds and peaches, and soft fruits such as strawberries), *Ribesioideae sp.*, *Juglandaceae sp.*, *Betulaceae sp.*, *Anacardiaceae sp.*, *Fagaceae sp.*, *Moraceae sp.*, *Oleaceae sp.*, *Actinidaceae sp.*, *Lauraceae sp.*, *Musaceae sp.* (for example banana trees and plantations), *Rubiaceae sp.* (for example coffee), *Theaceae sp.*, *Sterculiaceae sp.*, *Rutaceae sp.* (for example lemons, oranges and grapefruit); *Solanaceae sp.* (for example potatoes and tomatoes), *Liliaceae sp.*, *Asteraceae sp.* (for example lettuce), *Umbelliferae sp.*, *Cruciferae sp.*, *Chenopodiaceae sp.*, *Cucurbitaceae sp.* (for example cucumber), *Alliaceae sp.* (for example leek, onion), *Papilionaceae sp.* (for example peas); major crop plants, such as *Gramineae sp.* (for example maize, turf, cereals such as wheat, rye, rice, barley, oats, millet and triticale), *Asteraceae sp.* (for example sunflower), *Brassicaceae sp.* (for example white cabbage, red cabbage, broccoli, cauliflower, Brussels sprouts, pak choi, kohlrabi, radishes, and oilseed rape, mustard, horseradish and cress), *Fabaceae sp.* (for example bean, peanuts), *Papilionaceae sp.* (for example soya bean), *Chenopodiaceae sp.* (for example sugar beet, fodder beet, swiss chard, beetroot); useful plants and ornamental plants for gardens and wooded areas; and genetically modified varieties of each of these plants.

Plants and plant cultivars which may be treated by the above disclosed methods include plants and plant cultivars which are resistant against one or more biotic stresses, i.e. said plants show a better defense against animal and microbial pests, such as against nematodes, insects, mites, phytopathogenic fungi, bacteria, viruses and/or viroids.

Plants and plant cultivars which may be treated by the above disclosed methods include those plants which are resistant to one or more abiotic stresses. Abiotic stress conditions may include, for example, drought, cold temperature exposure, heat exposure, osmotic stress, flooding, increased soil salinity, increased mineral exposure, ozone exposure, high light exposure, limited availability of nitrogen nutrients, limited availability of phosphorus nutrients, shade avoidance.

Plants and plant cultivars which may be treated by the above disclosed methods include those plants characterized by enhanced yield characteristics. Increased yield in said plants may be the result of, for example, improved plant physiology, growth and development, such as water use efficiency, water retention efficiency,

improved nitrogen use, enhanced carbon assimilation, improved photosynthesis, increased germination efficiency and accelerated maturation. Yield may furthermore be affected by improved plant architecture (under stress and non-stress conditions), including but not limited to, early flowering, flowering control for hybrid seed production, seedling vigor, plant size, internode number and distance, root growth, seed size, fruit size, pod size, pod or ear number, seed number per pod or ear, seed mass, enhanced seed filling, reduced seed dispersal, reduced pod dehiscence and lodging resistance. Further yield traits include seed composition, such as carbohydrate content and composition for example cotton or starch, protein content, oil content and composition, nutritional value, reduction in anti-nutritional compounds, improved processability and better storage stability.

Plants and plant cultivars which may be treated by the above disclosed methods include plants and plant cultivars which are hybrid plants that already express the characteristic of heterosis or hybrid vigor which results in generally higher yield, vigor, health and resistance towards biotic and abiotic stresses.

Transgenic plants, seed treatment and integration events

The polymorphic form B of the compound of formula (I) according to the invention can be advantageously used to treat transgenic plants, plant cultivars or plant parts that received genetic material which imparts advantageous and/or useful properties (traits) to these plants, plant cultivars or plant parts. Therefore, it is contemplated that the present invention may be combined with one or more recombinant traits or transgenic event(s) or a combination thereof. For the purposes of this application, a transgenic event is created by the insertion of a specific recombinant DNA molecule into a specific position (locus) within the chromosome of the plant genome. The insertion creates a novel DNA sequence referred to as an “event” and is characterized by the inserted recombinant DNA molecule and some amount of genomic DNA immediately adjacent to/flanking both ends of the inserted DNA. Such trait(s) or transgenic event(s) include, but are not limited to, pest resistance, water use efficiency, yield performance, drought tolerance, seed quality, improved nutritional quality, hybrid seed production, and herbicide tolerance, in which the trait is measured with respect to a plant lacking such trait or transgenic event. Concrete examples of such advantageous and/or useful properties (traits) are better plant growth, vigor, stress tolerance, standability, lodging resistance, nutrient uptake, plant nutrition, and/or yield, in particular improved growth, increased tolerance to high or low temperatures, increased tolerance to drought or to levels of water or soil salinity, enhanced flowering performance, easier harvesting, accelerated ripening, higher yields, higher quality and/or a higher nutritional value of the harvested products, better storage life and/or processability of the harvested products, and increased resistance against animal and microbial pests, such as against insects, arachnids, nematodes, mites, slugs and snails.

Among DNA sequences encoding proteins which confer properties of tolerance to such animal and microbial pests, in particular insects, mention will particularly be made of the genetic material from *Bacillus thuringiensis* encoding the Bt proteins widely described in the literature and well known to

those skilled in the art. Mention will also be made of proteins extracted from bacteria such as *Photorhabdus* (WO97/17432 and WO98/08932). In particular, mention will be made of the Bt Cry or VIP proteins which include the CryIA, CryIAb, CryIAc, CryIIA, CryIIIA, CryIIIB2, Cry9c Cry2Ab, Cry3Bb and CryIF proteins or toxic fragments thereof and also hybrids or combinations thereof, especially the CryIF protein or hybrids derived from a CryIF protein (e.g. hybrid CryIA-CryIF proteins or toxic fragments thereof), the CryIA-type proteins or toxic fragments thereof, preferably the CryIAc protein or hybrids derived from the CryIAc protein (e.g. hybrid CryIAb-CryIAc proteins) or the CryIAb or Bt2 protein or toxic fragments thereof, the Cry2Ae, Cry2Af or Cry2Ag proteins or toxic fragments thereof, the CryIA.105 protein or a toxic fragment thereof, the VIP3Aa19 protein, the VIP3Aa20 protein, the VIP3A proteins produced in the COT202 or COT203 cotton events, the VIP3Aa protein or a toxic fragment thereof as described in Estruch et al. (1996), Proc Natl Acad Sci US A. 28;93(11):5389-94, the Cry proteins as described in WO2001/47952, the insecticidal proteins from *Xenorhabdus* (as described in WO98/50427), *Serratia* (particularly from *S. entomophila*) or *Photorhabdus* species strains, such as Tc-proteins from *Photorhabdus* as described in WO98/08932. Also any variants or mutants of any one of these proteins differing in some amino acids (1-10, preferably 1-5) from any of the above named sequences, particularly the sequence of their toxic fragment, or which are fused to a transit peptide, such as a plastid transit peptide, or another protein or peptide, is included herein.

Another and particularly emphasized example of such properties is conferred tolerance to one or more herbicides, for example imidazolinones, sulphonylureas, glyphosate or phosphinothricin. Among DNA sequences encoding proteins which confer properties of tolerance to certain herbicides on the transformed plant cells and plants, mention will be particularly be made to the bar or PAT gene or the *Streptomyces coelicolor* gene described in WO2009/152359 which confers tolerance to glufosinate herbicides, a gene encoding a suitable EPSPS ((5-Enolpyruvylshikimat-3-phosphat-synthase) which confers tolerance to herbicides having EPSPS as a target, especially herbicides such as glyphosate and its salts, a gene encoding glyphosate-n-acetyltransferase, or a gene encoding glyphosate oxidoreductase. Further suitable herbicide tolerance traits include at least one ALS (acetolactate synthase) inhibitor (e.g. WO2007/024782), a mutated *Arabidopsis* ALS/AHAS gene (e.g. U.S. Patent 6,855,533), genes encoding 2,4-D-monooxygenases conferring tolerance to 2,4-D (2,4- dichlorophenoxyacetic acid) and genes encoding Dicamba monooxygenases conferring tolerance to dicamba (3,6-dichloro-2- methoxybenzoic acid).

Yet another example of such properties is resistance to one or more phytopathogenic fungi, for example Asian Soybean Rust. Among DNA sequences encoding proteins which confer properties of resistance to such diseases, mention will particularly be made of the genetic material from *glycine tomentella*, for example from any one of publically available accession lines PI441001 , PI483224, PI583970, PI446958, PI499939, PI505220, PI499933, PI441008, PI505256 or PI446961 as described in WO2019/103918.

Further and particularly emphasized examples of such properties are increased resistance against bacteria and/or viruses owing, for example, to systemic acquired resistance (SAR), systemin, phytoalexins, elicitors and also resistance genes and correspondingly expressed proteins and toxins.

Particularly useful transgenic events in transgenic plants or plant cultivars which can be treated with preference in accordance with the invention include Event 531/ PV-GHBK04 (cotton, insect control, described in WO2002/040677), Event 1143-14A (cotton, insect control, not deposited, described in WO2006/128569); Event 1143-51B (cotton, insect control, not deposited, described in WO2006/128570); Event 1445 (cotton, herbicide tolerance, not deposited, described in US-A 2002-120964 or WO2002/034946); Event 17053 (rice, herbicide tolerance, deposited as PTA-9843, described in WO2010/117737); Event 17314 (rice, herbicide tolerance, deposited as PTA-9844, described in WO2010/117735); Event 281-24-236 (cotton, insect control - herbicide tolerance, deposited as PTA-6233, described in WO2005/103266 or US-A 2005-216969); Event 3006-210-23 (cotton, insect control - herbicide tolerance, deposited as PTA-6233, described in US-A 2007-143876 or WO2005/103266); Event 3272 (corn, quality trait, deposited as PTA-9972, described in WO2006/098952 or US-A 2006-230473); Event 33391 (wheat, herbicide tolerance, deposited as PTA-2347, described in WO2002/027004), Event 40416 (corn, insect control - herbicide tolerance, deposited as ATCC PTA-11508, described in WO 11/075593); Event 43A47 (corn, insect control - herbicide tolerance, deposited as ATCC PTA-11509, described in WO2011/075595); Event 5307 (corn, insect control, deposited as ATCC PTA-9561, described in WO2010/077816); Event ASR-368 (bent grass, herbicide tolerance, deposited as ATCC PTA-4816, described in US-A 2006-162007 or WO2004/053062); Event B16 (corn, herbicide tolerance, not deposited, described in US-A 2003-126634); Event BPS-CV127- 9 (soybean, herbicide tolerance, deposited as NCIMB No. 41603, described in WO2010/080829); Event BLRI (oilseed rape, restoration of male sterility, deposited as NCIMB 41193, described in WO2005/074671), Event CE43-67B (cotton, insect control, deposited as DSM ACC2724, described in US-A 2009-217423 or WO2006/128573); Event CE44-69D (cotton, insect control, not deposited, described in US-A 2010- 0024077); Event CE44-69D (cotton, insect control, not deposited, described in WO2006/128571); Event CE46-02A (cotton, insect control, not deposited, described in WO2006/128572); Event COT102 (cotton, insect control, not deposited, described in US-A 2006-130175 or WO2004/039986); Event COT202 (cotton, insect control, not deposited, described in US-A 2007-067868 or WO2005/054479); Event COT203 (cotton, insect control, not deposited, described in WO2005/054480);); Event DAS21606-3 / 1606 (soybean, herbicide tolerance, deposited as PTA-11028, described in WO2012/033794), Event DAS40278 (corn, herbicide tolerance, deposited as ATCC PTA-10244, described in WO2011/022469); Event DAS-44406-6 / pDAB8264.44.06.1 (soybean, herbicide tolerance, deposited as PTA-11336, described in WO2012/075426), Event DAS-14536-7 /pDAB8291.45.36.2 (soybean, herbicide tolerance, deposited as PTA-11335, described in WO2012/075429), Event DAS-59122-7 (corn, insect control - herbicide tolerance, deposited as ATCC PTA 11384, described in US-A 2006-

070139); Event DAS-59132 (corn, insect control - herbicide tolerance, not deposited, described in WO2009/100188); Event DAS68416 (soybean, herbicide tolerance, deposited as ATCC PTA-10442, described in WO2011/066384 or WO2011/066360); Event DP-098140-6 (corn, herbicide tolerance, deposited as ATCC PTA-8296, described in US-A 2009- 137395 or WO 08/112019); Event DP-
5 305423-1 (soybean, quality trait, not deposited, described in US-A 2008-312082 or WO2008/054747); Event DP-32138-1 (corn, hybridization system, deposited as ATCC PTA-9158, described in US-A 2009-0210970 or WO2009/103049); Event DP-356043-5 (soybean, herbicide tolerance, deposited as ATCC PTA-8287, described in US-A 2010-0184079 or WO2008/002872); Event EE-I (brinjal, insect control, not deposited, described in WO 07/091277); Event Fil 17 (corn,
10 herbicide tolerance, deposited as ATCC 209031, described in US-A 2006-059581 or WO 98/044140); Event FG72 (soybean, herbicide tolerance, deposited as PTA-11041, described in WO2011/063413), Event GA21 (corn, herbicide tolerance, deposited as ATCC 209033, described in US-A 2005-086719 or WO 98/044140); Event GG25 (corn, herbicide tolerance, deposited as ATCC 209032, described in US-A 2005-188434 or WO98/044140); Event GHB119 (cotton, insect control - herbicide tolerance, deposited as ATCC PTA-8398, described in WO2008/151780); Event GHB614 (cotton, herbicide tolerance, deposited as ATCC PTA-6878, described in US-A 2010-050282 or WO2007/017186); Event GJ11 (corn, herbicide tolerance, deposited as ATCC 209030, described in US-A 2005-188434 or WO98/044140); Event GM RZ13 (sugar beet, virus resistance, deposited as NCIMB-41601, described in WO2010/076212); Event H7-1 (sugar beet, herbicide tolerance, deposited as NCIMB
20 41158 or NCIMB 41159, described in US-A 2004-172669 or WO 2004/074492); Event JOPLINI (wheat, disease tolerance, not deposited, described in US-A 2008-064032); Event LL27 (soybean, herbicide tolerance, deposited as NCIMB41658, described in WO2006/108674 or US-A 2008-320616); Event LL55 (soybean, herbicide tolerance, deposited as NCIMB 41660, described in WO 2006/108675 or US-A 2008-196127); Event LLcotton25 (cotton, herbicide tolerance, deposited as ATCC PTA-3343, described in WO2003/013224 or US- A 2003-097687); Event LLRICE06 (rice, herbicide tolerance, deposited as ATCC 203353, described in US 6,468,747 or WO2000/026345); Event LLRice62 (rice, herbicide tolerance, deposited as ATCC 203352, described in WO2000/026345), Event LLRICE601 (rice, herbicide tolerance, deposited as ATCC PTA-2600, described in US-A 2008-2289060 or WO2000/026356); Event LY038 (corn, quality trait, deposited
30 as ATCC PTA-5623, described in US-A 2007-028322 or WO2005/061720); Event MIR162 (corn, insect control, deposited as PTA-8166, described in US-A 2009-300784 or WO2007/142840); Event MIR604 (corn, insect control, not deposited, described in US-A 2008-167456 or WO2005/103301); Event MON15985 (cotton, insect control, deposited as ATCC PTA-2516, described in US-A 2004-250317 or WO2002/100163); Event MON810 (corn, insect control, not deposited, described in US-
35 A 2002-102582); Event MON863 (corn, insect control, deposited as ATCC PTA-2605, described in WO2004/011601 or US-A 2006-095986); Event MON87427 (corn, pollination control, deposited as ATCC PTA-7899, described in WO2011/062904); Event MON87460 (corn, stress tolerance,

deposited as ATCC PTA-8910, described in WO2009/111263 or US-A 2011-0138504); Event MON87701 (soybean, insect control, deposited as ATCC PTA- 8194, described in US-A 2009-130071 or WO2009/064652); Event MON87705 (soybean, quality trait - herbicide tolerance, deposited as ATCC PTA-9241, described in US-A 2010-0080887 or WO2010/037016); Event
5 MON87708 (soybean, herbicide tolerance, deposited as ATCC PTA-9670, described in WO2011/034704); Event MON87712 (soybean, yield, deposited as PTA-10296, described in WO2012/051199), Event MON87754 (soybean, quality trait, deposited as ATCC PTA-9385, described in WO2010/024976); Event MON87769 (soybean, quality trait, deposited as ATCC PTA-8911, described in US-A 2011-0067141 or WO2009/102873); Event MON88017 (corn, insect control
10 - herbicide tolerance, deposited as ATCC PTA-5582, described in US-A 2008-028482 or WO2005/059103); Event MON88913 (cotton, herbicide tolerance, deposited as ATCC PTA-4854, described in WO2004/072235 or US-A 2006-059590); Event MON88302 (oilseed rape, herbicide tolerance, deposited as PTA-10955, described in WO2011/153186), Event MON88701 (cotton, herbicide tolerance, deposited as PTA-11754, described in WO2012/134808), Event MON89034
15 (corn, insect control, deposited as ATCC PTA-7455, described in WO 07/140256 or US-A 2008-260932); Event MON89788 (soybean, herbicide tolerance, deposited as ATCC PTA-6708, described in US-A 2006-282915 or WO2006/130436); Event MS1 1 (oilseed rape, pollination control - herbicide tolerance, deposited as ATCC PTA-850 or PTA-2485, described in WO2001/031042); Event MS8 (oilseed rape, pollination control - herbicide tolerance, deposited as ATCC PTA-730, described in
20 WO2001/041558 or US-A 2003-188347); Event NK603 (corn, herbicide tolerance, deposited as ATCC PTA-2478, described in US-A 2007-292854); Event PE-7 (rice, insect control, not deposited, described in WO2008/114282); Event RF3 (oilseed rape, pollination control - herbicide tolerance, deposited as ATCC PTA-730, described in WO2001/041558 or US-A 2003-188347); Event RT73 (oilseed rape, herbicide tolerance, not deposited, described in WO2002/036831 or US-A 2008-
25 070260); Event SYHT0H2 / SYN-000H2-5 (soybean, herbicide tolerance, deposited as PTA-11226, described in WO2012/082548), Event T227-1 (sugar beet, herbicide tolerance, not deposited, described in WO2002/44407 or US-A 2009-265817); Event T25 (corn, herbicide tolerance, not deposited, described in US-A 2001-029014 or WO2001/051654); Event T304-40 (cotton, insect control - herbicide tolerance, deposited as ATCC PTA-8171, described in US-A 2010-077501 or
30 WO2008/122406); Event T342-142 (cotton, insect control, not deposited, described in WO2006/128568); Event TC1507 (corn, insect control - herbicide tolerance, not deposited, described in US-A 2005-039226 or WO2004/099447); Event VIP1034 (corn, insect control - herbicide tolerance, deposited as ATCC PTA-3925, described in WO2003/052073), Event 32316 (corn, insect control-herbicide tolerance, deposited as PTA-11507, described in WO2011/084632), Event 4114
35 (corn, insect control-herbicide tolerance, deposited as PTA-11506, described in W02011/084621), event EE-GM3 / FG72 (soybean, herbicide tolerance, ATCC Accession N° PTA-11041) optionally stacked with event EE-GM1/LL27 or event EE-GM2/LL55 (WO2011/063413A2), event DAS-

68416-4 (soybean, herbicide tolerance, ATCC Accession N° PTA-10442, WO2011/066360A1), event DAS-68416-4 (soybean, herbicide tolerance, ATCC Accession N° PTA-10442, WO2011/066384A1), event DP-040416-8 (corn, insect control, ATCC Accession N° PTA-11508, WO2011/075593A1), event DP-043A47-3 (corn, insect control, ATCC Accession N° PTA-11509, WO2011/075595A1), event DP- 004114-3 (corn, insect control, ATCC Accession N° PTA-11506, WO2011/084621A1), event DP-032316-8 (corn, insect control, ATCC Accession N° PTA-11507, WO2011/084632A1), event MON-88302-9 (oilseed rape, herbicide tolerance, ATCC Accession N° PTA-10955, WO2011/153186A1), event DAS-21606-3 (soybean, herbicide tolerance, ATCC Accession No. PTA-11028, WO2012/033794A2), event MON-87712-4 (soybean, quality trait, ATCC Accession N°. PTA-10296, WO2012/051199A2), event DAS-44406-6 (soybean, stacked herbicide tolerance, ATCC Accession N°. PTA-11336, WO2012/075426A1), event DAS-14536-7 (soybean, stacked herbicide tolerance, ATCC Accession N°. PTA-11335, WO2012/075429A1), event SYN-000H2-5 (soybean, herbicide tolerance, ATCC Accession N°. PTA-11226, WO2012/082548A2), event DP-061061-7 (oilseed rape, herbicide tolerance, no deposit N° available, WO2012071039A1), event DP-073496-4 (oilseed rape, herbicide tolerance, no deposit N° available, US2012131692), event 8264.44.06.1 (soybean, stacked herbicide tolerance, Accession N° PTA-11336, WO2012075426A2), event 8291.45.36.2 (soybean, stacked herbicide tolerance, Accession N°. PTA-11335, WO2012075429A2), event SYHT0H2 (soybean, ATCC Accession N°. PTA-11226, WO2012/082548A2), event MON88701 (cotton, ATCC Accession N° PTA-11754, WO2012/134808A1), event KK179-2 (alfalfa, ATCC Accession N° PTA-11833, WO2013/003558A1), event pDAB8264.42.32.1 (soybean, stacked herbicide tolerance, ATCC Accession N° PTA-11993, WO2013/010094A1), event MZDT09Y (corn, ATCC Accession N° PTA-13025, WO2013/012775A1).

Further, a list of such transgenic event(s) is provided by the United States Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS) and can be found on their website on the world wide web at aphis.usda.gov. For this application, the status of such list as it is/was on the filing date of this application, is relevant.

The genes/events which impart the desired traits in question may also be present in combinations with one another in the transgenic plants. Examples of transgenic plants which may be mentioned are the important crop plants, such as cereals (wheat, rice, triticale, barley, rye, oats), maize, soya beans, potatoes, sugar beet, sugar cane, tomatoes, peas and other types of vegetable, cotton, tobacco, oilseed rape and also fruit plants (with the fruits apples, pears, citrus fruits and grapes), with particular emphasis being given to maize, soya beans, wheat, rice, potatoes, cotton, sugar cane, tobacco and oilseed rape. Traits which are particularly emphasized are the increased resistance of the plants to insects, arachnids, nematodes and slugs and snails, as well as the increased resistance of the plants to one or more herbicides.

Commercially available examples of such plants, plant parts or plant seeds that may be treated with preference in accordance with the invention include commercial products, such as plant seeds, sold or distributed under the GENUITY®, DROUGHTGARD®, SMARTSTAX®, RIB COMPLETE®, ROUNDUP READY®, VT DOUBLE PRO®, VT TRIPLE PRO®, BOLLGARD II®, ROUNDUP
5 READY 2 YIELD®, YIELDGARD®, ROUNDUP READY® 2 XTEN^{DTM}, INTACTA RR2 PRO®, VISTIVE GOLD®, and/or XTENDFLEXTM trade names.

Pathogens

The polymorphic form B of the compound of the formula (I) can preferably be used as fungicide. The abovementioned diseases include:

10 diseases caused by powdery mildew pathogens, for example *Blumeria* species, for example *Blumeria graminis*; *Leveillula* species, for example *Leveillula Taurica*; *Podosphaera* species, for example *Podosphaera leucotricha* or *Podosphaera xanthii*; *Sphaerotheca* species, for example *Sphaerotheca fuliginea*; *Erysiphe* species, for example *Erysiphe betae* and *Erysiphe necator*;

diseases caused by rust disease pathogens, for example *Gymnosporangium* species, for example
15 *Gymnosporangium sabinae*; *Hemileia* species, for example *Hemileia vastatrix*; *Phakopsora* species, for example *Phakopsora pachyrhizi* or *Phakopsora meibomiae*; *Puccinia* species, for example *Puccinia recondita*, *Puccinia graminis* oder *Puccinia striiformis*; *Uromyces* species, for example *Uromyces appendiculatus*;

leaf blotch diseases and leaf wilt diseases caused, for example, by *Alternaria* species, for example
20 *Alternaria solani* or *Alternaria mali* or *Alternaria alternata*; *Cercospora* species, for example *Cercospora beticola*; *Cladosporium* species, for example *Cladosporium cucumerinum*; *Cochliobolus* species, for example *Cochliobolus sativus* (conidial form: *Drechslera*, syn: *Helminthosporium*) or *Cochliobolus miyabeanus*; *Colletotrichum* species, for example *Colletotrichum lindemuthanium* or *Colletotrichum capsica* or *Colletotrichum acutatum*; *Cordana* species for example *Cordana musae*, *Corynespora* species,
25 for example *Corynespora cassiicola*; *Cycloconium* species, for example *Cycloconium oleaginum*; *Diaporthe* species, for example *Diaporthe citri*; *Elsinoe* species, for example *Elsinoe fawcettii*; *Gloeosporium* species, for example *Gloeosporium laeticolor*; *Glomerella* species, for example *Glomerella cingulata*; *Guignardia* species, for example *Guignardia bidwelli*; *Leptosphaeria* species, for example *Leptosphaeria maculans*; *Magnaporthe* species, for example *Magnaporthe grisea*; *Marsonina* species, for
30 example *Marsonina mali*; *Microdochium* species, for example *Microdochium nivale*; *Monilinia* species, for example *Monilinia laxa*; *Mycosphaerella* species, for example *Mycosphaerella graminicola*, *Mycosphaerella arachidicola* or *Mycosphaerella fijiensis*; *Phaeosphaeria* species, for example *Phaeosphaeria nodorum*, *Phyllachora* species, for example *Phyllachora maydis*, *Pyrenophora* species, for example *Pyrenophora teres* or *Pyrenophora tritici repentis*; *Ramularia* species, for example
35 *Ramularia collo-cygni* or *Ramularia areola*; *Rhynchosporium* species, for example *Rhynchosporium*

secalis; *Septoria* species, for example *Septoria apii* or *Septoria lycopersici*; *Setosphaeria* species, for example *Setosphaeria turcica*; *Sclerotinia* species, for example *Sclerotinia sclerotiorum*; *Stagonospora* species, for example *Stagonospora nodorum*; *Stemphylium* species, for example *Stemphylium vesicarium*; *Typhula* species, for example *Typhula incarnata*; *Venturia* species, for example *Venturia inaequalis*;

5 root and stem diseases caused, for example, by *Corticium* species, for example *Corticium graminearum*; *Fusarium* species, for example *Fusarium oxysporum*; *Gaeumannomyces* species, for example *Gaeumannomyces graminis*; *Marsonina* species, for example *Marsonina mali*; *Rhizoctonia* species, for example *Rhizoctonia solani*; *Sarocladium* species, for example *Sarocladium oryzae*; *Sclerotium* species, for example *Sclerotium oryzae*; *Tapesia* species, for example *Tapesia aciformis*; *Thielaviopsis* species,
10 for example *Thielaviopsis basicola*;

ear and panicle diseases (including corn cobs) caused, for example, by *Alternaria* species, for example *Alternaria* spp.; *Aspergillus* species, for example *Aspergillus flavus*; *Cladosporium* species, for example *Cladosporium cladosporioides*; *Claviceps* species, for example *Claviceps purpurea*; *Fusarium* species, for example *Fusarium culmorum*; *Gibberella* species, for example *Gibberella zeae*; *Monographella* species, for example *Monographella nivalis*; *Stagnospora* species, for example *Stagnospora nodorum*;

diseases caused by smut fungi, for example *Sphacelotheca* species, for example *Sphacelotheca reiliana*; *Tilletia* species, for example *Tilletia caries* or *Tilletia controversa*; *Urocystis* species, for example *Urocystis occulta*; *Ustilago* species, for example *Ustilago nuda*;

fruit rot caused, for example, by *Aspergillus* species, for example *Aspergillus flavus*; *Botrytis* species, for example *Botrytis cinerea*; *Monilinia* species, for example *Monilinia laxa*; *Penicillium* species, for example *Penicillium expansum* or *Penicillium purpurogenum*; *Phomopsis* species, for example *Phomopsis viticola*; *Rhizopus* species, for example *Rhizopus stolonifer*; *Sclerotinia* species, for example *Sclerotinia sclerotiorum*; *Verticillium* species, for example *Verticillium albo-atrum*;

seed- and soil-borne rot and wilt diseases, and also diseases of seedlings, caused, for example, by
25 *Alternaria* species, for example *Alternaria brassicicola*; *Aphanomyces* species, for example *Aphanomyces euteiches*; *Ascochyta* species, for example *Ascochyta lentis*; *Aspergillus* species, for example *Aspergillus flavus*; *Cladosporium* species, for example *Cladosporium herbarum*; *Cochliobolus* species, for example *Cochliobolus sativus* (conidial form: *Drechslera*, Bipolaris Syn: *Helminthosporium*); *Colletotrichum* species, for example *Colletotrichum coccodes*; *Fusarium* species, for example *Fusarium culmorum*;
30 *Gibberella* species, for example *Gibberella zeae*; *Macrophomina* species, for example *Macrophomina phaseolina*; *Microdochium* species, for example *Microdochium nivale*; *Monographella* species, for example *Monographella nivalis*; *Penicillium* species, for example *Penicillium expansum*; *Phoma* species, for example *Phoma lingam*; *Phomopsis* species, for example *Phomopsis sojae*; *Pyrenophora* species, for example *Pyrenophora graminea*; *Pyricularia* species, for example *Pyricularia oryzae*; *Rhizoctonia* species, for example *Rhizoctonia solani*; *Rhizopus* species, for example *Rhizopus oryzae*; *Sclerotium*
35

species, for example *Sclerotium rolfsii*; *Septoria* species, for example *Septoria nodorum*; *Typhula* species, for example *Typhula incarnata*; *Verticillium* species, for example *Verticillium dahliae*;

cancers, galls and witches' broom caused, for example, by *Nectria* species, for example *Nectria galligena*;

wilt diseases caused, for example, by *Verticillium* species, for example *Verticillium longisporum*;

5 *Fusarium* species, for example *Fusarium oxysporum*;

deformations of leaves, flowers and fruits caused, for example, by *Exobasidium* species, for example *Exobasidium vexans*; *Taphrina* species, for example *Taphrina deformans*;

degenerative diseases in woody plants, caused, for example, by *Esca* species, for example *Phaeoconiella chlamydospora*, *Phaeoacremonium aleophilum* or *Fomitiporia mediterranea*; *Ganoderma* species, for

10 example *Ganoderma boninense*;

diseases of plant tubers caused, for example, by *Rhizoctonia* species, for example *Rhizoctonia solani*; *Helminthosporium* species, for example *Helminthosporium solani*;

diseases of soya beans:

fungal diseases on leaves, stems, pods and seeds caused, for example, by *Alternaria* leaf spot (*Alternaria*

15 *spec. atrans tenuissima*), *Anthracnose* (*Colletotrichum gloeosporoides dematium var. truncatum*), brown spot

(*Septoria glycines*), *cercospora* leaf spot and blight (*Cercospora kikuchii*), *choanephora* leaf blight

(*Choanephora infundibulifera trisporea* (Syn.)), *dactuliophora* leaf spot (*Dactuliophora glycines*), downy

mildew (*Peronospora manshurica*), *drechslera* blight (*Drechslera glycini*), frog-eye leaf spot (*Cercospora*

sojina), *leptosphaerulina* leaf spot (*Leptosphaerulina trifolii*), *Leveillula* powdery mildew (*Leveillula*

20 *Taurica*), *phyllosticta* leaf spot (*Phyllosticta sojaecola*), pod and stem blight (*Phomopsis sojiae*), powdery

mildew (*Microsphaera diffusa*), *pyrenochaeta* leaf spot (*Pyrenochaeta glycines*), rhizoctonia aerial, foliage,

and web blight (*Rhizoctonia solani*), rust (*Phakopsora pachyrhizi*, *Phakopsora meibomia*), scab (*Sphaceloma*

glycines), *stemphylium* leaf blight (*Stemphylium botryosum*), sudden death syndrome (*Fusarium virguliforme*),

target spot (*Corynespora cassicola*);

25 fungal diseases on roots and the stem base caused, for example, by black root rot (*Calonectria crotalariae*),

charcoal rot (*Macrophomina phaseolina*), fusarium blight or wilt, root rot, and pod and collar rot (*Fusarium*

oxysporum, *Fusarium orthoceras*, *Fusarium semitectum*, *Fusarium equiseti*), mycoleptodiscus root rot

(*Mycleptodiscus terrestris*), neocosmospora (*Neocosmospora vasinfecta*), pod and stem blight (*Diaporthe*

phaseolorum), stem canker (*Diaporthe phaseolorum var. caulivora*), brown stem rot (*Phialophora gregata*),

30 rhizoctonia root rot, stem decay, and damping-off (*Rhizoctonia solani*), sclerotinia stem decay (*Sclerotinia*

sclerotiorum), sclerotinia southern blight (*Sclerotinia rolfsii*), thielaviopsis root rot (*Thielaviopsis basicola*).

Preferably, the present invention relates to the use of the polymorphic form B of the compound of formula (I)

for controlling diseases caused by powdery mildew pathogens, for example *Blumeria* species, for example

Blumeria graminis; *Leveillula* species, for example *Leveillula Taurica*; *Podosphaera* species, for example

Podosphaera leucotricha or *Podosphaera xanthii*; *Sphaerotheca* species, for example *Sphaerotheca fuliginea*; *Erysiphe* species, for example *Erysiphe betae* and *Erysiphe necator*;

diseases caused by rust disease pathogens, for example *Gymnosporangium* species, for example *Gymnosporangium sabinae*; *Hemileia* species, for example *Hemileia vastatrix*; *Phakopsora* species, for example *Phakopsora pachyrhizi* or *Phakopsora meibomia*; *Puccinia* species, for example *Puccinia recondita*, *Puccinia graminis* oder *Puccinia striiformis*; *Uromyces* species, for example *Uromyces appendiculatus*;

leaf blotch diseases and leaf wilt diseases caused, for example, by *Alternaria* species, for example *Alternaria solani* or *Alternaria mali* or *Alternaria alternata*; *Cercospora* species, for example *Cercospora beticola*; *Cladosporium* species, for example *Cladosporium cucumerinum*; *Cochliobolus* species, for example *Cochliobolus sativus* (conidial form: *Drechslera*, syn: *Helminthosporium*) or *Cochliobolus miyabeanus*; *Colletotrichum* species, for example *Colletotrichum lindemuthianum* or *Colletotrichum capsica* or *Colletotrichum acutatum*; *Corynespora* species, for example *Corynespora cassicola*; *Cycloconium* species, for example *Cycloconium oleaginum*; *Diaporthe* species, for example *Diaporthe citri*; *Elsinoe* species, for example *Elsinoe fawcettii*; *Erysiphe* species, for example *Erysiphe betae*; *Gloeosporium* species, for example *Gloeosporium laeticolor*; *Glomerella* species, for example *Glomerella cingulata*; *Guignardia* species, for example *Guignardia bidwelli*; *Leptosphaeria* species, for example *Leptosphaeria maculans*; *Magnaporthe* species, for example *Magnaporthe grisea*; *Marsonina* species, for example *Marsonina mali*; *Microdochium* species, for example *Microdochium nivale*; *Monilinia* species, for example *Monilinia laxa*; *Mycosphaerella* species, for example *Mycosphaerella graminicola*, *Mycosphaerella arachidicola* or *Mycosphaerella fijiensis*; *Phaeosphaeria* species, for example *Phaeosphaeria nodorum*, *Phyllachora* species, for example *Phyllachora maydis*, *Pyrenophora* species, for example *Pyrenophora teres* or *Pyrenophora tritici repentis*; *Ramularia* species, for example *Ramularia collo-cygni* or *Ramularia areola*; *Rhynchosporium* species, for example *Rhynchosporium secalis*; *Septoria* species, for example *Septoria apii* or *Septoria lycopersici*; *Setosphaeria* species, for example *Setosphaeria turcica*; *Sclerotinia* species, for example *Sclerotinia sclerotiorum*; *Stagonospora* species, for example *Stagonospora nodorum*; *Stemphylium* species, for example *Stemphylium vesicarium*; *Typhula* species, for example *Typhula incarnata*; *Venturia* species, for example *Venturia inaequalis*;

root and stem diseases caused, for example, by *Corticium* species, for example *Corticium graminearum*; *Fusarium* species, for example *Fusarium oxysporum*; *Gaeumannomyces* species, for example *Gaeumannomyces graminis*; *Marsonina* species, for example *Marsonina mali*; *Rhizoctonia* species, for example *Rhizoctonia solani*; *Sarocladium* species, for example *Sarocladium oryzae*; *Sclerotium* species, for example *Sclerotium oryzae*; *Tapesia* species, for example *Tapesia aciformis*; *Thielaviopsis* species, for example *Thielaviopsis basicola*;

ear and panicle diseases (including corn cobs) caused, for example, by *Alternaria* species, for example *Alternaria spp.*; *Aspergillus* species, for example *Aspergillus flavus*; *Cladosporium* species, for example

Cladosporium cladosporioides; *Claviceps* species, for example *Claviceps purpurea*; *Fusarium* species, for example *Fusarium culmorum*; *Gibberella* species, for example *Gibberella zeae*; *Monographella* species, for example *Monographella nivalis*; *Stagnospora* species, for example *Stagnospora nodorum*;

diseases caused by smut fungi, for example *Sphacelotheca* species, for example *Sphacelotheca reiliana*;

5 *Tilletia* species, for example *Tilletia caries* or *Tilletia controversa*; *Urocystis* species, for example *Urocystis occulta*; *Ustilago* species, for example *Ustilago nuda*;

fruit rot caused, for example, by *Aspergillus* species, for example *Aspergillus flavus*; *Botrytis* species, for example *Botrytis cinerea*; *Monilinia* species, for example *Monilinia laxa*; *Penicillium* species, for example *Penicillium expansum* or *Penicillium purpurogenum*; *Phomopsis* species, for example *Phomopsis viticola*;

10 *Rhizopus* species, for example *Rhizopus stolonifer*; *Sclerotinia* species, for example *Sclerotinia sclerotiorum*; *Verticillium* species, for example *Verticillium albo-atrum*;

seed- and soil-borne rot and wilt diseases, and also diseases of seedlings, caused, for example, by *Alternaria* species, for example *Alternaria brassicicola*; *Aphanomyces* species, for example *Aphanomyces euteiches*; *Ascochyta* species, for example *Ascochyta lentis*; *Aspergillus* species, for example *Aspergillus*

15 *flavus*; *Cladosporium* species, for example *Cladosporium herbarum*; *Cochliobolus* species, for example *Cochliobolus sativus* (conidial form: *Drechslera*, Bipolaris Syn: *Helminthosporium*); *Colletotrichum* species, for example *Colletotrichum coccodes*; *Fusarium* species, for example *Fusarium culmorum*; *Gibberella* species, for example *Gibberella zeae*; *Macrophomina* species, for example *Macrophomina phaseolina*; *Microdochium* species, for example *Microdochium nivale*; *Monographella* species, for

20 example *Monographella nivalis*; *Penicillium* species, for example *Penicillium expansum*; *Phoma* species, for example *Phoma lingam*; *Phomopsis* species, for example *Phomopsis sojae*; *Pyrenophora* species, for example *Pyrenophora graminea*; *Pyricularia* species, for example *Pyricularia oryzae*; *Rhizoctonia* species, for example *Rhizoctonia solani*; *Rhizopus* species, for example *Rhizopus oryzae*; *Sclerotium* species, for example *Sclerotium rolfsii*; *Septoria* species, for example *Septoria nodorum*; *Typhula* species,

25 for example *Typhula incarnata*; *Verticillium* species, for example *Verticillium dahliae*;

cancers, galls and witches' broom caused, for example, by *Nectria* species, for example *Nectria galligena*;

wilt diseases caused, for example, by *Verticillium* species, for example *Verticillium longisporum*; *Fusarium* species, for example *Fusarium oxysporum*;

deformations of leaves, flowers and fruits caused, for example, by *Exobasidium* species, for example

30 *Exobasidium vexans*; *Taphrina* species, for example *Taphrina deformans*;

degenerative diseases in woody plants, caused, for example, by *Esca* species, for example *Phaeoconiella chlamydospora*, *Phaeoacremonium aleophilum* or *Fomitiporia mediterranea*; *Ganoderma* species, for example *Ganoderma boninense*;

diseases of plant tubers caused, for example, by *Rhizoctonia* species, for example *Rhizoctonia solani*;

35 *Helminthosporium* species, for example *Helminthosporium solani*;

diseases of soya beans:

fungal diseases on leaves, stems, pods and seeds caused, for example, by *Alternaria* leaf spot (*Alternaria spec. atrans tenuissima*), *Anthracnose* (*Colletotrichum gloeosporoides dematium var. truncatum*), brown spot (*Septoria glycines*), *cercospora* leaf spot and blight (*Cercospora kikuchii*), *choanephora* leaf blight (5 *Choanephora infundibulifera trisporea (Syn.)*), *dactuliophora* leaf spot (*Dactuliophora glycines*), downy mildew (*Peronospora manshurica*), *drechslera* blight (*Drechslera glycini*), frog-eye leaf spot (*Cercospora sojina*), *leptosphaerulina* leaf spot (*Leptosphaerulina trifolii*), *Leveillula* powdery mildew (*Leveillula Taurica*), *phyllosticta* leaf spot (*Phyllosticta sojaecola*), pod and stem blight (*Phomopsis sojiae*), powdery mildew (*Microsphaera diffusa*), *pyrenochaeta* leaf spot (*Pyrenochaeta glycines*), *rhizoctonia* aerial, foliage, and web blight (*Rhizoctonia solani*), rust (*Phakopsora pachyrhizi*, *Phakopsora meibomia*), scab (*Sphaceloma* 10 *glycines*), *stemphylium* leaf blight (*Stemphylium botryosum*), sudden death syndrome (*Fusarium virguliforme*), target spot (*Corynespora cassiicola*);

fungal diseases on roots and the stem base caused, for example, by black root rot (*Calonectria crotalariae*), charcoal rot (*Macrophomina phaseolina*), fusarium blight or wilt, root rot, and pod and collar rot (*Fusarium* 15 *oxysporum*, *Fusarium orthoceras*, *Fusarium semitectum*, *Fusarium equiseti*), mycoleptodiscus root rot (*Mycoleptodiscus terrestris*), neocosmospora (*Neocosmospora vasinfecta*), pod and stem blight (*Diaporthe phaseolorum*), stem canker (*Diaporthe phaseolorum var. caulivora*), brown stem rot (*Phialophora gregata*), *rhizoctonia* root rot, stem decay, and damping-off (*Rhizoctonia solani*), sclerotinia stem decay (*Sclerotinia sclerotiorum*), sclerotinia southern blight (*Sclerotinia rolfsii*), thielaviopsis root rot (*Thielaviopsis basicola*).

20 More preferably, the present invention relates to the use of the polymorphic form B of the compound of formula (I) for controlling diseases caused by powdery mildew pathogens, for example *Blumeria* species, for example *Blumeria graminis*; *Leveillula* species, for example *Leveillula Taurica*; *Podosphaera* species, for example *Podosphaera leucotricha* or *Podosphaera xanthii*; *Sphaerotheca* species, for example *Sphaerotheca fuliginea*; *Uncinula* species, for example *Uncinula necator*;

25 leaf blotch diseases and leaf wilt diseases caused, for example, by *Alternaria* species, for example *Alternaria solani* or *Alternaria mali* or *Alternaria alternata*; *Cercospora* species, for example *Cercospora beticola*; *Cladosporium* species, for example *Cladosporium cucumerinum*; *Cochliobolus* species, for example *Cochliobolus sativus* (conidial form: *Drechslera*, syn: *Helminthosporium*) or *Cochliobolus miyabeanus*; *Colletotrichum* species, for example *Colletotrichum lindemuthianum* or *Colletotrichum* 30 *capsica* or *Colletotrichum acutatum*; *Corynespora* species, for example *Corynespora cassiicola*; *Cycloconium* species, for example *Cycloconium oleaginum*; *Diaporthe* species, for example *Diaporthe citri*; *Elsinoe* species, for example *Elsinoe fawcettii*; *Erysiphe* species, for example *Erysiphe betae*; *Gloeosporium* species, for example *Gloeosporium laeticolor*; *Glomerella* species, for example *Glomerella cingulata*; *Guignardia* species, for example *Guignardia bidwelli*; *Leptosphaeria* species, for example 35 *Leptosphaeria maculans*; *Magnaporthe* species, for example *Magnaporthe grisea*; *Marsonina* species, for example *Marsonina mali*; *Microdochium* species, for example *Microdochium nivale*; *Monilinia* species,

- for example *Monilinia laxa*; *Mycosphaerella* species, for example *Mycosphaerella graminicola*, *Mycosphaerella arachidicola* or *Mycosphaerella fijiensis*; *Phaeosphaeria* species, for example *Phaeosphaeria nodorum*; *Pyrenophora* species, for example *Pyrenophora teres* or *Pyrenophora tritici repentis*; *Ramularia* species, for example *Ramularia collo-cygni* or *Ramularia areola*; *Rhynchosporium* species, for example *Rhynchosporium secalis*; *Septoria* species, for example *Septoria apii* or *Septoria lycopersici*; *Setosphaeria* species, for example *Setosphaeria turcica*; *Sclerotinia* species, for example *Sclerotinia sclerotiorum*; *Stagonospora* species, for example *Stagonospora nodorum*; *Stemphylium* species, for example *Stemphylium vesicarium*; *Typhula* species, for example *Typhula incarnata*; *Venturia* species, for example *Venturia inaequalis*;
- 10 root and stem diseases caused, for example, by *Corticium* species, for example *Corticium graminearum*; *Fusarium* species, for example *Fusarium oxysporum*; *Gaeumannomyces* species, for example *Gaeumannomyces graminis*; *Marsonina* species, for example *Marsonina mali*; *Rhizoctonia* species, for example *Rhizoctonia solani*; *Sarocladium* species, for example *Sarocladium oryzae*; *Sclerotium* species, for example *Sclerotium oryzae*; *Tapesia* species, for example *Tapesia aciformis*; *Thielaviopsis* species, for example *Thielaviopsis basicola*;
- 15 ear and panicle diseases (including corn cobs) caused, for example, by *Alternaria* species, for example *Alternaria spp.*; *Aspergillus* species, for example *Aspergillus flavus*; *Cladosporium* species, for example *Cladosporium cladosporioides*; *Claviceps* species, for example *Claviceps purpurea*; *Fusarium* species, for example *Fusarium culmorum*; *Gibberella* species, for example *Gibberella zeae*; *Monographella* species, for example *Monographella nivalis*; *Stagonospora* species, for example *Stagonospora nodorum*;
- 20 fruit rot caused, for example, by *Aspergillus* species, for example *Aspergillus flavus*; *Botrytis* species, for example *Botrytis cinerea*; *Monilinia* species, for example *Monilinia laxa*; *Penicillium* species, for example *Penicillium expansum* or *Penicillium purpurogenum*; *Phomopsis* species, for example *Phomopsis viticola*; *Rhizopus* species, for example *Rhizopus stolonifer*; *Sclerotinia* species, for example *Sclerotinia sclerotiorum*; *Verticillium* species, for example *Verticillium albo-atrum*;
- 25 seed- and soil-borne rot and wilt diseases, and also diseases of seedlings, caused, for example, by *Alternaria* species, for example *Alternaria brassicicola*; *Aphanomyces* species, for example *Aphanomyces euteiches*; *Ascochyta* species, for example *Ascochyta lentis*; *Aspergillus* species, for example *Aspergillus flavus*; *Cladosporium* species, for example *Cladosporium herbarum*; *Cochliobolus* species, for example *Cochliobolus sativus* (conidial form: *Drechslera*, *Bipolaris* Syn: *Helminthosporium*); *Colletotrichum* species, for example *Colletotrichum coccodes*; *Fusarium* species, for example *Fusarium culmorum*; *Gibberella* species, for example *Gibberella zeae*; *Macrophomina* species, for example *Macrophomina phaseolina*; *Microdochium* species, for example *Microdochium nivale*; *Monographella* species, for example *Monographella nivalis*; *Penicillium* species, for example *Penicillium expansum*; *Phoma* species, for example *Phoma lingam*; *Phomopsis* species, for example *Phomopsis sojae*; *Pyrenophora* species, for example *Pyrenophora graminea*; *Pyricularia* species, for example *Pyricularia oryzae*; *Rhizoctonia*
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species, for example *Rhizoctonia solani*; *Rhizopus* species, for example *Rhizopus oryzae*; *Sclerotium* species, for example *Sclerotium rolfsii*; *Septoria* species, for example *Septoria nodorum*; *Typhula* species, for example *Typhula incarnata*; *Verticillium* species, for example *Verticillium dahliae*;

Fusarium species, for example *Fusarium oxysporum*;

5 diseases of soya beans:

fungal diseases on leaves, stems, pods and seeds caused, for example, by *Alternaria* leaf spot (*Alternaria spec. atrans tenuissima*), *Anthracnose* (*Colletotrichum gloeosporoides dematium var. truncatum*), brown spot (*Septoria glycines*), *cercospora* leaf spot and blight (*Cercospora kikuchii*), *choanephora* leaf blight (*Choanephora infundibulifera trispora (Syn.)*), *dactuliophora* leaf spot (*Dactuliophora glycines*), downy
10 mildew (*Peronospora manshurica*), *drechslera* blight (*Drechslera glycini*), frog-eye leaf spot (*Cercospora sojina*), *leptosphaerulina* leaf spot (*Leptosphaerulina trifolii*), *Leveillula* powdery mildew (*Leveillula Taurica*), *phyllosticta* leaf spot (*Phyllosticta sojaecola*), pod and stem blight (*Phomopsis sojiae*), powdery mildew (*Microsphaera diffusa*), *pyrenochaeta* leaf spot (*Pyrenochaeta glycines*), *rhizoctonia* aerial, foliage, and web blight (*Rhizoctonia solani*), scab (*Sphaceloma glycines*), *stemphylium* leaf blight (*Stemphylium
15 botryosum*), sudden death syndrome (*Fusarium virguliforme*), target spot (*Corynespora cassicola*);

fungal diseases on roots and the stem base caused, for example, by black root rot (*Calonectria crotalariae*), charcoal rot (*Macrophomina phaseolina*), *fusarium* blight or wilt, root rot, and pod and collar rot (*Fusarium oxysporum*, *Fusarium orthoceras*, *Fusarium semitectum*, *Fusarium equiseti*), *mycoleptodiscus* root rot (*Mycoleptodiscus terrestris*), *neocosmospora* (*Neocosmospora vasinfecta*), pod and stem blight (*Diaporthe
20 phaseolorum*), stem canker (*Diaporthe phaseolorum var. caulivora*), brown stem rot (*Phialophora gregata*), *rhizoctonia* root rot, stem decay, and damping-off (*Rhizoctonia solani*), *sclerotinia* stem decay (*Sclerotinia sclerotiorum*), *sclerotinia* southern blight (*Sclerotinia rolfsii*), *thielaviopsis* root rot (*Thielaviopsis basicola*).

Most preferably, the present invention relates to the use of the polymorphic form B of the compound of formula (I) for controlling diseases caused by powdery mildew pathogens, *Sphaerotheca* species, for
25 example *Sphaerotheca fuliginea*;

leaf blotch diseases and leaf wilt diseases caused, for example, by *Alternaria* species, for example *Alternaria solani* or *Alternaria mali* or *Alternaria alternata*; *Cercospora* species, for example *Cercospora beticola*; *Colletotrichum* species, for example *Colletotrichum lindemuthianum* or *Colletotrichum capsica* or *Colletotrichum acutatum*; *Diaporthe* species, for example *Diaporthe citri*; *Phaeosphaeria* species, for
30 example *Phaeosphaeria nodorum*; *Pyrenophora* species, for example *Pyrenophora teres* or *Pyrenophora tritici repentis*; *Septoria* species, for example *Septoria apii* or *Septoria lycopersici*;

root and stem diseases caused, for example, *Fusarium* species, for example *Fusarium oxysporum*;

ear and panicle diseases (including corn cobs) caused, for example, by *Alternaria* species, for example *Alternaria spp.*; *Fusarium* species, for example *Fusarium culmorum*;

Botrytis species, for example *Botrytis cinerea*; seed- and soil-borne rot and wilt diseases, and also diseases of seedlings, caused, for example, by *Alternaria* species, for example *Alternaria brassicicola*; *Colletotrichum* species, for example *Colletotrichum coccodes*; *Fusarium* species, for example *Fusarium culmorum*; *Pyrenophora* species, for example *Pyrenophora graminea*; *Pyricularia* species, for example

5 *Pyricularia oryzae*;

Fusarium species, for example *Fusarium oxysporum*.

Mycotoxins

In addition, the polymorphic form B of the compound of formula (I) and composition comprising thereof may reduce the mycotoxin content in the harvested material and the foods and feeds prepared therefrom.

10 Mycotoxins include particularly, but not exclusively, the following: deoxynivalenol (DON), nivalenol, 15-Ac-DON, 3-Ac-DON, T2- and HT2-toxin, fumonisins, zearalenon, moniliformin, fusarin, diaceotoxyscirpenol (DAS), beauvericin, enniatin, fusaroproliferin, fusarenol, ochratoxins, patulin, ergot alkaloids and aflatoxins which can be produced, for example, by the following fungi: *Fusarium* spec., such as *F. acuminatum*, *F. asiaticum*, *F. avenaceum*, *F. crookwellense*, *F. culmorum*, *F. graminearum*

15 (*Gibberella zea*), *F. equiseti*, *F. fujikoroi*, *F. musarum*, *F. oxysporum*, *F. proliferatum*, *F. poae*, *F. pseudograminearum*, *F. sambucinum*, *F. scirpi*, *F. semitectum*, *F. solani*, *F. sporotrichoides*, *F. langsethiae*, *F. subglutinans*, *F. tricinctum*, *F. verticillioides* etc., and also by *Aspergillus* spec., such as *A. flavus*, *A. parasiticus*, *A. nomius*, *A. ochraceus*, *A. clavatus*, *A. terreus*, *A. versicolor*, *Penicillium* spec., such as *P. verrucosum*, *P. viridicatum*, *P. citrinum*, *P. expansum*, *P. claviforme*, *P. roqueforti*,

20 *Claviceps* spec., such as *C. purpurea*, *C. fusiformis*, *C. paspali*, *C. africana*, *Stachybotrys* spec. and others.

Material Protection

The polymorphic form B of the compound of formula (I) and composition comprising thereof may also be used in the protection of materials, especially for the protection of industrial materials against attack and destruction by phytopathogenic fungi.

25 In addition, the polymorphic form B of the compound of formula (I) and composition comprising thereof may be used as antifouling compositions, alone or in combinations with other active ingredients.

Industrial materials in the present context are understood to mean inanimate materials which have been prepared for use in industry. For example, industrial materials which are to be protected from microbial alteration or destruction may be adhesives, glues, paper, wallpaper and board/cardboard, textiles, carpets,

30 leather, wood, fibers and tissues, paints and plastic articles, cooling lubricants and other materials which can be infected with or destroyed by microorganisms. Parts of production plants and buildings, for example cooling-water circuits, cooling and heating systems and ventilation and air-conditioning units, which may be impaired by the proliferation of microorganisms may also be mentioned within the scope of the materials to be protected. Industrial materials within the scope of the present invention preferably include adhesives, sizes,

35 paper and card, leather, wood, paints, cooling lubricants and heat transfer fluids, more preferably wood.

The polymorphic form B of the compound of formula (I) and composition comprising thereof may prevent adverse effects, such as rotting, decay, discoloration, decoloration or formation of mould.

In the case of treatment of wood the polymorphic form B of the compound of formula (I) and composition comprising thereof may also be used against fungal diseases liable to grow on or inside timber.

- 5 Timber means all types of species of wood, and all types of working of this wood intended for construction, for example solid wood, high-density wood, laminated wood, and plywood. In addition, the polymorphic form B of the compound of formula (I) and composition comprising thereof may be used to protect objects which come into contact with saltwater or brackish water, especially hulls, screens, nets, buildings, moorings and signalling systems, from fouling.
- 10 The polymorphic form B of the compound of formula (I) and composition comprising thereof may also be employed for protecting storage goods. Storage goods are understood to mean natural substances of vegetable or animal origin or processed products thereof which are of natural origin, and for which long-term protection is desired. Storage goods of vegetable origin, for example plants or plant parts, such as stems, leaves, tubers, seeds, fruits, grains, may be protected freshly harvested or after processing by (pre)drying, moistening, 15 comminuting, grinding, pressing or roasting. Storage goods also include timber, both unprocessed, such as construction timber, electricity poles and barriers, or in the form of finished products, such as furniture. Storage goods of animal origin are, for example, hides, leather, furs and hairs. The polymorphic form B of the compound of formula (I) and composition comprising thereof may prevent adverse effects, such as rotting, decay, discoloration, decoloration or formation of mould.
- 20 Microorganisms capable of degrading or altering industrial materials include, for example, bacteria, fungi, yeasts, algae and slime organisms. The polymorphic form B of the compound of formula (I) and composition comprising thereof preferably act against fungi, especially moulds, wood-discoloring and wood-destroying fungi (*Ascomycetes*, *Basidiomycetes*, *Deuteromycetes* and *Zygomycetes*), and against slime organisms and algae. Examples include microorganisms of the following genera: *Alternaria*, such as *Alternaria tenuis*; 25 *Aspergillus*, such as *Aspergillus niger*; *Chaetomium*, such as *Chaetomium globosum*; *Coniophora*, such as *Coniophora puetana*; *Lentinus*, such as *Lentinus tigrinus*; *Penicillium*, such as *Penicillium glaucum*; *Polyporus*, such as *Polyporus versicolor*; *Aureobasidium*, such as *Aureobasidium pullulans*; *Sclerophoma*, such as *Sclerophoma pityophila*; *Trichoderma*, such as *Trichoderma viride*; *Ophiostoma spp.*, *Ceratocystis spp.*, *Hemicola spp.*, *Petriella spp.*, *Trichurus spp.*, *Coriolus spp.*, *Gloeophyllum spp.*, *Pleurotus spp.*, *Poria spp.*, *Serpula spp.* and *Tyromyces spp.*, *Cladosporium spp.*, *Paecilomyces spp.* *Mucor spp.*, *Escherichia*, such as *Escherichia coli*; *Pseudomonas*, such as *Pseudomonas aeruginosa*; *Staphylococcus*, such as *Staphylococcus aureus*, *Candida spp.* and *Saccharomyces spp.*, such as *Saccharomyces cerevisiae*. The plant protection agent may additionally comprise one or more further active ingredients like fungicides, bactericides, acaricides, nematicides, insecticides, biological control agents or herbicides. Mixtures with fertilizers, growth 30 regulators, safeners, nitrification inhibitors, semiochemicals and/or other agriculturally beneficial agents are also possible. This may allow to broaden the activity spectrum or to prevent development of resistance.

In a further embodiment the present invention is directed to a plant protection agent comprising the polymorphic form B of the compound of formula (I), which further comprises one or more additional active substance(s) selected from the group consisting of fungicides, insecticides, herbicides, acaricides, safeners and/or plant growth regulator.

- 5 The active compounds identified here by their common names are known and are described, for example, in the pesticide handbook ("The Pesticide Manual" 17th Ed., British Crop Protection Council 2015) or can be found on the Internet(e.g. <http://www.alanwood.net/pesticides>).

Examples of fungicides which could be mixed with the compound and the composition of the invention are:

- 10 1) Inhibitors of the ergosterol biosynthesis, for example (1.001) cyproconazole, (1.002) difenoconazole, (1.003) epoxiconazole, (1.004) fenbuconazole, (1.005) fenhexamid, (1.006) fenpropidin, (1.007) fenpropimorph, (1.008) fenpyrazamine, (1.009) Fluoxytioconazole, (1.010) fluquinconazole, (1.011) flutriafol, (1.012) hexaconazole, (1.013) imazalil, (1.014) imazalil sulfate, (1.015) ipconazole, (1.016) ipfentrifluconazole, (1.017) mefentrifluconazole, (1.018) metconazole, (1.019) myclobutanil, (1.020) paclobutrazol, (1.021) penconazole, (1.022) prochloraz, (1.023) propiconazole, (1.024) prothioconazole, (1.025) pyrisoxazole, (1.026) spiroxamine, (1.027) tebuconazole, (1.028) tetraconazole, (1.029) triadimenol, (1.030) tridemorph, (1.031) triticonazole, (1.032) (1R,2S,5S)-5-(4-chlorobenzyl)-2-(chloromethyl)-2-methyl-1-(1H-1,2,4-triazol-1-ylmethyl)cyclopentanol, (1.033) (1S,2R,5R)-5-(4-chlorobenzyl)-2-(chloromethyl)-2-methyl-1-(1H-1,2,4-triazol-1-ylmethyl)cyclopentanol, (1.034) (2R)-2-(1-chlorocyclopropyl)-4-[(1R)-2,2-dichlorocyclopropyl]-1-(1H-1,2,4-triazol-1-yl)butan-2-ol, (1.035) (2R)-2-(1-chlorocyclopropyl)-4-[(1S)-2,2-dichlorocyclopropyl]-1-(1H-1,2,4-triazol-1-yl)butan-2-ol, (1.036) (2R)-2-[4-(4-chlorophenoxy)-2-(trifluoromethyl)phenyl]-1-(1H-1,2,4-triazol-1-yl)propan-2-ol, (1.037) (2S)-2-(1-chlorocyclopropyl)-4-[(1R)-2,2-dichlorocyclopropyl]-1-(1H-1,2,4-triazol-1-yl)butan-2-ol, (1.038) (2S)-2-(1-chlorocyclopropyl)-4-[(1S)-2,2-dichlorocyclopropyl]-1-(1H-1,2,4-triazol-1-yl)butan-2-ol, (1.039) (2S)-2-[4-(4-chlorophenoxy)-2-(trifluoromethyl)phenyl]-1-(1H-1,2,4-triazol-1-yl)propan-2-ol, (1.040) (R)-[3-(4-chloro-2-fluorophenyl)-5-(2,4-difluorophenyl)-1,2-oxazol-4-yl](pyridin-3-yl)methanol, (1.041) (S)-[3-(4-chloro-2-fluorophenyl)-5-(2,4-difluorophenyl)-1,2-oxazol-4-yl](pyridin-3-yl)methanol, (1.042) [3-(4-chloro-2-fluorophenyl)-5-(2,4-difluorophenyl)-1,2-oxazol-4-yl](pyridin-3-yl)methanol, (1.043) 1-((2R,4S)-2-[2-chloro-4-(4-chlorophenoxy)phenyl]-4-methyl-1,3-dioxolan-2-yl)methyl)-1H-1,2,4-triazole, (1.044) 1-((2S,4S)-2-[2-chloro-4-(4-chlorophenoxy)phenyl]-4-methyl-1,3-dioxolan-2-yl)methyl)-1H-1,2,4-triazole, (1.045) 1-[[3-(2-chlorophenyl)-2-(2,4-difluorophenyl)oxiran-2-yl]methyl]-1H-1,2,4-triazol-5-yl thiocyanate, (1.046) 1-[[rel(2R,3R)-3-(2-chlorophenyl)-2-(2,4-difluorophenyl)oxiran-2-yl]methyl]-1H-1,2,4-triazol-5-yl thiocyanate, (1.047) 1-[[rel(2R,3S)-3-(2-chlorophenyl)-2-(2,4-difluorophenyl)oxiran-2-yl]methyl]-1H-1,2,4-triazol-5-yl thiocyanate, (1.048) 2-[(2R,4R,5R)-1-(2,4-dichlorophenyl)-5-hydroxy-2,6,6-trimethylheptan-4-yl]-2,4-dihydro-3H-1,2,4-triazole-3-thione, (1.049) 2-[(2R,4R,5S)-1-(2,4-dichlorophenyl)-5-hydroxy-2,6,6-
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trimethylheptan-4-yl]-2,4-dihydro-3H-1,2,4-triazole-3-thione, (1.050) 2-[(2R,4S,5R)-1-(2,4-dichlorophenyl)-5-hydroxy-2,6,6-trimethylheptan-4-yl]-2,4-dihydro-3H-1,2,4-triazole-3-thione, (1.051) 2-[(2R,4S,5S)-1-(2,4-dichlorophenyl)-5-hydroxy-2,6,6-trimethylheptan-4-yl]-2,4-dihydro-3H-1,2,4-triazole-3-thione, (1.052) 2-[(2S,4R,5R)-1-(2,4-dichlorophenyl)-5-hydroxy-2,6,6-trimethylheptan-4-yl]-2,4-dihydro-3H-1,2,4-triazole-3-thione, (1.053) 2-[(2S,4R,5S)-1-(2,4-dichlorophenyl)-5-hydroxy-2,6,6-trimethylheptan-4-yl]-2,4-dihydro-3H-1,2,4-triazole-3-thione, (1.054) 2-[(2S,4S,5R)-1-(2,4-dichlorophenyl)-5-hydroxy-2,6,6-trimethylheptan-4-yl]-2,4-dihydro-3H-1,2,4-triazole-3-thione, (1.055) 2-[(2S,4S,5S)-1-(2,4-dichlorophenyl)-5-hydroxy-2,6,6-trimethylheptan-4-yl]-2,4-dihydro-3H-1,2,4-triazole-3-thione, (1.056) 2-[1-(2,4-dichlorophenyl)-5-hydroxy-2,6,6-trimethylheptan-4-yl]-2,4-dihydro-3H-1,2,4-triazole-3-thione, (1.057) 2-[6-(4-bromophenoxy)-2-(trifluoromethyl)-3-pyridyl]-1-(1,2,4-triazol-1-yl)propan-2-ol, (1.058) 2-[6-(4-chlorophenoxy)-2-(trifluoromethyl)-3-pyridyl]-1-(1,2,4-triazol-1-yl)propan-2-ol, (1.059) 2-[[3-(2-chlorophenyl)-2-(2,4-difluorophenyl)oxiran-2-yl]methyl]-2,4-dihydro-3H-1,2,4-triazole-3-thione, (1.060) 2-[[rel(2R,3R)-3-(2-chlorophenyl)-2-(2,4-difluorophenyl)oxiran-2-yl]methyl]-2,4-dihydro-3H-1,2,4-triazole-3-thione, (1.061) 2-[[rel(2R,3S)-3-(2-chlorophenyl)-2-(2,4-difluorophenyl)oxiran-2-yl]methyl]-2,4-dihydro-3H-1,2,4-triazole-3-thione, (1.062) 3-[2-(1-chlorocyclopropyl)-3-(3-chloro-2-fluoro-phenyl)-2-hydroxy-propyl]imidazole-4-carbonitrile, (1.063) 5-(4-chlorobenzyl)-2-(chloromethyl)-2-methyl-1-(1H-1,2,4-triazol-1-ylmethyl)cyclopentanol, (1.064) 5-(allylsulfanyl)-1-[[3-(2-chlorophenyl)-2-(2,4-difluorophenyl)oxiran-2-yl]methyl]-1H-1,2,4-triazole, (1.065) 5-(allylsulfanyl)-1-[[rel(2R,3R)-3-(2-chlorophenyl)-2-(2,4-difluorophenyl)oxiran-2-yl]methyl]-1H-1,2,4-triazole, (1.066) 5-(allylsulfanyl)-1-[[rel(2R,3S)-3-(2-chlorophenyl)-2-(2,4-difluorophenyl)oxiran-2-yl]methyl]-1H-1,2,4-triazole, (1.067) methyl 2-[2-chloro-4-(4-chlorophenoxy)phenyl]-2-hydroxy-3-(1H-1,2,4-triazol-1-yl)propanoate, (1.068) N'-(2,5-dimethyl-4-(2-methylbenzyl)phenyl)-N-ethyl-N-methylformimidamide, (1.069) N'-(2-chloro-4-(4-cyanobenzyl)-5-methylphenyl)-N-ethyl-N-methylformimidamide, (1.070) N'-(2-chloro-4-(4-methoxybenzyl)-5-methylphenyl)-N-ethyl-N-methylformimidamide, (1.071) N'-(2-chloro-5-methyl-4-phenoxyphenyl)-N-ethyl-N-methylimidoforamamide, (1.072) N'-(4-benzyl-2-chloro-5-methylphenyl)-N-ethyl-N-methylformimidamide, (1.073) N'-[2-chloro-4-(2-fluorophenoxy)-5-methylphenyl]-N-ethyl-N-methylimidoforamamide, (1.074) N'-[5-bromo-6-(2,3-dihydro-1H-inden-2-yloxy)-2-methylpyridin-3-yl]-N-ethyl-N-methylimidoforamamide, (1.075) N'-{4-[(4,5-dichloro-1,3-thiazol-2-yl)oxy]-2,5-dimethylphenyl}-N-ethyl-N-methylimidoforamamide, (1.076) N'-{5-bromo-2-methyl-6-[(1-propoxypropan-2-yl)oxy]pyridin-3-yl}-N-ethyl-N-methylimidoforamamide, (1.077) N'-{5-bromo-6-[(1R)-1-(3,5-difluorophenyl)ethoxy]-2-methylpyridin-3-yl}-N-ethyl-N-methylimidoforamamide, (1.078) N'-{5-bromo-6-[(1S)-1-(3,5-difluorophenyl)ethoxy]-2-methylpyridin-3-yl}-N-ethyl-N-methylimidoforamamide, (1.079) N'-{5-bromo-6-[(cis-4-isopropylcyclohexyl)oxy]-2-methylpyridin-3-yl}-N-ethyl-N-methylimidoforamamide, (1.080) N'-{5-bromo-6-[(trans-4-isopropylcyclohexyl)oxy]-2-methylpyridin-3-yl}-N-ethyl-N-methylimidoforamamide, (1.081) N'-{5-bromo-6-[1-(3,5-difluorophenyl)ethoxy]-2-methylpyridin-3-yl}-N-ethyl-N-methylimidoforamamide, (1.082) N-isopropyl-N'-[5-methoxy-2-methyl-4-(2,2,2-trifluoro-1-hydroxy-1-phenylethyl)phenyl]-N-methylimidoforamamide, (1.083) p-tolylmethyl 4-[(E)-[ethyl(methyl)amino]methylenamino]-2,5-dimethyl-benzoate.

2) Inhibitors of the respiratory chain at complex I or II, for example (2.001) benzovindiflupyr, (2.002) bixafen, (2.003) boscalid, (2.004) carboxin, (2.005) cyclobutrifluram, (2.006) flubeneteram, (2.007) fluindapyr, (2.008) fluopyram, (2.009) flutolanil, (2.010) fluxapyroxad, (2.011) furametpyr, (2.012) inpyrfluxam, (2.013) Isofetamid, (2.014) isoflucypram, (2.015) isopyrazam, (2.016) penflufen, (2.017) penthiopyrad, (2.018) pydiflumetofen, (2.019) pyrapropoyne, (2.020) pyraziflumid, (2.021) sedaxane, (2.022) Thifluzamide (aka trifluzamide), (2.023) 5,8-difluoro-N-[2-(2-fluoro-4-{[4-(trifluoromethyl)pyridin-2-yl]oxy}phenyl)ethyl]quinazolin-4-amine, (2.024) 5-chloro-N-[2-[1-(4-chlorophenyl)pyrazol-3-yl]oxyethyl]-6-ethyl-pyrimidin-4-amine, (2.025) N-[2-[1-(4-chlorophenyl)pyrazol-3-yl]oxyethyl]quinazolin-4-amine, (2.026) 1,3-dimethyl-N-(1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl)-1H-pyrazole-4-carboxamide, (2.027) 1,3-dimethyl-N-[(3R)-1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl]-1H-pyrazole-4-carboxamide, (2.028) 1,3-dimethyl-N-[(3S)-1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl]-1H-pyrazole-4-carboxamide, (2.029) 1-methyl-3-(trifluoromethyl)-N-[2'-(trifluoromethyl)biphenyl-2-yl]-1H-pyrazole-4-carboxamide, (2.030) 2-fluoro-6-(trifluoromethyl)-N-(1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl)benzamide, (2.031) 3-(difluoromethyl)-1-methyl-N-(1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl)-1H-pyrazole-4-carboxamide, (2.032) 3-(difluoromethyl)-1-methyl-N-[(3S)-1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl]-1H-pyrazole-4-carboxamide, (2.033) 3-(difluoromethyl)-N-[(3R)-7-fluoro-1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl]-1-methyl-1H-pyrazole-4-carboxamide, (2.034) 3-(difluoromethyl)-N-[(3S)-7-fluoro-1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl]-1-methyl-1H-pyrazole-4-carboxamide, (2.035) N-[(1R,4S)-9-(dichloromethylene)-1,2,3,4-tetrahydro-1,4-methanonaphthalen-5-yl]-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide, (2.036) N-[(1S,4R)-9-(dichloromethylene)-1,2,3,4-tetrahydro-1,4-methanonaphthalen-5-yl]-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide, (2.037) N-[1-(2,4-dichlorophenyl)-1-methoxypropan-2-yl]-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide, (2.038) N-[rac-(1S,2S)-2-(2,4-dichlorophenyl)cyclobutyl]-2-(trifluoromethyl)nicotinamide.

3) Inhibitors of the respiratory chain at complex III, for example (3.001) ametocradin, (3.002) amisulbrom, (3.003) azoxystrobin, (3.004) coumethoxystrobin, (3.005) coumoxystrobin, (3.006) cyazofamid, (3.007) dimoxystrobin, (3.008) enoxastrobin, (3.009) famoxadone, (3.010) fenamidone, (3.011) fempicoxamid, (3.012) florylpicoxamid, (3.013) flufenoxystrobin, (3.014) fluoxastrobin, (3.015) kresoxim-methyl, (3.016) mandestrobin, (3.017) metarylpicoxamid, (3.018) metominostrobin, (3.019) metyltetraprole, (3.020) orysastrobin, (3.021) picoxystrobin, (3.022) pyraclostrobin, (3.023) pyrametostrobin, (3.024) pyraoxystrobin, (3.025) trifloxystrobin, (3.026) (2E)-2-{2-[[[(1E)-1-(3-[[[E]-1-fluoro-2-phenylvinyl]oxy}phenyl)ethylidene]amino]oxy)methyl]phenyl}-2-(methoxyimino)-N-methylacetamide, (3.027) (2E,3Z)-5-[[1-(4-chloro-2-fluorophenyl)-1H-pyrazol-3-yl]oxy]-2-(methoxyimino)-N,3-dimethylpent-3-enamide, (3.028) (2E,3Z)-5-[[1-(4-chlorophenyl)-1H-pyrazol-3-yl]oxy]-2-(methoxyimino)-N,3-dimethylpent-3-enamide, (3.029) (2R)-2-{2-[(2,5-dimethylphenoxy)methyl]phenyl}-2-methoxy-N-methylacetamide, (3.030) (2S)-2-{2-[(2,5-dimethylphenoxy)methyl]phenyl}-2-methoxy-N-methylacetamide, (3.031) (Z,2E)-5-[1-(2,4-dichlorophenyl)pyrazol-3-yl]oxy-2-methoxyimino-N,3-dimethylpent-3-enamide, (3.032) methyl (Z)-2-(5-cyclohexyl-2-methyl-phenoxy)-3-methoxy-prop-2-enoate, (3.033) methyl (Z)-2-(5-cyclopentyl-2-methyl-

phenoxy)-3-methoxy-prop-2-enoate, (3.034) methyl (Z)-3-methoxy-2-[2-methyl-5-(3-propylpyrazol-1-yl)phenoxy]prop-2-enoate, (3.035) methyl (Z)-3-methoxy-2-[2-methyl-5-[3-(trifluoromethyl)pyrazol-1-yl]phenoxy]prop-2-enoate, (3.036) methyl {5-[3-(2,4-dimethylphenyl)-1H-pyrazol-1-yl]-2-methylbenzyl}carbamate, (3.037) [rac-2-(4-bromo-7-fluoro-indol-1-yl)-1-methyl-propyl] (2S)-2-[(3-hydroxy-4-methoxy-pyridine-2-carbonyl)amino]propanoate, (3.038) [rac-2-(7-bromo-4-fluoro-indol-1-yl)-1-methyl-propyl] (2S)-2-[(3-acetoxy-4-methoxy-pyridine-2-carbonyl)amino]propanoate, (3.039) [rac-2-(7-bromoindol-1-yl)-1-methyl-propyl] (2S)-2-[(3-hydroxy-4-methoxy-pyridine-2-carbonyl)amino]propanoate, (3.040) [rac-2-(3,5-dichloro-2-pyridyl)-1-methyl-propyl] (2S)-2-[(3-hydroxy-4-methoxy-pyridine-2-carbonyl)amino]propanoate, (3.041) [(1S)-1-[1-(1-naphthyl)cyclopropyl]ethyl] (2S)-2-[(3-acetoxy-4-methoxy-pyridine-2-carbonyl)amino]propanoate, (3.042) [(1S)-1-[1-(1-naphthyl)cyclopropyl]ethyl] (2S)-2-[(3-hydroxy-4-methoxy-pyridine-2-carbonyl)amino]propanoate, (3.043) [(1S)-1-[1-(1-naphthyl)cyclopropyl]ethyl] (2S)-2-[[3-(acetoxymethoxy)-4-methoxy-pyridine-2-carbonyl]amino]propanoate, (3.044) [2-[[[(1S)-2-[(1RS,2SR)-2-(3,5-dichloro-2-pyridyl)-1-methyl-propoxy]-1-methyl-2-oxo-ethyl]carbonyl]-4-methoxy-3-pyridyl]oxymethyl 2-methylpropanoate, (3.045) N-(3-ethyl-3,5,5-trimethylcyclohexyl)-3-formamido-2-hydroxybenzamide.

4) Inhibitors of the mitosis and cell division, for example (4.001) carbendazim, (4.002) diethofencarb, (4.003) ethaboxam, (4.004) fluopicolide, (4.005) fluopimomide, (4.006) metrafenone, (4.007) pencycuron, (4.008) pyridachlometyl, (4.009) pyriofenone (chlazafenone), (4.010) thiabendazole, (4.011) thiophanate-methyl, (4.012) zoxamide, (4.013) 3-chloro-5-(4-chlorophenyl)-4-(2,6-difluorophenyl)-6-methylpyridazine, (4.014) 3-chloro-5-(6-chloropyridin-3-yl)-6-methyl-4-(2,4,6-trifluorophenyl)pyridazine, (4.015) 4-(2-bromo-4-fluorophenyl)-N-(2,6-difluorophenyl)-1,3-dimethyl-1H-pyrazol-5-amine, (4.016) 4-(2-bromo-4-fluorophenyl)-N-(2-bromo-6-fluorophenyl)-1,3-dimethyl-1H-pyrazol-5-amine, (4.017) 4-(2-bromo-4-fluorophenyl)-N-(2-bromophenyl)-1,3-dimethyl-1H-pyrazol-5-amine, (4.018) 4-(2-bromo-4-fluorophenyl)-N-(2-chloro-6-fluorophenyl)-1,3-dimethyl-1H-pyrazol-5-amine, (4.019) 4-(2-bromo-4-fluorophenyl)-N-(2-chlorophenyl)-1,3-dimethyl-1H-pyrazol-5-amine, (4.020) 4-(2-bromo-4-fluorophenyl)-N-(2-fluorophenyl)-1,3-dimethyl-1H-pyrazol-5-amine, (4.021) 4-(2-chloro-4-fluorophenyl)-N-(2,6-difluorophenyl)-1,3-dimethyl-1H-pyrazol-5-amine, (4.022) 4-(2-chloro-4-fluorophenyl)-N-(2-chloro-6-fluorophenyl)-1,3-dimethyl-1H-pyrazol-5-amine, (4.023) 4-(2-chloro-4-fluorophenyl)-N-(2-chlorophenyl)-1,3-dimethyl-1H-pyrazol-5-amine, (4.024) 4-(2-chloro-4-fluorophenyl)-N-(2-fluorophenyl)-1,3-dimethyl-1H-pyrazol-5-amine, (4.025) 4-(4-chlorophenyl)-5-(2,6-difluorophenyl)-3,6-dimethylpyridazine, (4.026) N-(2-bromo-6-fluorophenyl)-4-(2-chloro-4-fluorophenyl)-1,3-dimethyl-1H-pyrazol-5-amine, (4.027) N-(2-bromophenyl)-4-(2-chloro-4-fluorophenyl)-1,3-dimethyl-1H-pyrazol-5-amine, (4.028) N-(4-chloro-2,6-difluorophenyl)-4-(2-chloro-4-fluorophenyl)-1,3-dimethyl-1H-pyrazol-5-amine.

5) Compounds capable to have a multisite action, for example (5.001) bordeaux mixture, (5.002) captafol, (5.003) captan, (5.004) chlorothalonil, (5.005) copper hydroxide, (5.006) copper naphthenate, (5.007) copper oxide, (5.008) copper oxychloride, (5.009) copper(2+) sulfate, (5.010) dithianon, (5.011) dodine, (5.012)

folpet, (5.013) mancozeb, (5.014) maneb, (5.015) metiram, (5.016) metiram zinc, (5.017) oxine-copper, (5.018) propineb, (5.019) sulfur and sulfur preparations including calcium polysulfide, (5.020) thiram, (5.021) zineb, (5.022) ziram, (5.023) 6-ethyl-5,7-dioxo-6,7-dihydro-5H-pyrrolo[3',4':5,6][1,4]dithiino[2,3-c][1,2]thiazole-3-carbonitrile.

5 6) Compounds capable to induce a host defence, for example (6.001) acibenzolar-S-methyl, (6.002) fosetyl-aluminium, (6.003) fosetyl-calcium, (6.004) fosetyl-sodium, (6.005) isotianil, (6.006) phosphorous acid and its salts, (6.007) probenazole, (6.008) tiadinil.

7) Inhibitors of the amino acid and/or protein biosynthesis, for example (7.001) cyprodinil, (7.002) kasugamycin, (7.003) kasugamycin hydrochloride hydrate, (7.004) oxytetracycline, (7.005) pyrimethanil

10 8) Inhibitors of the ATP production, for example (8.001) silthiofam.

9) Inhibitors of the cell wall synthesis, for example (9.001) benthiavalicarb, (9.002) dimethomorph, (9.003) flumorph, (9.004) iprovalicarb, (9.005) mandipropamid, (9.006) pyrimorph, (9.007) valifenalate, (9.008) (2E)-3-(4-tert-butylphenyl)-3-(2-chloropyridin-4-yl)-1-(morpholin-4-yl)prop-2-en-1-one, (9.009) (2Z)-3-(4-tert-butylphenyl)-3-(2-chloropyridin-4-yl)-1-(morpholin-4-yl)prop-2-en-1-one.

15 10) Inhibitors of the lipid synthesis or transport, or membrane synthesis, for example (10.001) fluoxapiprolin, (10.002) natamycin, (10.003) oxathiapiprolin, (10.004) propamocarb, (10.005) propamocarb hydrochloride, (10.006) propamocarb-fosetyl, (10.007) tolclofos-methyl, (10.008) 1-(4-{4-[(5R)-5-(2,6-difluorophenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)-2-[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]ethanone, (10.009) 1-(4-{4-[(5S)-5-(2,6-difluorophenyl)-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)-2-[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]ethanone, (10.010) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone, (10.011) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-chloro-6-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone, (10.012) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-fluoro-6-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone, (10.013) 2-[(5R)-3-[2-(1-{[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]acetyl}piperidin-4-yl)-1,3-thiazol-4-yl]-4,5-dihydro-1,2-oxazol-5-yl]-3-chlorophenyl methanesulfonate, (10.014) 2-[(5S)-3-[2-(1-{[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]acetyl}piperidin-4-yl)-1,3-thiazol-4-yl]-4,5-dihydro-1,2-oxazol-5-yl]-3-chlorophenyl methanesulfonate, (10.015) 2-[3-[2-(1-{[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]acetyl}piperidin-4-yl)-1,3-thiazol-4-yl]-4,5-dihydro-1,2-oxazol-5-yl]phenyl methanesulfonate, (10.016) 3-[2-(1-{[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]acetyl}piperidin-4-yl)-1,3-thiazol-4-yl]-1,5-dihydro-2,4-benzodioxepin-6-yl methanesulfonate, (10.017) 9-fluoro-3-[2-(1-{[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]acetyl}piperidin-4-yl)-1,3-thiazol-4-yl]-1,5-dihydro-2,4-benzodioxepin-6-yl methanesulfonate, (10.018) 3-[2-(1-{[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]acetyl}piperidin-4-yl)-1,3-thiazol-4-yl]-1,5-dihydro-2,4-

benzodioxepin-6-yl methanesulfonate, (10.019) 3-[2-(1-[[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]acetyl]piperidin-4-yl)-1,3-thiazol-4-yl]-9-fluoro-1,5-dihydro-2,4-benzodioxepin-6-yl methanesulfonate.

11) Inhibitors of the melanin biosynthesis, for example (11.001) tolprocarb, (11.002) tricyclazole.

12) Inhibitors of the nucleic acid synthesis, for example (12.001) benalaxyl, (12.002) benalaxyl-M (kiralaxyl),
5 (12.003) metalaxyl, (12.004) metalaxyl-M (mefenoxam).

13) Inhibitors of the signal transduction, for example (13.001) fludioxonil, (13.002) iprodione, (13.003) procymidone, (13.004) proquinazid, (13.005) quinoxifen, (13.006) vinclozolin.

14) Compounds capable to act as an uncoupler, for example (14.001) fluazinam, (14.002) meptyldinocap.

15) Further compounds, for example (15.001) abscisic acid, (15.002) aminopyrifen, (15.003) benthiazole,
10 (15.004) bethoxazin, (15.005) capsimycin, (15.006) carvone, (15.007) chinomethionat, (15.008) chloroinconazide, (15.009) cufraneb, (15.010) cyflufenamid, (15.011) cymoxanil, (15.012) cyprosulfamide, (15.013) dipymetitron, (15.014) D-tagatose, (15.015) flufenoxadiazam, (15.016) flumetylsulforim, (15.017) flutianil, (15.018) ipflufenquin, (15.019) methyl isothiocyanate, (15.020) mildiomyzin, (15.021) nickel dimethyldithiocarbamate, (15.022) nitrothal-isopropyl, (15.023) oxyfenthiin, (15.024) pentachlorophenol and salts, (15.025) picarbutrazox, (15.026) quinofumelin, (15.027) tebufloquin, (15.028) tecloftalam, (15.029) tolnifanide, (15.030) 2-(6-benzylpyridin-2-yl)quinazoline, (15.031) 2-[6-(3-fluoro-4-methoxyphenyl)-5-methylpyridin-2-yl]quinazoline, (15.032) 2-phenylphenol and salts, (15.033) 4-amino-5-fluoropyrimidin-2-ol (tautomeric form: 4-amino-5-fluoropyrimidin-2(1H)-one), (15.034) 4-oxo-4-[(2-phenylethyl)amino]butanoic acid, (15.035) 5-amino-1,3,4-thiadiazole-2-thiol, (15.036) 5-chloro-N'-phenyl-N'-(prop-2-yn-1-yl)thiophene-2-sulfonohydrazide, (15.037) 5-fluoro-2-[(4-fluorobenzyl)oxy]pyrimidin-4-amine, (15.038) 5-fluoro-2-[(4-methylbenzyl)oxy]pyrimidin-4-amine, (15.039) but-3-yn-1-yl {6-[[{(Z)-(1-methyl-1H-tetrazol-5-yl)(phenyl)methylene]amino}oxy)methyl]pyridin-2-yl}carbamate, (15.040) ethyl (2Z)-3-amino-2-cyano-3-phenylacrylate, (15.041) methyl 2-[acetyl-[2-ethylsulfonyl-4-(trifluoromethyl)benzoyl]amino]-5-(trifluoromethoxy)benzoate, (15.042) N-acetyl-N-[2-bromo-4-(trifluoromethoxy)phenyl]-2-ethylsulfonyl-4-(trifluoromethyl)benzamide, (15.043) phenazine-1-carboxylic acid, (15.044) propyl 3,4,5-trihydroxybenzoate, (15.045) quinolin-8-ol, (15.046) quinolin-8-ol sulfate (2:1), (15.047) (2R)-2-benzyl-N-(8-fluoro-2-methyl-3-quinolyl)-2,4-dimethyl-pentanamide, (15.048) (2S)-2-benzyl-N-(8-fluoro-2-methyl-3-quinolyl)-2,4-dimethyl-pentanamide, (15.049) 1-(4,5-dimethyl-1H-benzimidazol-1-yl)-4,4-difluoro-3,3-dimethyl-3,4-dihydroisoquinoline, (15.050) 1-(4,5-dimethylbenzimidazol-1-yl)-4,4,5-trifluoro-3,3-dimethyl-isoquinoline, (15.051) 1-(5-(fluoromethyl)-6-methyl-pyridin-3-yl)-4,4-difluoro-3,3-dimethyl-3,4-dihydroisoquinoline, (15.052) 1-(5,6-dimethylpyridin-3-yl)-4,4-difluoro-3,3-dimethyl-3,4-dihydroisoquinoline, (15.053) 1-(6-(difluoromethyl)-5-methoxy-pyridin-3-yl)-4,4-difluoro-3,3-dimethyl-3,4-dihydroisoquinoline, (15.054) 1-(6-(difluoromethyl)-5-methyl-pyridin-3-yl)-4,4-difluoro-3,3-dimethyl-3,4-dihydroisoquinoline, (15.055) 1-(6,7-dimethylpyrazolo[1,5-a]pyridin-3-yl)-4,4,5-trifluoro-3,3-

dimethyl-isoquinoline, (15.056) 1-(6,7-dimethylpyrazolo[1,5-a]pyridin-3-yl)-4,4-difluoro-3,3-dimethyl-3,4-dihydroisoquinoline, (15.057) 2-{2-fluoro-6-[(8-fluoro-2-methylquinolin-3-yl)oxy]phenyl}propan-2-ol, (15.058) 3-(4,4,5-trifluoro-3,3-dimethyl-3,4-dihydroisoquinolin-1-yl)quinoline, (15.059) 3-(4,4-difluoro-3,3-dimethyl-3,4-dihydroisoquinolin-1-yl)-8-fluoroquinoline, (15.060) 3-(4,4-difluoro-5,5-dimethyl-4,5-dihydrothieno[2,3-c]pyridin-7-yl)quinoline, (15.061) 3-(5-fluoro-3,3,4,4-tetramethyl-3,4-dihydroisoquinolin-1-yl)quinoline, (15.062) 4,4-difluoro-3,3-dimethyl-1-(4-methylbenzimidazol-1-yl)isoquinoline, (15.063) 4,4-difluoro-3,3-dimethyl-1-(6-methylpyrazolo[1,5-a]pyridin-3-yl)isoquinoline, (15.064) 5-bromo-1-(5,6-dimethylpyridin-3-yl)-3,3-dimethyl-3,4-dihydroisoquinoline, (15.065) 7,8-difluoro-N-[rac-1-benzyl-1,3-dimethyl-butyl]quinoline-3-carboxamide, (15.066) 8-fluoro-3-(5-fluoro-3,3,4,4-tetramethyl-3,4-dihydroisoquinolin-1-yl)-quinoline, (15.067) 8-fluoro-3-(5-fluoro-3,3-dimethyl-3,4-dihydroisoquinolin-1-yl)-quinoline, (15.068) 8-fluoro-N-(4,4,4-trifluoro-2-methyl-1-phenylbutan-2-yl)quinoline-3-carboxamide, (15.069) 8-fluoro-N-[(1R)-1-[(3-fluorophenyl)methyl]-1,3-dimethyl-butyl]quinoline-3-carboxamide, (15.070) 8-fluoro-N-[(1S)-1-[(3-fluorophenyl)methyl]-1,3-dimethyl-butyl]quinoline-3-carboxamide, (15.071) 8-fluoro-N-[(2S)-4,4,4-trifluoro-2-methyl-1-phenylbutan-2-yl]quinoline-3-carboxamide, (15.072) 8-fluoro-N-[rac-1-[(3-fluorophenyl)methyl]-1,3-dimethyl-butyl]quinoline-3-carboxamide, (15.073) 9-fluoro-2,2-dimethyl-5-(quinolin-3-yl)-2,3-dihydro-1,4-benzoxazepine, (15.074) N-(2,4-dimethyl-1-phenylpentan-2-yl)-8-fluoroquinoline-3-carboxamide, (15.075) N-[(1R)-1-benzyl-1,3-dimethyl-butyl]-7,8-difluoroquinoline-3-carboxamide, (15.076) N-[(1S)-1-benzyl-1,3-dimethyl-butyl]-7,8-difluoroquinoline-3-carboxamide, (15.077) N-[(2R)-2,4-dimethyl-1-phenylpentan-2-yl]-8-fluoroquinoline-3-carboxamide, (15.078) rac-2-benzyl-N-(8-fluoro-2-methyl-3-quinolyl)-2,4-dimethyl-pentanamide, (15.079) 1,1-diethyl-3-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]urea, (15.080) 1,3-dimethoxy-1-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]urea, (15.081) 1-[[3-fluoro-4-(5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl)phenyl]methyl]azepan-2-one, (15.082) 1-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]piperidin-2-one, (15.083) 1-methoxy-1-methyl-3-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]urea, (15.084) 1-methoxy-3-methyl-1-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]urea, (15.085) 1-methoxy-3-methyl-1-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]urea, (15.086) 2-(difluoromethyl)-5-[2-[1-(2,6-difluorophenyl)cyclopropoxy]pyrimidin-5-yl]-1,3,4-oxadiazole, (15.087) 2,2-difluoro-N-methyl-2-[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]acetamide, (15.088) 3,3-dimethyl-1-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]piperidin-2-one, (15.089) 3-ethyl-1-methoxy-1-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]urea, (15.090) 4,4-dimethyl-1-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]pyrrolidin-2-one, (15.091) 4,4-dimethyl-2-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]isoxazolidin-3-one, (15.092) 4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl dimethylcarbamate, (15.093) 5,5-dimethyl-2-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]isoxazolidin-3-one, (15.094) 5-[5-(difluoromethyl)-1,3,4-oxadiazol-2-yl]-N-[(1R)-1-(2,6-difluorophenyl)ethyl]pyrimidin-2-amine, (15.095) 5-[5-(difluoromethyl)-1,3,4-oxadiazol-2-yl]-N-[(1R)-1-(2,6-difluorophenyl)propyl]pyrimidin-2-amine, (15.096) 5-[5-(difluoromethyl)-1,3,4-oxadiazol-2-yl]-N-[(1R)-1-

(2-fluorophenyl)ethyl]pyrimidin-2-amine, (15.097) 5-[5-(difluoromethyl)-1,3,4-oxadiazol-2-yl]-N-[(1R)-1-(2-fluorophenyl)ethyl]pyrimidin-2-amine, (15.098) 5-[5-(difluoromethyl)-1,3,4-oxadiazol-2-yl]-N-[(1R)-1-(3,5-difluorophenyl)ethyl]pyrimidin-2-amine, (15.099) 5-[5-(difluoromethyl)-1,3,4-oxadiazol-2-yl]-N-[(1R)-1-phenylethyl]pyrimidin-2-amine, (15.100) 5-[5-(difluoromethyl)-1,3,4-oxadiazol-2-yl]-N-[1-(2-fluorophenyl)cyclopropyl]pyrimidin-2-amine, (15.101) 5-methyl-1-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]pyrrolidin-2-one, (15.102) ethyl 1-{4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]benzyl}-1H-pyrazole-4-carboxylate, (15.103) methyl {4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl}carbamate, (15.104) N-(1-methylcyclopropyl)-4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]benzamide, (15.105) N-(2,4-difluorophenyl)-4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]benzamide, (15.106) N,2-dimethoxy-N-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]propanamide, (15.107) N,N-dimethyl-1-{4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]benzyl}-1H-1,2,4-triazol-3-amine, (15.108) N-[(E)-methoxyimino-methyl]-4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]benzamide, (15.109) N-[(E)-N-methoxy-C-methyl-carbonimidoyl]-4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]benzamide, (15.110) N-[(Z)-methoxyimino-methyl]-4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]benzamide, (15.111) N-[(Z)-N-methoxy-C-methyl-carbonimidoyl]-4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]benzamide, (15.112) N-[[2,3-difluoro-4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]-3,3,3-trifluoro-propanamide, (15.113) N-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]propanamide, (15.114) N-[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]cyclopropanecarboxamide, (15.115) N-{2,3-difluoro-4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]benzyl}butanamide, (15.116) N-{4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]benzyl}cyclopropanecarboxamide, (15.117) N-{4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl}propanamide, (15.118) N-allyl-N-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]acetamide, (15.119) N-allyl-N-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]propanamide, (15.120) N-ethyl-2-methyl-N-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]propanamide, (15.121) N-methoxy-N-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]cyclopropanecarboxamide, (15.122) N-methyl-4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]benzamide, (15.123) N-methyl-4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]benzenecarbothioamide, (15.124) N-methyl-N-phenyl-4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]benzamide.

All named mixing partners of the classes (1) to (15) as described here above can be present in the form of the free compound or, if their functional groups enable this, an agrochemically active salt thereof.

30 The compound and the composition of the invention may also be combined with one or more biological control agents.

As used herein, the term "biological control" is defined as control of harmful organisms such as a phytopathogenic fungi and/or insects and/or acarids and/or nematodes by the use or employment of a biological control agent.

As used herein, the term “biological control agent” is defined as an organism other than the harmful organisms and / or proteins or secondary metabolites produced by such an organism for the purpose of biological control. Mutants of the second organism shall be included within the definition of the biological control agent. The term “mutant” refers to a variant of the parental strain as well as methods for obtaining a mutant or variant in which the pesticidal activity is greater than that expressed by the parental strain. The “parent strain” is defined herein as the original strain before mutagenesis. To obtain such mutants the parental strain may be treated with a chemical such as N-methyl-N'-nitro-N-nitrosoguanidine, ethylmethanesulfone, or by irradiation using gamma, x-ray, or UV-irradiation, or by other means well known to those skilled in the art. Known mechanisms of biological control agents comprise enteric bacteria that control root rot by out-competing fungi for space on the surface of the root. Bacterial toxins, such as antibiotics, have been used to control pathogens. The toxin can be isolated and applied directly to the plant or the bacterial species may be administered so it produces the toxin *in situ*.

A “variant” is a strain having all the identifying characteristics of the NRRL or ATCC Accession Numbers as indicated in this text and can be identified as having a genome that hybridizes under conditions of high stringency to the genome of the NRRL or ATCC Accession Numbers.

“Hybridization” refers to a reaction in which one or more polynucleotides react to form a complex that is stabilized via hydrogen bonding between the bases of the nucleotide residues. The hydrogen bonding may occur by Watson-Crick base pairing, Hoogsteen binding, or in any other sequence-specific manner. The complex may comprise two strands forming a duplex structure, three or more strands forming a multi-stranded complex, a single self-hybridizing strand, or any combination of these. Hybridization reactions can be performed under conditions of different “stringency”. In general, a low stringency hybridization reaction is carried out at about 40°C in 10 X SSC or a solution of equivalent ionic strength/temperature. A moderate stringency hybridization is typically performed at about 50°C in 6 X SSC, and a high stringency hybridization reaction is generally performed at about 60°C in 1 X SSC.

A variant of the indicated NRRL or ATCC Accession Number may also be defined as a strain having a genomic sequence that is greater than 85%, more preferably greater than 90 % or more preferably greater than 95 % sequence identity to the genome of the indicated NRRL or ATCC Accession Number. A polynucleotide or polynucleotide region (or a polypeptide or polypeptide region) has a certain percentage (for example, 80 %, 85 %, 90 %, or 95 %) of “sequence identity” to another sequence means that, when aligned, that percentage of bases (or amino acids) are the same in comparing the two sequences. This alignment and the percent homology or sequence identity can be determined using software programs known in the art, for example, those described in Current Protocols in Molecular Biology (F. M. Ausubel et al., eds., 1987).

NRRL is the abbreviation for the Agricultural Research Service Culture Collection, an international depositary authority for the purposes of depositing microorganism strains under the Budapest treaty on the

international recognition of the deposit of microorganisms for the purposes of patent procedure, having the address National Center for Agricultural Utilization Research, Agricultural Research service, U.S. Department of Agriculture, 1815 North university Street, Peroira, Illinois 61604 USA.

ATCC is the abbreviation for the American Type Culture Collection, an international depository authority
5 for the purposes of depositing microorganism strains under the Budapest treaty on the international recognition of the deposit of microorganisms for the purposes of patent procedure, having the address ATCC Patent Depository, 10801 University Blvd., Manassas, VA 10110 USA.

Examples of biological control agents which may be combined with the compound and the composition of the invention are:

10 (A) Antibacterial agents selected from the group of:

(A1) bacteria, such as (A1.01) *Bacillus subtilis*, in particular strain QST713/AQ713 (available as SERENADE OPTI or SERENADE ASO from Bayer CropScience LP, US, having NRRL Accession No. B21661, U.S. Patent No. 6,060,051); (A1.02) *Bacillus* sp., in particular strain D747 (available as DOUBLE NICKEL[®] from Kumiai Chemical Industry Co., Ltd.), having Accession No. FERM BP-8234,
15 U.S. Patent No. 7,094,592; (A1.03) *Bacillus pumilus*, in particular strain BU F-33, having NRRL Accession No. 50185 (available as part of the CARTISSA[®] product from BASF, EPA Reg. No. 71840-19); (A1.04) *Bacillus subtilis* var. *amyloliquefaciens* strain FZB24 having Accession No. DSM 10271 (available from Novozymes as TAEGRO[®] or TAEGRO[®] ECO (EPA Registration No. 70127-5)); (A1.05) a *Paenibacillus* sp. strain having Accession No. NRRL B-50972 or Accession No. NRRL B-67129, WO
20 2016/154297; (A1.06) *Bacillus subtilis* strain BU1814, (available as VELONDIS[®] PLUS, VELONDIS[®] FLEX and VELONDIS[®] EXTRA from BASF SE); (A1.07) *Bacillus mojavensis* strain R3B (Accession No. NCAIM (P) B001389) (WO 2013/034938) from Certis USA LLC, a subsidiary of Mitsui & Co.; (A1.08) *Bacillus subtilis* CX-9060 from Certis USA LLC, a subsidiary of Mitsui & Co.; (A1.09) *Paenibacillus polymyxa*, in particular strain AC-1 (e.g. TOPSEED[®] from Green Biotech Company Ltd.);
25 (A1.10) *Pseudomonas proradix* (e.g. PRORADIX[®] from Sourcon Padena); (A1.11) *Pantoea agglomerans*, in particular strain E325 (Accession No. NRRL B-21856) (available as BLOOMTIME BIOLOGICAL[™] FD BIOPESTICIDE from Northwest Agri Products); and

(A2) fungi, such as (A2.01) *Aureobasidium pullulans*, in particular blastospores of strain DSM14940, blastospores of strain DSM 14941 or mixtures of blastospores of strains DSM14940 and DSM14941 (e.g.,
30 BOTECTOR[®] and BLOSSOM PROTECT[®] from bio-ferm, CH); (A2.02) *Pseudozyma aphidis* (as disclosed in WO2011/151819 by Yissum Research Development Company of the Hebrew University of Jerusalem); (A2.03) *Saccharomyces cerevisiae*, in particular strains CNCM No. I-3936, CNCM No. I-3937, CNCM No. I-3938 or CNCM No. I-3939 (WO 2010/086790) from Lesaffre et Compagnie, FR;

(B) biological fungicides selected from the group of:

(B1) bacteria, for example (B1.01) *Bacillus subtilis*, in particular strain QST713/AQ713 (available as SERENADE OPTI or SERENADE ASO from Bayer CropScience LP, US, having NRRL Accession No. B21661 and described in U.S. Patent No. 6,060,051); (B1.02) *Bacillus pumilus*, in particular strain
5 QST2808 (available as SONATA® from Bayer CropScience LP, US, having Accession No. NRRL B-30087 and described in U.S. Patent No. 6,245,551); (B1.03) *Bacillus pumilus*, in particular strain GB34 (available as Yield Shield® from Bayer AG, DE); (B1.04) *Bacillus pumilus*, in particular strain BU F-33, having NRRL Accession No. 50185 (available as part of the CARTISSA product from BASF, EPA Reg. No. 71840-19); (B1.05) *Bacillus amyloliquefaciens*, in particular strain D747 (available as Double
10 Nickel™ from from Kumiai Chemical Industry Co., Ltd., having accession number FERM BP-8234, US Patent No. 7,094,592); (B1.06) *Bacillus subtilis* Y1336 (available as BIOBAC® WP from Bion-Tech, Taiwan, registered as a biological fungicide in Taiwan under Registration Nos. 4764, 5454, 5096 and 5277); (B1.07) *Bacillus subtilis* strain MBI 600 (available as SUBTILEX from BASF SE), having Accession Number NRRL B-50595, U.S. Patent No. 5,061,495; (B1.08) *Bacillus subtilis* strain GB03
15 (available as Kodiak® from Bayer AG, DE); (B1.09) *Bacillus subtilis* var. *amyloliquefaciens* strain FZB24 having Accession No. DSM 10271 (available from Novozymes as TAEGRO® or TAEGRO® ECO (EPA Registration No. 70127-5)); (B1.10) *Bacillus mycoides*, isolate J, having Accession No. B-30890 (available as BMJ TGAI® or WG and LifeGard™ from Certis USA LLC, a subsidiary of Mitsui & Co.); (B1.11) *Bacillus licheniformis*, in particular strain SB3086, having Accession No. ATCC 55406, WO
20 2003/000051 (available as ECOGUARD® Biofungicide and GREEN RELEAF™ from Novozymes); (B1.12) a *Paenibacillus* sp. strain having Accession No. NRRL B-50972 or Accession No. NRRL B-67129, WO 2016/154297; (B1.13) *Bacillus subtilis* strain BU1814, (available as VELONDIS® PLUS, VELONDIS® FLEX and VELONDIS® EXTRA from BASF SE); (B1.14) *Bacillus subtilis* CX-9060 from Certis USA LLC, a subsidiary of Mitsui & Co.; (B1.15) *Bacillus amyloliquefaciens* strain F727 (also
25 known as strain MBI110) (NRRL Accession No. B-50768; WO 2014/028521) (STARGUS® from Marrone Bio Innovations); (B1.16) *Bacillus amyloliquefaciens* strain FZB42, Accession No. DSM 23117 (available as RHIZOVITAL® from ABiTEP, DE); (B1.17) *Bacillus licheniformis* FMCH001 and *Bacillus subtilis* FMCH002 (QUARTZO® (WG) and PRESENCE® (WP) from FMC Corporation); (B1.18) *Bacillus mojavensis* strain R3B (Accession No. NCAIM (P) B001389) (WO 2013/034938) from Certis
30 USA LLC, a subsidiary of Mitsui & Co.; (B1.19) *Paenibacillus polymyxa* ssp. *plantarum* (WO 2016/020371) from BASF SE; (B1.20) *Paenibacillus epiphyticus* (WO 2016/020371) from BASF SE; (B1.21) *Pseudomonas chlororaphis* strain AFS009, having Accession No. NRRL B-50897, WO 2017/019448 (e.g., HOWLER™ and ZIO® from AgBiome Innovations, US); (B1.22) *Pseudomonas chlororaphis*, in particular strain MA342 (e.g. CEDOMON®, CERALL®, and CEDRESS® by Bioagri and
35 Koppert); (B1.23) *Streptomyces lydicus* strain WYEC108 (also known as *Streptomyces lydicus* strain WYCD108US) (ACTINO-IRON® and ACTINOVATE® from Novozymes); (B1.24) *Agrobacterium radiobacter* strain K84 (e.g. GALLTROL-A® from AgBioChem, CA); (B1.25) *Agrobacterium*

radiobacter strain K1026 (e.g. NOGALL™ from BASF SE); (B1.26) *Bacillus subtilis* KTSB strain (FOLIACTIVE® from Donaghys); (B1.27) *Bacillus subtilis* IAB/BS03 (AVIV™ from STK Bio-Ag Technologies); (B1.28) *Bacillus subtilis* strain Y1336 (available as BIOBAC® WP from Bion-Tech, Taiwan, registered as a biological fungicide in Taiwan under Registration Nos. 4764, 5454, 5096 and 5277); (B1.29) *Bacillus amyloliquefaciens* isolate B246 (e.g. AVOGREEN™ from University of Pretoria); (B1.30) *Bacillus methylotrophicus* strain BAC-9912 (from Chinese Academy of Sciences' Institute of Applied Ecology); (B1.31) *Pseudomonas proradix* (e.g. PRORADIX® from Sourcon Padena); (B1.32) *Streptomyces griseoviridis* strain K61 (also known as *Streptomyces galbus* strain K61) (Accession No. DSM 7206) (MYCOSTOP® from Verdera; PREFENCE® from BioWorks; cf. Crop Protection 2006, 25, 468-475); (B1.33) *Pseudomonas fluorescens* strain A506 (e.g. BLIGHTBAN® A506 by NuFarm); and

(B2) fungi, for example: (B2.01) *Coniothyrium minitans*, in particular strain CON/M/91-8 (Accession No. DSM-9660; e.g. Contans ® from Bayer CropScience Biologics GmbH); (B2.02) *Metschnikowia fructicola*, in particular strain NRRL Y-30752; (B2.03) *Microsphaeropsis ochracea*; (B2.04) *Trichoderma atroviride*, in particular strain SC1 (having Accession No. CBS 122089, WO 2009/116106 and U.S. Patent No. 8,431,120 (from Bi-PA)), strain 77B (T77 from Andermatt Biocontrol) or strain LU132 (e.g. Sentinel from Agrimm Technologies Limited); (B2.05) *Trichoderma harzianum* strain T-22 (e.g. Trianum-P from Andermatt Biocontrol or Koppert) or strain Cepa Simb-T5 (from Simbiose Agro); (B2.06) *Gliocladium roseum* (also known as *Clonostachys rosea f. rosea*), in particular strain 321U from Adjuvants Plus, strain ACM941 as disclosed in Xue (Efficacy of *Clonostachys rosea* strain ACM941 and fungicide seed treatments for controlling the root rot complex of field pea, Can Jour Plant Sci 83(3): 519-524), or strain IK726 (Jensen DF, et al. Development of a biocontrol agent for plant disease control with special emphasis on the near commercial fungal antagonist *Clonostachys rosea* strain 'IK726'; Australas Plant Pathol. 2007;36:95–101); (B2.07) *Talaromyces flavus*, strain V117b; (B2.08) *Trichoderma viride*, in particular strain B35 (Pietr et al., 1993, Zesz. Nauk. A R w Szczecinie 161: 125-137); (B2.09) *Trichoderma asperellum*, in particular strain SKT-1, having Accession No. FERM P-16510 (e.g. ECO-HOPE® from Kumiai Chemical Industry), strain T34 (e.g. T34 Biocontrol by Biocontrol Technologies S.L., ES) or strain ICC 012 from Isagro; (B2.10) *Trichoderma atroviride*, strain CNCM I-1237 (e.g. Esquive® WP from Agrauxine, FR); (B2.11) *Trichoderma atroviride*, strain no. V08/002387; (B2.12) *Trichoderma atroviride*, strain NMI no. V08/002388; (B2.13) *Trichoderma atroviride*, strain NMI no. V08/002389; (B2.14) *Trichoderma atroviride*, strain NMI no. V08/002390; (B2.15) *Trichoderma atroviride*, strain LC52 (e.g. Tenet by Agrimm Technologies Limited); (B2.16) *Trichoderma atroviride*, strain ATCC 20476 (IMI 206040); (B2.17) *Trichoderma atroviride*, strain T11 (IMI352941/ CECT20498); (B2.18) *Trichoderma harmatum*; (B2.19) *Trichoderma harzianum*; (B2.20) *Trichoderma harzianum rifai T39* (e.g. Trichodex® from Makhteshim, US); (B2.21) *Trichoderma asperellum*, in particular, strain kd (e.g. T-Gro from Andermatt Biocontrol); (B2.22) *Trichoderma harzianum*, strain ITEM 908 (e.g. Trianum-P from Koppert); (B2.23) *Trichoderma harzianum*, strain TH35 (e.g. Root-Pro by Mycontrol); (B2.24) *Trichoderma virens* (also known as *Gliocladium virens*), in particular strain GL-21 (e.g. SoilGard by

Certis, US); (B2.25) *Trichoderma viride*, strain TV1 (e.g. Triatum-P by Koppert); (B2.26) *Ampelomyces quisqualis*, in particular strain AQ 10 (e.g. AQ 10® by IntrachemBio Italia); (B2.27) *Aureobasidium pullulans*, in particular blastospores of strain DSM14940; (B2.28) *Aureobasidium pullulans*, in particular blastospores of strain DSM 14941; (B2.29) *Aureobasidium pullulans*, in particular mixtures of blastospores of strains DSM14940 and DSM 14941 (e.g. Botector® by bio-ferm, CH); (B2.30) *Cladosporium cladosporioides*, strain H39, having Accession No. CBS122244, US 2010/0291039 (by Stichting Dienst Landbouwkundig Onderzoek); (B2.31) *Gliocladium catenulatum* (Synonym: *Clonostachys rosea f. catenulate*) strain J1446 (e.g. Prestop ® by Lallemand); (B2.32) *Lecanicillium lecanii* (formerly known as *Verticillium lecanii*) conidia of strain KV01 (e.g. Vertalec® by Koppert/Arysta); (B2.33) *Penicillium vermiculatum*; (B2.34) *Pichia anomala*, strain WRL-076 (NRRL Y-30842), U.S. Patent No. 7,579,183; (B2.35) *Trichoderma atroviride*, strain SKT-1 (FERM P-16510), JP Patent Publication (Kokai) 11-253151 A; (B2.36) *Trichoderma atroviride*, strain SKT-2 (FERM P-16511), JP Patent Publication (Kokai) 11-253151 A; (B2.37) *Trichoderma atroviride*, strain SKT-3 (FERM P-17021), JP Patent Publication (Kokai) 11-253151 A; (B2.38) *Trichoderma gamsii* (formerly *T. viride*), strain ICC080 (IMI CC 392151 CABI, e.g. BioDerma by AGROBIOSOL DE MEXICO, S.A. DE C.V.); (B2.39) *Trichoderma harzianum*, strain DB 103 (available as T-GRO® 7456 by Dagutat Biolab); (B2.40) *Trichoderma polysporum*, strain IMI 206039 (e.g. Binab TF WP by BINAB Bio-Innovation AB, Sweden); (B2.41) *Trichoderma stromaticum*, having Accession No. Ts3550 (e.g. Tricovab by CEPLAC, Brazil); (B2.42) *Ulocladium oudemansii* strain U3, having Accession No. NM 99/06216 (e.g., BOTRYZEN® by Botry-Zen Ltd, New Zealand and BOTRYSTOP® from BioWorks, Inc.); (B2.43) *Verticillium albo-atrum* (formerly *V. dahliae*), strain WCS850 having Accession No. WCS850, deposited at the Central Bureau for Fungi Cultures (e.g., DUTCH TRIG® by Tree Care Innovations); (B2.44) *Verticillium chlamydosporium*; (B2.45) mixtures of *Trichoderma asperellum* strain ICC 012 (also known as *Trichoderma harzianum* ICC012), having Accession No. CABI CC IMI 392716 and *Trichoderma gamsii* (formerly *T. viride*) strain ICC 080, having Accession No. IMI 392151 (e.g., BIO-TAM™ from Isagro USA, Inc. and BIODERMA® by Agrobiosol de Mexico, S.A. de C.V.); (B2.46) *Trichoderma asperelloides* JM41R (Accession No. NRRL B-50759) (TRICHO PLUS® from BASF SE); (B2.47) *Aspergillus flavus* strain NRRL 21882 (products known as AFLA-GUARD® from Syngenta/ChemChina); (B2.48) *Chaetomium cupreum* (Accession No. CABI 353812) (e.g. BOKUPRUM™ by AgriLife); (B2.49) *Saccharomyces cerevisiae*, in particular strain LASO2 (from Agro-Levures et Dérivés), strain LAS117 cell walls (CEREVISANE® from Lesaffre; ROMEO® from BASF SE), strains CNCM No. I-3936, CNCM No. I-3937, CNCM No. I-3938, CNCM No. I-3939 (WO 2010/086790) from Lesaffre et Compagnie, FR; (B2.50) *Trichoderma virens* strain G-41, formerly known as *Gliocladium virens* (Accession No. ATCC 20906) (e.g., ROOTSHIELD® PLUS WP and TURFSHIELD® PLUS WP from BioWorks, US); (B2.51) *Trichoderma hamatum*, having Accession No. ATCC 28012; (B2.52) *Ampelomyces quisqualis* strain AQ10, having Accession No. CNCM I-807 (e.g., AQ 10® by IntrachemBio Italia); (B2.53) *Phlebiopsis gigantea* strain VRA 1992 (ROTSTOP® C from Danstar Ferment); (B2.54)

- Penicillium steckii* (DSM 27859; WO 2015/067800) from BASF SE; (B2.55) *Chaetomium globosum* (available as RIVADIOM[®] by Rivale); (B2.56) *Cryptococcus flavescens*, strain 3C (NRRL Y-50378); (B2.57) *Dactylaria candida*; (B2.58) *Dilophosphora alopecuri* (available as TWIST FUNGUS[®]); (B2.59) *Fusarium oxysporum*, strain Fo47 (available as FUSACLEAN[®] by Natural Plant Protection); (B2.60)
- 5 *Pseudozyma flocculosa*, strain PF-A22 UL (available as SPORODEX[®] L by Plant Products Co., CA); (B2.61) *Trichoderma gamsii* (formerly *T. viride*), strain ICC 080 (IMI CC 392151 CABI) (available as BIODERMA[®] by AGROBIOSOL DE MEXICO, S.A. DE C.V.); (B2.62) *Trichoderma fertile* (e.g. product TrichoPlus from BASF); (B2.63) *Muscodor roseus*, in particular strain A3-5 (Accession No. NRRL 30548); (B2.64) *Simplicillium lanosoniveum*;
- 10 (C) biological control agents having an effect for improving plant growth and/or plant health which may be combined in the compound combinations according to the invention including
- (C1) bacteria selected from the group consisting of (C1.01) *Bacillus pumilus*, in particular strain QST2808 (having Accession No. NRRL No. B-30087); (C1.02) *Bacillus subtilis*, in particular strain QST713/AQ713 (having NRRL Accession No. B-21661 and described in U.S. Patent No. 6,060,051;
- 15 available as SERENADE[®] OPTI or SERENADE[®] ASO from Bayer CropScience LP, US); (C1.03) *Bacillus subtilis*, in particular strain AQ30002 (having Accession Nos. NRRL B-50421 and described in U.S. Patent Application No. 13/330,576); (C1.04) *Bacillus subtilis*, in particular strain AQ30004 (and NRRL B-50455 and described in U.S. Patent Application No. 13/330,576); (C1.05) *Sinorhizobium meliloti* strain NRG-185-1 (NITRAGIN[®] GOLD from Bayer CropScience); (C1.06) *Bacillus subtilis*
- 20 strain BU1814, (available as TEQUALIS[®] from BASF SE); (C1.07) *Bacillus subtilis* rm303 (RHIZOMAX[®] from Biofilm Crop Protection); (C1.08) *Bacillus amyloliquefaciens* pm414 (LOLIPEPTA[®] from Biofilm Crop Protection); (C1.09) *Bacillus mycoides* BT155 (NRRL No. B-50921), (C1.10) *Bacillus mycoides* EE118 (NRRL No. B-50918), (C1.11) *Bacillus mycoides* EE141 (NRRL No. B-50916), (C1.12) *Bacillus mycoides* BT46-3 (NRRL No. B-50922), (C1.13) *Bacillus cereus* family
- 25 member EE128 (NRRL No. B-50917), (C1.14) *Bacillus thuringiensis* BT013A (NRRL No. B-50924) also known as *Bacillus thuringiensis* 4Q7, (C1.15) *Bacillus cereus* family member EE349 (NRRL No. B-50928), (C1.16) *Bacillus amyloliquefaciens* SB3281 (ATCC # PTA-7542; WO 2017/205258), (C1.17) *Bacillus amyloliquefaciens* TJ1000 (available as QUIKROOTS[®] from Novozymes); (C1.18) *Bacillus firmus*, in particular strain CNMC I-1582 (e.g. VOTIVO[®] from BASF SE); (C1.19) *Bacillus pumilus*, in
- 30 particular strain GB34 (e.g. YIELD SHIELD[®] from Bayer Crop Science, DE); (C1.20) *Bacillus amyloliquefaciens*, in particular strain IN937a; (C1.21) *Bacillus amyloliquefaciens*, in particular strain FZB42 (e.g. RHIZOVITAL[®] from ABiTEP, DE); (C1.22) *Bacillus amyloliquefaciens* BS27 (Accession No. NRRL B-5015); (C1.23) a mixture of *Bacillus licheniformis* FMCH001 and *Bacillus subtilis* FMCH002 (available as QUARTZO[®] (WG), PRESENCE[®] (WP) from FMC Corporation); (C1.24)
- 35 *Bacillus cereus*, in particular strain BP01 (ATCC 55675; e.g. MEPICHLOR[®] from Arysta Lifescience, US); (C1.25) *Bacillus subtilis*, in particular strain MBI 600 (e.g. SUBTILEX[®] from BASF SE); (C1.26)

Bradyrhizobium japonicum (e.g. OPTIMIZE® from Novozymes); (C1.27) *Mesorhizobium cicer* (e.g., NODULATOR from BASF SE); (C1.28) *Rhizobium leguminosarium biovar viciae* (e.g., NODULATOR from BASF SE); (C1.29) *Delftia acidovorans*, in particular strain RAY209 (e.g. BIOBOOST® from Brett Young Seeds); (C1.30) *Lactobacillus sp.* (e.g. LACTOPLANT® from LactoPAFI); (C1.31) *Paenibacillus polymyxa*, in particular strain AC-1 (e.g. TOPSEED® from Green Biotech Company Ltd.); (C1.32) *Pseudomonas proradix* (e.g. PRORADIX® from Sourcon Padena); (C1.33) *Azospirillum brasilense* (e.g., VIGOR® from KALO, Inc.); (C1.34) *Azospirillum lipoferum* (e.g., VERTEX-IF™ from TerraMax, Inc.); (C1.35) a mixture of *Azotobacter vinelandii* and *Clostridium pasteurianum* (available as INVIGORATE® from Agrinos); (C1.36) *Pseudomonas aeruginosa*, in particular strain PN1; (C1.37) *Rhizobium leguminosarum*, in particular *bv. viceae* strain Z25 (Accession No. CECT 4585); (C1.38) *Azorhizobium caulinodans*, in particular strain ZB-SK-5; (C1.39) *Azotobacter chroococcum*, in particular strain H23; (C1.40) *Azotobacter vinelandii*, in particular strain ATCC 12837; (C1.41) *Bacillus siamensis*, in particular strain KCTC 13613T; (C1.42) *Bacillus tequilensis*, in particular strain NII-0943; (C1.43) *Serratia marcescens*, in particular strain SRM (Accession No. MTCC 8708); (C1.44) *Thiobacillus sp.* (e.g. CROPAID® from Cropaid Ltd UK); and

(C2) fungi selected from the group consisting of (C2.01) *Purpureocillium lilacinum* (previously known as *Paecilomyces lilacinus*) strain 251 (AGAL 89/030550; e.g. BioAct from Bayer CropScience Biologics GmbH); (C2.02) *Penicillium bilaii*, strain ATCC 22348 (e.g. JumpStart® from Acceleron BioAg), (C2.03) *Talaromyces flavus*, strain V117b; (C2.04) *Trichoderma atroviride* strain CNCM I-1237 (e.g. Esquive® WP from Agrauxine, FR), (C2.05) *Trichoderma viride*, e.g. strain B35 (Pietr et al., 1993, Zesz. Nauk. A R w Szczecinie 161: 125-137); (C2.06) *Trichoderma atroviride* strain LC52 (also known as *Trichoderma atroviride* strain LU132; e.g. Sentinel from Agrimm Technologies Limited); (C2.07) *Trichoderma atroviride* strain SC1 described in International Application No. PCT/IT2008/000196); (C2.08) *Trichoderma asperellum* strain kd (e.g. T-Gro from Andermatt Biocontrol); (C2.09) *Trichoderma asperellum* strain Eco-T (Plant Health Products, ZA); (C2.10) *Trichoderma harzianum* strain T-22 (e.g. Trianum-P from Andermatt Biocontrol or Koppert); (C2.11) *Myrothecium verrucaria* strain AARC-0255 (e.g. DiTera™ from Valent Biosciences); (C2.12) *Penicillium bilaii* strain ATCC ATCC20851; (C2.13) *Pythium oligandrum* strain M1 (ATCC 38472; e.g. Polyversum from Bioprepaty, CZ); (C2.14) *Trichoderma virens* strain GL-21 (e.g. SoilGard® from Certis, USA); (C2.15) *Verticillium albo-atrum* (formerly *V. dahliae*) strain WCS850 (CBS 276.92; e.g. Dutch Trig from Tree Care Innovations); (C2.16) *Trichoderma atroviride*, in particular strain no. V08/002387, strain no. NMI No. V08/002388, strain no. NMI No. V08/002389, strain no. NMI No. V08/002390; (C2.17) *Trichoderma harzianum* strain ITEM 908; (C2.18) *Trichoderma harzianum*, strain TSTh20; (C2.19) *Trichoderma harzianum* strain 1295-22; (C2.20) *Pythium oligandrum* strain DV74; (C2.21) *Rhizopogon amylopogon* (e.g. comprised in Myco-Sol from Helena Chemical Company); (C2.22) *Rhizopogon fulvigleba* (e.g. comprised in Myco-Sol from Helena Chemical Company); and (C2.23) *Trichoderma virens* strain GI-3;

(D) insecticidally active biological control agents selected from

(D1) bacteria selected from the group consisting of (D1.01) *Bacillus thuringiensis subsp. aizawai*, in particular strain ABTS-1857 (SD-1372; e.g. XENTARI® from Valent BioSciences); (D1.02) *Bacillus mycoides*, isolate J. (e.g. BmJ from Certis USA LLC, a subsidiary of Mitsui & Co.); (D1.03) *Bacillus sphaericus*, in particular Serotype H5a5b strain 2362 (strain ABTS-1743) (e.g. VECTOLEX® from Valent BioSciences, US); (D1.04) *Bacillus thuringiensis subsp. kurstaki* strain BMP 123 from Becker Microbial Products, IL; (D1.05) *Bacillus thuringiensis subsp. aizawai*, in particular serotype H-7 (e.g. FLORBAC® WG from Valent BioSciences, US); (D1.06) *Bacillus thuringiensis subsp. kurstaki* strain HD-1 (e.g. DIPEL® ES from Valent BioSciences, US); (D1.07) *Bacillus thuringiensis subsp. kurstaki* strain BMP 123 by Becker Microbial Products, IL; (D1.08) *Bacillus thuringiensis israelensis* strain BMP 144 (e.g. AQUABAC® by Becker Microbial Products IL); (D1.09) *Burkholderia spp.*, in particular *Burkholderia rinojensis* strain A396 (also known as *Burkholderia rinojensis* strain MBI 305) (Accession No. NRRL B-50319; WO 2011/106491 and WO 2013/032693; e.g. MBI-206 TGAI and ZELTO® from Marrone Bio Innovations); (D1.10) *Chromobacterium subtsugae*, in particular strain PRAA4-1T (MBI-203; e.g. GRANDEVO® from Marrone Bio Innovations); (D1.11) *Paenibacillus popilliae* (formerly *Bacillus popilliae*; e.g. MILKY SPORE POWDER™ and MILKY SPORE GRANULAR™ from St. Gabriel Laboratories); (D1.12) *Bacillus thuringiensis subsp. israelensis* (serotype H-14) strain AM65-52 (Accession No. ATCC 1276) (e.g. VECTOBAAC® by Valent BioSciences, US); (D1.13) *Bacillus thuringiensis var. kurstaki* strain EVB-113-19 (e.g., BIOPROTEC® from AEF Global); (D1.14) *Bacillus thuringiensis subsp. tenebrionis* strain NB 176 (SD-5428; e.g. NOVODOR® FC from BioFa DE); (D1.15) *Bacillus thuringiensis var. japonensis* strain Buihui; (D1.16) *Bacillus thuringiensis subsp. kurstaki* strain ABTS 351; (D1.17) *Bacillus thuringiensis subsp. kurstaki* strain PB 54; (D1.18) *Bacillus thuringiensis subsp. kurstaki* strain SA 11; (D1.19) *Bacillus thuringiensis subsp. kurstaki* strain SA 12; (D1.20) *Bacillus thuringiensis subsp. kurstaki* strain EG 2348; (D1.21) *Bacillus thuringiensis var. Colmeri* (e.g. TIANBAOBTC by Changzhou Jianghai Chemical Factory); (D1.22) *Bacillus thuringiensis subsp. aizawai* strain GC-91; (D1.23) *Serratia entomophila* (e.g. INVADE® by Wrightson Seeds); (D1.24) *Serratia marcescens*, in particular strain SRM (Accession No. MTCC 8708); and (D1.25) *Wolbachia pipientis* ZAP strain (e.g., ZAP MALES® from MosquitoMate); and

(D2) fungi selected from the group consisting of (D2.01) *Isaria fumosorosea* (previously known as *Paecilomyces fumosoroseus*) strain apopka 97; (D2.02) *Beauveria bassiana* strain ATCC 74040 (e.g. NATURALIS® from Intrachem Bio Italia); (D2.03) *Beauveria bassiana* strain GHA (Accession No. ATCC74250; e.g. BOTANIGUARD® ES and MYCONTROL-O® from Laverlam International Corporation); (D2.04) *Zoophtora radicans*; (D2.05) *Metarhizium robertsii* 15013-1 (deposited under NRRL accession number 67073), (D2.06) *Metarhizium robertsii* 23013-3 (deposited under NRRL accession number 67075), and (D2.07) *Metarhizium anisopliae* 3213-1 (deposited under NRRL accession

number 67074) (WO 2017/066094; Pioneer Hi-Bred International); (D2.08) *Beauveria bassiana* strain ATP02 (Accession No. DSM 24665);

(E) viruses selected from the group consisting of *Adoxophyes orana* (summer fruit tortrix) granulosis virus (GV), *Cydia pomonella* (codling moth) granulosis virus (GV), *Helicoverpa armigera* (cotton bollworm) nuclear polyhedrosis virus (NPV), *Spodoptera exigua* (beet armyworm) mNPV, *Spodoptera frugiperda* (fall armyworm) mNPV, and *Spodoptera littoralis* (African cotton leafworm) NPV;

(F) bacteria and fungi which can be added as 'inoculant' to plants or plant parts or plant organs and which, by virtue of their particular properties, promote plant growth and plant health. Examples are: *Agrobacterium spp.*, *Azorhizobium caulinodans*, *Azospirillum spp.*, *Azotobacter spp.*, *Bradyrhizobium spp.*, *Burkholderia spp.*, in particular *Burkholderia cepacia* (formerly known as *Pseudomonas cepacia*), *Gigaspora spp.*, or *Gigaspora monosporum*, *Glomus spp.*, *Laccaria spp.*, *Lactobacillus buchneri*, *Paraglomus spp.*, *Pisolithus tinctorius*, *Pseudomonas spp.*, *Rhizobium spp.*, in particular *Rhizobium trifolii*, *Rhizopogon spp.*, *Scleroderma spp.*, *Suillus spp.*, and *Streptomyces spp.*; and

(G) plant extracts and products formed by microorganisms including proteins and secondary metabolites which can be used as biological control agents, such as *Allium sativum*, *Artemisia absinthium*, azadirachtin, Biokeeper WP, *Cassia nigricans*, *Celastrus angulatus*, *Chenopodium anthelminticum*, chitin, Armour-Zen, *Dryopteris filix-mas*, *Equisetum arvense*, Fortune Aza, Fungastop, Heads Up (*Chenopodium quinoa* saponin extract), *Pyrethrum/Pyrethrins*, *Quassia amara*, *Quercus*, *Quillaja*, Regalia, "Requiem™ Insecticide", rotenone, *ryania/ryanodine*, *Symphytum officinale*, *Tanacetum vulgare*, thymol, Triact 70, TriCon, *Tropaeolum majus*, *Urtica dioica*, Veratrin, *Viscum album*, *Brassicaceae* extract, in particular oilseed rape powder or mustard powder, as well as bioinsecticidal / acaricidal active substances obtained from olive oil, in particular unsaturated fatty/carboxylic acids having carbon chain lengths C₁₆-C₂₀ as active ingredients, such as, for example, contained in the product with the trade name FLIPPER®.

The compound and the composition of the invention may be combined with one or more active ingredients selected from insecticides, acaricides and nematicides.

"Insecticides" as well as the term "insecticidal" refers to the ability of a substance to increase mortality or inhibit growth rate of insects. As used herein, the term "insects" comprises all organisms in the class "Insecta".

"Nematicide" and "nematicidal" refers to the ability of a substance to increase mortality or inhibit the growth rate of nematodes. In general, the term "nematode" comprises eggs, larvae, juvenile and mature forms of said organism.

“Acaricide” and “acaricidal” refers to the ability of a substance to increase mortality or inhibit growth rate of ectoparasites belonging to the class Arachnida, sub-class Acari.

Examples of insecticides, acaricides and nematicides, respectively, which could be mixed with the compound and the composition of the invention are:

- 5 (1) Acetylcholinesterase (AChE) inhibitors, preferably carbamates selected from alanycarb, aldicarb, bendiocarb, benfuracarb, butocarboxim, butoxycarboxim, carbaryl, carbofuran, carbosulfan, ethiofencarb, fenobucarb, formetanate, furathiocarb, isoprocarb, methiocarb, methomyl, metolcarb, oxamyl, pirimicarb, propoxur, thiodicarb, thiofanox, triazamate, trimethacarb, XMC and xylylcarb, or organophosphates selected from acephate, azamethiphos, azinphos-ethyl, azinphos-methyl, cadusafos, chlorethoxyfos, chlorfenvinphos, chlormephos, chlorpyrifos-methyl, coumaphos, cyanophos, demeton-S-methyl, 10 diazinon, dichlorvos/DDVP, dicrotophos, dimethoate, dimethylvinphos, disulfoton, EPN, ethion, ethoprophos, famphur, fenamiphos, fenitrothion, fenthion, fosthiazate, heptenophos, imicyafos, isofenphos, isopropyl O-(methoxyaminothiophosphoryl) salicylate, isoxathion, malathion, mecarbam, methamidophos, methidathion, mevinphos, monocrotophos, naled, omethoate, oxydemeton-methyl, 15 parathion-methyl, phenthoate, phorate, phosalone, phosmet, phosphamidon, phoxim, pirimiphos-methyl, profenofos, propetamphos, prothiofos, pyraclofos, pyridaphenthion, quinalphos, sulfotep, tebupirimfos, temephos, terbufos, tetrachlorvinphos, thiometon, triazophos, triclofon and vamidothion.
- (2) GABA-gated chloride channel blockers, preferably cyclodiene-organochlorines selected from chlordane and endosulfan, or phenylpyrazoles (fiproles) selected from ethiprole and fipronil.
- 20 (3) Sodium channel modulators, preferably pyrethroids selected from acrinathrin, allethrin, d-cis-trans allethrin, d-trans allethrin, bifenthrin, bioallethrin, bioallethrin s-cyclopentenyl isomer, bioresmethrin, cycloprothrin, cyfluthrin, beta-cyfluthrin, cyhalothrin, lambda-cyhalothrin, gamma-cyhalothrin, cypermethrin, alpha-cypermethrin, beta-cypermethrin, theta-cypermethrin, zeta-cypermethrin, cyphenothrin [(1R)-trans-isomer], deltamethrin, empenethrin [(EZ)-(1R)-isomer], esfenvalerate, 25 etofenprox, fenpropathrin, fenvalerate, flucythrinate, flumethrin, tau-fluvalinate, halfenprox, imiprothrin, kadethrin, momfluorothrin, permethrin, phenothrin [(1R)-trans-isomer], prallethrin, pyrethrins (pyrethrum), resmethrin, silafluofen, tefluthrin, tetramethrin, tetramethrin [(1R)- isomer)], tralomethrin and transfluthrin, or DDT or methoxychlor.
- (4) Nicotinic acetylcholine receptor (nAChR) competitive modulators, preferably neonicotinoids selected 30 from acetamiprid, clothianidin, dinotefuran, imidacloprid, nitenpyram, thiacloprid and thiamethoxam, or nicotine, or sulfoximines selected from sulfoxaflor, or butenolids selected from flupyradifurone, or mesoionics selected from triflumezopyrim.

- (5) Nicotinic acetylcholine receptor (nAChR) allosteric modulators (Site I), preferably spinosyns selected from spinetoram and spinosad.
- (6) Glutamate-gated chloride channel (GluCl) allosteric modulators, preferably avermectins/milbemycins selected from abamectin, emamectin benzoate, lepimectin and milbemectin.
- 5 (7) Juvenile hormone mimics, preferably juvenile hormone analogues selected from hydroprene, kinoprene and methoprene, or fenoxycarb or pyriproxyfen.
- (8) Miscellaneous non-specific (multi-site) inhibitors, preferably alkyl halides selected from methyl bromide and other alkyl halides, or chloropicrine or sulphuryl fluoride or borax or tartar emetic or methyl isocyanate generators selected from diazomet and metam.
- 10 (9) Chordotonal organ TRPV channel modulators, preferably pyridine azomethanes selected from pymetrozine and pyrifluquinazone, or pyropenes selected from afidopyropen.
- (10) Mite growth inhibitors affecting CHS1 selected from clofentezine, hexythiazox, diflovidazin and etoxazole.
- (11) Microbial disruptors of the insect gut membranes selected from *Bacillus thuringiensis* subspecies
15 *israelensis*, *Bacillus sphaericus*, *Bacillus thuringiensis* subspecies *aizawai*, *Bacillus thuringiensis* subspecies *kurstaki*, *Bacillus thuringiensis* subspecies *tenebrionis*, and *B.t.* plant proteins selected from Cry1Ab, Cry1Ac, Cry1Fa, Cry1A.105, Cry2Ab, Vip3A, mCry3A, Cry3Ab, Cry3Bb and Cry34Ab1/35Ab1.
- (12) Inhibitors of mitochondrial ATP synthase, preferably ATP disruptors selected from diafenthiuron, or
20 organotin compounds selected from azocyclotin, cyhexatin and fenbutatin oxide, or propargite or tetradifon.
- (13) Uncouplers of oxidative phosphorylation via disruption of the proton gradient selected from chlorfenapyr, DNOC and sulfluramid.
- (14) Nicotinic acetylcholine receptor channel blockers selected from bensultap, cartap hydrochloride,
25 thiocylam and thiosultap-sodium.
- (15) Inhibitors of chitin biosynthesis affecting CHS1, preferably benzoylureas selected from bistrifluron, chlorfluzuron, diflubenzuron, flucycloxon, flufenoxuron, hexaflumuron, lufenuron, novaluron, noviflumuron, teflubenzuron and triflumuron.
- (16) Inhibitors of chitin biosynthesis, type 1 selected from buprofezin.
- 30 (17) Moulting disruptor (in particular for Diptera, i.e. dipterans) selected from cyromazine.

- (18) Ecdysone receptor agonists, preferably diacylhydrazines selected from chromafenozide, halofenozide, methoxyfenozide and tebufenozide.
- (19) Octopamine receptor agonists selected from amitraz.
- (20) Mitochondrial complex III electron transport inhibitors selected from hydramethylnone, acequinocyl,
5 fluacrypyrim and bifenazate.
- (21) Mitochondrial complex I electron transport inhibitors, preferably METI acaricides and insecticides selected from fenazaquin, fenpyroximate, pyrimidifen, pyridaben, tebufenpyrad and tolfenpyrad, or rotenone (Derris).
- (22) Voltage-dependent sodium channel blockers, preferably oxadiazines selected from indoxacarb, or
10 semicarbazones selected from metaflumizone.
- (23) Inhibitors of acetyl CoA carboxylase, preferably tetrone and tetramic acid derivatives selected from spirodiclofen, spiromesifen, spiropidion and spirotetramat.
- (24) Mitochondrial complex IV electron transport inhibitors, preferably phosphides selected from
15 aluminium phosphide, calcium phosphide, phosphine and zinc phosphide, or cyanides selected from calcium cyanide, potassium cyanide and sodium cyanide.
- (25) Mitochondrial complex II electron transport inhibitors, preferably *beta*-ketonitrile derivatives selected from cyenopyrafen and cyflumetofen, or carboxanilides selected from pyflubumide.
- (28) Ryanodine receptor modulators, preferably diamides selected from chlorantraniliprole, cyantraniliprole, cyclaniliprole, flubendiamide and tetraniliprole.
- 20 (29) Chordotonal organ Modulators (with undefined target site) selected from flonicamid.
- (30) GABA-gated chlorid channel allosteric modulators, preferably *meta*-diamides selected from broflanilide, or isoxazoles selected from fluxametamide.
- (31) Baculoviruses, preferably Granuloviruses (GVs) selected from *Cydia pomonella* GV and *Thaumatotibia leucotreta* (GV), or Nucleopolyhedroviruses (NPVs) selected from *Anticarsia gemmatalis*
25 MNPV, Flucypriprole and *Helicoverpa armigera* NPV.
- (32) Nicotinic acetylcholine receptor allosteric modulators (Site II) selected from GS-omega/kappa HXTX-Hv1a peptide.
- (33) further active compounds selected from Acynonapyr, Afoxolaner, Azadirachtin, Benclonthiaz, Benzoximate, Benzpyrimoxan, Bromopropylate, Chinomethionat, Chloroprallethrin, Cryolite,

Cyclobutrifluram, Cycloxaprid, Cyetpyrafen, Cyhalodiamide, Cyproflanilide (CAS 2375110-88-4), Dicloromezotiaz, Dicolfol, Dimpropyridaz, epsilon-Metofluthrin, epsilon-Momfluthrin, Flometoquin, Fluazaindolizine, Flucypriprole (CAS 1771741-86-6), Fluensulfone, Flufenerim, Flufenoxystrobin, Flufiprole, Fluhexafon, Fluopyram, Flupyrimin, Fluralaner, Fufenozide, Flupentiofenox, Guadipyr, Heptafluthrin, Imidaclathiz, Iprodione, Isocycloseram, kappa-Bifenthrin, kappa-Tefluthrin, Lotilaner, Meperfluthrin, Nicofluprole (CAS 1771741-86-6), Oxazosulfyl, Paichongding, Pyridalyl, Pyrifluquinazon, Pyriminostrobin, Sarolaner, Spidoxamat, Spirobudiclofen, Tetramethylfluthrin, Tetrachlorantraniliprole, Tigolaner, Tioxazafen, Thiofluoximate, Tyclopyrazoflor, Iodomethane; furthermore preparations based on *Bacillus firmus* (I-1582, Votivo) and azadirachtin (BioNeem), and also the following compounds: 1-{2-fluoro-4-methyl-5-[(2,2,2-trifluoroethyl)sulphinyl]phenyl}-3-(trifluoromethyl)-1H-1,2,4-triazole-5-amine (known from WO2006/043635) (CAS 885026-50-6), 2-chloro-N-[2-{1-[(2E)-3-(4-chlorophenyl)prop-2-en-1-yl]piperidin-4-yl}-4-(trifluoromethyl)phenyl]isonicotinamide (known from WO2006/003494) (CAS 872999-66-1), 3-(4-chloro-2,6-dimethylphenyl)-4-hydroxy-8-methoxy-1,8-diazaspiro[4.5]dec-3-en-2-one (known from WO 2010052161) (CAS 1225292-17-0), 3-(4-chloro-2,6-dimethylphenyl)-8-methoxy-2-oxo-1,8-diazaspiro[4.5]dec-3-en-4-yl ethyl carbonate (known from EP2647626) (CAS 1440516-42-6), PF1364 (known from JP2010/018586) (CAS 1204776-60-2), (3E)-3-[1-[(6-chloro-3-pyridyl)methyl]-2-pyridylidene]-1,1,1-trifluoro-propan-2-one (known from WO2013/144213) (CAS 1461743-15-6), N-[3-(benzylcarbamoyl)-4-chlorophenyl]-1-methyl-3-(pentafluoroethyl)-4-(trifluoromethyl)-1H-pyrazole-5-carboxamide (known from WO2010/051926) (CAS 1226889-14-0), 5-bromo-4-chloro-N-[4-chloro-2-methyl-6-(methylcarbamoyl)phenyl]-2-(3-chloro-2-pyridyl)pyrazole-3-carboxamide (known from CN103232431) (CAS 1449220-44-3), 4-[5-(3,5-dichlorophenyl)-4,5-dihydro-5-(trifluoromethyl)-3-isoxazolyl]-2-methyl-N-(cis-1-oxido-3-thietanyl)-benzamide, 4-[5-(3,5-dichlorophenyl)-4,5-dihydro-5-(trifluoromethyl)-3-isoxazolyl]-2-methyl-N-(trans-1-oxido-3-thietanyl)-benzamide and 4-[(5S)-5-(3,5-dichlorophenyl)-4,5-dihydro-5-(trifluoromethyl)-3-isoxazolyl]-2-methyl-N-(cis-1-oxido-3-thietanyl)benzamide (known from WO 2013/050317 A1) (CAS 1332628-83-7), N-[3-chloro-1-(3-pyridinyl)-1H-pyrazol-4-yl]-N-ethyl-3-[(3,3,3-trifluoropropyl)sulfinyl]-propanamide, (+)-N-[3-chloro-1-(3-pyridinyl)-1H-pyrazol-4-yl]-N-ethyl-3-[(3,3,3-trifluoropropyl)sulfinyl]-propanamide and (-)-N-[3-chloro-1-(3-pyridinyl)-1H-pyrazol-4-yl]-N-ethyl-3-[(3,3,3-trifluoropropyl)sulfinyl]-propanamide (known from WO 2013/162715 A2, WO 2013/162716 A2, US 2014/0213448 A1) (CAS 1477923-37-7), 5-[[2E)-3-chloro-2-propen-1-yl]amino]-1-[2,6-dichloro-4-(trifluoromethyl)phenyl]-4-[(trifluoromethyl)sulfinyl]-1H-pyrazole-3-carbonitrile (known from CN 101337937 A) (CAS 1105672-77-2), 3-bromo-N-[4-chloro-2-methyl-6-[(methylamino)thioxomethyl]phenyl]-1-(3-chloro-2-pyridinyl)-1H-pyrazole-5-carboxamide, (Liudaibenjiaxuanan, known from CN 103109816 A) (CAS 1232543-85-9); N-[4-chloro-2-[(1,1-dimethylethyl)amino]carbonyl]-6-methylphenyl]-1-(3-chloro-2-pyridinyl)-3-(fluoromethoxy)-1H-pyrazole-5-carboxamide (known from WO 2012/034403 A1) (CAS 1268277-22-0), N-[2-(5-amino-1,3,4-thiadiazol-2-yl)-4-chloro-6-methylphenyl]-3-bromo-1-(3-chloro-2-pyridinyl)-1H-pyrazole-5-carbox-

amide (known from WO 2011/085575 A1) (CAS 1233882-22-8), 4-[3-[2,6-dichloro-4-[(3,3-dichloro-2-propen-1-yl)oxy]phenoxy]propoxy]-2-methoxy-6-(trifluoromethyl)-pyrimidine (known from CN 101337940 A) (CAS 1108184-52-6); (2E)- and 2(Z)-2-[2-(4-cyanophenyl)-1-[3-(trifluoromethyl)phenyl]ethylidene]-N-[4-(difluoromethoxy)phenyl]-hydrazinecarboxamide (known from CN 101715774 A) (CAS 1232543-85-9); 3-(2,2-dichloroethenyl)-2,2-dimethyl-4-(1H-benzimidazol-2-yl)phenyl-cyclopropanecarboxylic acid ester (known from CN 103524422 A) (CAS 1542271-46-4); (4aS)-7-chloro-2,5-dihydro-2-[(methoxycarbonyl)[4-(trifluoromethyl)thio]phenyl]amino]carbonyl]-indeno[1,2-e][1,3,4]oxadiazine-4a(3H)-carboxylic acid methyl ester (known from CN 102391261 A) (CAS 1370358-69-2); 6-deoxy-3-O-ethyl-2,4-di-O-methyl-, 1-[N-[4-[1-[4-(1,1,2,2,2-pentafluoroethoxy)phenyl]-1H-1,2,4-triazol-3-yl]phenyl]carbamate]- α -L-mannopyranose (known from US 2014/0275503 A1) (CAS 1181213-14-8); 8-(2-cyclopropylmethoxy-4-trifluoromethyl-phenoxy)-3-(6-trifluoromethyl-pyridazin-3-yl)-3-aza-bicyclo[3.2.1]octane (CAS 1253850-56-4), (8-anti)-8-(2-cyclopropylmethoxy-4-trifluoromethyl-phenoxy)-3-(6-trifluoromethyl-pyridazin-3-yl)-3-aza-bicyclo[3.2.1]octane (CAS 933798-27-7), (8-syn)-8-(2-cyclopropylmethoxy-4-trifluoromethyl-phenoxy)-3-(6-trifluoromethyl-pyridazin-3-yl)-3-aza-bicyclo[3.2.1]octane (known from WO 2007040280 A1, WO 2007040282 A1) (CAS 934001-66-8), N-[4-(aminothioxomethyl)-2-methyl-6-[(methylamino)carbonyl]phenyl]-3-bromo-1-(3-chloro-2-pyridinyl)-1H-pyrazole-5-carboxamide (known from CN 103265527 A) (CAS 1452877-50-7), 3-(4-chloro-2,6-dimethylphenyl)-8-methoxy-1-methyl-1,8-diazaspiro[4.5]decane-2,4-dione (known from WO 2014/187846 A1) (CAS 1638765-58-8), 3-(4-chloro-2,6-dimethylphenyl)-8-methoxy-1-methyl-2-oxo-1,8-diazaspiro[4.5]dec-3-en-4-yl-carbonic acid ethyl ester (known from WO 2010/066780 A1, WO 2011151146 A1) (CAS 1229023-00-0), N-[1-(2,6-difluorophenyl)-1H-pyrazol-3-yl]-2-(trifluoromethyl)benzamide (known from WO 2014/053450 A1) (CAS 1594624-87-9), N-[2-(2,6-difluorophenyl)-2H-1,2,3-triazol-4-yl]-2-(trifluoromethyl)benzamide (known from WO 2014/053450 A1) (CAS 1594637-65-6), N-[1-(3,5-difluoro-2-pyridinyl)-1H-pyrazol-3-yl]-2-(trifluoromethyl)benzamide (known from WO 2014/053450 A1) (CAS 1594626-19-3), (3R)-3-(2-chloro-5-thiazolyl)-2,3-dihydro-8-methyl-5,7-dioxo-6-phenyl-5H-thiazolo[3,2-a]pyrimidinium inner salt (known from WO 2018/177970 A1) (CAS 2246757-58-2); 3-(2-chloro-5-thiazolyl)-2,3-dihydro-8-methyl-5,7-dioxo-6-phenyl-5H-thiazolo[3,2-a]pyrimidinium inner salt (known from WO 2018/177970 A1) (CAS 2246757-56-0); N-[3-chloro-1-(3-pyridinyl)-1H-pyrazol-4-yl]-2-(methylsulfonyl)propanamide (known from WO 2019/236274 A1) (CAS 2396747-83-2), N-[2-bromo-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]-6-(trifluoromethyl)phenyl]-2-fluoro-3-[(4-fluorobenzoyl)amino]benzamide (known from WO 2019059412 A1) (CAS 1207977-87-4), 3-Bromo-1-(3-chloro-2-pyridinyl)-N-[4,6-dichloro-3-fluoro-2-[(methylamino)carbonyl]phenyl]-1H-Pyrazole-5-carboxamide (Fluchlorodiamide; known from CN110835330 A, CN106977494 A) (CAS: 2129147-03-9).

35 Examples of nematicides which could be mixed with the compound and the composition of the invention are:

(Group N-1) Acetylcholinesterase (AChE) inhibitors, preferably (N-1A) carbamates selected from aldicarb, benfuracarb, carbofuran, carbosulfan and thiodicarb, or (N-1B) organophosphates selected from cadusafos, ethoprofos, fenamiphos, fosthiazate, imicyafos, phorate and terbufos.

5 (Group N-2) Glutamate-gated chloride channel (GluCl) allosteric modulators, preferably avermectins selected from abamectin and emamectin benzoate.

(Group N-3) Mitochondrial complex II electron transport inhibitors, especially inhibitors of succinate-coenzyme Q reductase, preferably pyridinylmethyl-benzamides selected from fluopyram.

(Group N-4) Lipid synthesis/growth regulation modulators, especially inhibitors of acetyl CoA carboxylase, preferably tetronic and tetramic acid derivatives selected from spirotetramat.

10 (Group N-UN) Compounds of unknown or uncertain mode of action with various chemistries, selected from fluensulfone, fluzaindolizine, furfural, iprodione and tioxazafen.

(Group N-UNX) Compounds of unknown or uncertain mode of action: Presumed multi-site inhibitors, preferably volatile sulphur generators selected from carbon disulphide and dimethyl disulphide (DMDS), or carbon disulphide liberators selected from sodium tetrathiocarbonate, or alkyl halides selected from 15 methyl bromide and methyl iodide (iodomethane), or halogenated hydrocarbons selected from 1,2-dibromo-3-chloropropane (DBCP) and 1,3-dichloropropene, or chloropicrin, or methyl isothiocyanate generators selected from allyl isothiocyanate, diazomet, metam potassium and metam sodium.

(Group N-UNB) Bacterial agents (non-*Bt*) of unknown or uncertain mode of action, preferably bacterium or bacterium-derived, selected from *Burkholderia* spp., e.g. *rinojensis* A396, *Bacillus* spp., e.g. *firmus*, 20 *licheniformis*, *amyloliquefaciens* or *subtilis*, *Pasteuria* spp., e.g. *penetrans* or *nishizawae*, *Pseudomonas* spp., e.g. *chlororaphis* or *fluorescens*, and *Streptomyces* spp., e.g. *lydicus*, *dicklowii* or *albogriseolus*.

(Group N-UNF) Fungal agents of unknown or uncertain mode of action, preferably fungus or fungus-derived, selected from *Actinomyces* spp., e.g. *streptococcus*, *Arthrobotrys* spp., e.g. *oligospora*, *Aspergillus* spp., e.g. *niger*, *Muscodor* spp., e.g. *albus*, *Myrothecium* spp., e.g. *verrucaria*, *Paecilomyces* 25 spp., e.g. *lilacinus* (*Purpureocillium lilacinum*), *carneus* or *fumosoroseus*, *Pochonia* spp., e.g. *chlamydosporia*, and *Trichoderma* spp., e.g. *harzianum*, *virens*, *atroviride* or *viride*.

(Group N-UNE) Botanical or animal derived agents, including synthetic extracts and unrefined oils, with unknown or uncertain mode of action, preferably botanical or animal derived agents selected from azadirachtin, camellia seed cake, essential oils, garlic extract, pongamia oil, terpenes, e.g. carvacrol, and 30 *Quillaja saponaria* extract.

Examples of herbicides which could be mixed with the compound and the composition of the invention are:

acetochlor, acifluorfen, acifluorfen-methyl, acifluorfen-sodium, aclonifen, alachlor, allidochlor, alloxydim, alloxydim-sodium, ametryn, amicarbazone, amidochlor, amidosulfuron, 4-amino-3-chloro-6-
5 (4-chloro-2-fluoro-3-methylphenyl)-5-fluoropyridine-2-carboxylic acid, aminocyclopyrachlor, aminocyclopyrachlor-potassium, aminocyclopyrachlor-methyl, aminopyralid, aminopyralid-dimethylammonium, aminopyralid-tripromine, amitrole, ammoniumsulfamate, anilofos, asulam, asulam-potassium, asulam sodium, atrazine, azafenidin, azimsulfuron, beflubutamid, (S)-(-)-beflubutamid, beflubutamid-M, benazolin, benazolin-ethyl, benazolin-dimethylammonium, benazolin-potassium,
10 benfluralin, benfuresate, bensulfuron, bensulfuron-methyl, bensulide, bentazone, bentazone-sodium, benzobicyclon, benzofenap, bicyclopyrone, bifenox, bilanafos, bilanafos-sodium, bipyrazone, bispyribac, bispyribac-sodium, bixlozone, bromacil, bromacil-lithium, bromacil-sodium, bromobutide, bromofenoxim, bromoxynil, bromoxynil-butyrate, -potassium, -heptanoate und -octanoate, busoxinone, butachlor, butafenacil, butamifos, butenachlor, butralin, butroxydim, butylate, cafenstrole,
15 cambendichlor, carbetamide, carfentrazone, carfentrazone-ethyl, chloramben, chloramben-ammonium, chloramben-diolamine, chlroamben-methyl, chloramben-methylammonium, chloramben-sodium, chlorbromuron, chlorfenac, chlorfenac-ammonium, chlorfenac-sodium, chlorfenprop, chlorfenprop-methyl, chlorflurenol, chlorflurenol-methyl, chloridazon, chlorimuron, chlorimuron-ethyl, chlorophthalim, chlorotoluron, chlorsulfuron, chlorthal, chlorthal-dimethyl, chlorthal-monomethyl,
20 cinidon, cinidon-ethyl, cinmethylin, exo-(+)-cinmethylin, i.e. (1R,2S,4S)-4-isopropyl-1-methyl-2-[(2-methylbenzyl)oxy]-7-oxabicyclo[2.2.1]heptane, exo-(-)-cinmethylin, i.e. (1R,2S,4S)-4-isopropyl-1-methyl-2-[(2-methylbenzyl)oxy]-7-oxabicyclo[2.2.1]heptane, cinosulfuron, clacyfos, clethodim, clodinafop, clodinafop-ethyl, clodinafop-propargyl, clomazone, clomeprop, clopyralid, clopyralid-methyl, clopyralid-olamine, clopyralid-potassium, clopyralid-tripomine, cloransulam, cloransulam-
25 methyl, cumyluron, cyanamide, cyanazine, cycloate, cyclopyranil, cyclopyrimorate, cyclosulfamuron, cycloxydim, cyhalofop, cyhalofop-butyl, cyprazine, 2,4-D (including thea mmonium, butotyl, -butyl, choline, diethylammonium, -dimethylammonium, -diolamine, -doboxy, -dodecylammonium, etexyl, ethyl, 2-ethylhexyl, heptylammonium, isobutyl, isoocetyl, isopropyl, isopropylammonium, lithium, meptyl, methyl, potassium, tetradecylammonium, triethylammonium, triisopropanolammonium,
30 tripromine and trolamine salt thereof), 2,4-DB, 2,4-DB-butyl, -dimethylammonium, isoocetyl, -potassium und -sodium, daimuron (dymron), dalapon, dalapon-calcium, dalapon-magnesium, dalapon-sodium, dazomet, dazomet-sodium, n-decanol, 7-deoxy-D-sedoheptulose, desmedipham, detosyl-pyrazolate (DTP), dicamba and its salts, e. g. dicamba-biproamine, dicamba-N,N-Bis(3-aminopropyl)methylamine, dicamba-butotyl, dicamba-choline, dicamba-diglycolamine, dicamba-dimethylammonium, dicamba-
35 diethanolamine ammonium, dicamba-diethylammonium, dicamba-isopropylammonium, dicamba-methyl, dicamba-monoethanolamine, dicamba-olamine, dicamba-potassium, dicamba-sodium, dicamba-triethanolamine, dichlobenil, 2-(2,4-dichlorobenzyl)-4,4-dimethyl-1,2-oxazolidin-3-one, 2-(2,5-

dichlorobenzyl)-4,4-dimethyl-1,2-oxazolidin-3-one, dichlorprop, dichlorprop-butotyl, dichlorprop-dimethylammonium, dichlorprop-etexyl, dichlorprop-ethylammonium, dichlorprop-isooctyl, dichlorprop-methyl, dichlorprop-potassium, dichlorprop-sodium, dichlorprop-P, dichlorprop-P-dimethylammonium, dichlorprop-P-etexyl, dichlorprop-P-potassium, dichlorprop-sodium, diclofop, 5 diclofop-methyl, diclofop-P, diclofop-P-methyl, diclosulam, difenzoquat, difenzoquat-metilsulfate, diflufenican, diflufenzopyr, diflufenzopyr-sodium, dimefuron, dimepiperate, dimesulfazet, dimethachlor, dimethametryn, dimethenamid, dimethenamid-P, dimetrasulfuron, dinitramine, dinoterb, dinoterb-acetate, diphenamid, diquat, diquat-dibromid, diquat-dichloride, dithiopyr, diuron, DNOC, DNOC-ammonium, DNOC-potassium, DNOC-sodium, endothal, endothal-diammonium, endothal-dipotassium, 10 endothal-disodium, Epyrifenacil (S-3100), EPTC, esprocarb, ethalfluralin, ethametsulfuron, ethametsulfuron-methyl, ethiozin, ethofumesate, ethoxyfen, ethoxyfen-ethyl, ethoxysulfuron, etobenzanid, F-5231, i.e. N-[2-Chlor-4-fluor-5-[4-(3-fluorpropyl)-4,5-dihydro-5-oxo-1H-tetrazol-1-yl]-phenyl]-ethansulfonamid, F-7967, i.e. 3-[7-Chlor-5-fluor-2-(trifluormethyl)-1H-benzimidazol-4-yl]-1-methyl-6-(trifluoromethyl)pyrimidin-2,4(1H,3H)-dione, fenoxaprop, fenoxaprop-P, fenoxaprop-ethyl, fenoxaprop-P-ethyl, fenoxasulfone, fenpyrazone, fenquinotrione, fentrazamide, flamprop, flamprop-isoproyl, 15 flamprop-methyl, flamprop-M-isopropyl, flamprop-M-methyl, flazasulfuron, florasulam, florpyrauxifen, florpyrauxifen-benzyl, fluazifop, fluazifop-butyl, fluazifop-methyl, fluazifop-P, fluazifop-P-butyl, flucarbazone, flucarbazone-sodium, flucetosulfuron, fluchloralin, flufenacet, flufenpyr, flufenpyr-ethyl, flumetsulam, flumiclorac, flumiclorac-pentyl, flumioxazin, fluometuron, flurenol, flurenol-butyl, - 20 dimethylammonium und -methyl, fluoroglycofen, fluoroglycofen-ethyl, flupropanate, flupropanate-sodium, flupyrsulfuron, flupyrsulfuron-methyl, flupyrsulfuron-methyl-sodium, fluridone, flurochloridone, fluroxypyr, fluroxypyr-butometyl, fluroxypyr-meptyl, flurtamone, fluthiacet, fluthiacet-methyl, fomesafen, fomesafen-sodium, foramsulfuron, foramsulfuron sodium salt, fosamine, fosamine-ammonium, glufosinate, glufosinate-ammonium, glufosinate-sodium, L-glufosinate-ammonium, L- 25 glufosinate-sodium, glufosinate-P-sodium, glufosinate-P-ammonium, glyphosate, glyphosate-ammonium, -isopropylammonium, -diammonium, -dimethylammonium, -potassium, -sodium, sesquisodium and -trimesium, H-9201, i.e. O-(2,4-Dimethyl-6-nitrophenyl)-O-ethyl-isopropylphosphoramidothioat, halauxifen, halauxifen-methyl, halosafen, halosulfuron, halosulfuron-methyl, haloxyfop, haloxyfop-P, haloxyfop-ethoxyethyl, haloxyfop-P-ethoxyethyl, haloxyfop-methyl, 30 haloxyfop-P-methyl, haloxyfop-sodium, hexazinone, HNPC-A8169, i.e. prop-2-yn-1-yl (2S)-2-{3-[(5-tert-butylpyridin-2-yl)oxy]phenoxy}propanoate, HW-02, i.e. 1-(Dimethoxyphosphoryl)-ethyl-(2,4-dichlorphenoxy)acetat, hydantocidin, imazamethabenz, imazamethabenz-methyl, imazamox, imazamox-ammonium, imazapic, imazapic-ammonium, imazapyr, imazapyr-isopropylammonium, imazaquin, imazaquin-ammonium, imazaquin-methyl, imazethapyr, imazethapyr-immonium, imazosulfuron, 35 indanofan, indaziflam, iodosulfuron, iodosulfuron-methyl, iodosulfuron-methyl-sodium, ioxynil, ioxynil-lithium, -octanoate, -potassium und sodium, ipfencarbazone, isoproturon, isouron, isoxaben, isoxaflutole, karbutilate, KUH-043, i.e. 3-([5-(Difluormethyl)-1-methyl-3-(trifluormethyl)-1H-pyrazol-4-

yl)methyl)sulfonyl)-5,5-dimethyl-4,5-dihydro-1,2-oxazol, ketospiradox, ketospiradox-potassium, lactofen, lancotrione, lenacil, linuron, MCPA, MCPA-butotyl, -butyl, -dimethylammonium, -diolamine, -2-ethylhexyl, -ethyl, -isobutyl, isoctyl, -isopropyl, -isopropylammonium, -methyl, olamine, -potassium, -sodium and -trolamine, MCPB, MCPB-methyl, -ethyl und -sodium, mecoprop, mecoprop-butotyl, 5 mecoprop- demethylammonium, mecoprop-diolamine, mecoprop-etexyl, mecoprop-ethadyl, mecoprop-isoctyl, mecoprop-methyl, mecoprop-potassium, mecoprop-sodium, and mecoprop-trolamine, mecoprop-P, mecoprop-P-butotyl, -dimethylammonium, -2-ethylhexyl and -potassium, mefenacet, mefluidide, mefluidide-diolamine, mefluidide-potassium, mesosulfuron, mesosulfuron-methyl, mesosulfuron sodium salt, mesotrione, methabenzthiazuron, metam, metamifop, metamidron, metazachlor, metazosulfuron, 10 methabenzthiazuron, methiopyrsulfuron, methiozolin, methyl isothiocyanate, metobromuron, metolachlor, S-metolachlor, metosulam, metoxuron, metribuzin, metsulfuron, metsulfuron-methyl, molinate, monolinuron, monosulfuron, monosulfuron-methyl, MT-5950, i.e. N-[3-chlor-4-(1-methylethyl)-phenyl]-2-methylpentanamid, NGGC-011, napropamide, NC-310, i.e. 4-(2,4-Dichlorbenzoyl)-1-methyl-5-benzyloxy-pyrazol, NC-656, i.e. 3-[(isopropylsulfonyl)methyl]-N-(5-methyl-15 1,3,4-oxadiazol-2-yl)-5-(trifluoromethyl)[1,2,4]triazolo[4,3-a]pyridine-8-carboxamide, neburon, nicosulfuron, nonanoic acid (pelargonic acid), norflurazon, oleic acid (fatty acids), orbencarb, orthosulfamuron, oryzalin, oxadiargyl, oxadiazon, oxasulfuron, oxaziclomefone, oxyfluorfen, paraquat, paraquat-dichloride, paraquat-dimethylsulfate, pebulate, pendimethalin, penoxsulam, pentachlorphenol, pentoxazone, pethoxamid, petroleum oils, phenmedipham, phenmedipham-ethyl, picloram, picloram-20 dimethylammonium, picloram-etexyl, picloram-isoctyl, picloram-methyl, picloram-olamine, picloram-potassium, picloram-triethylammonium, picloram-tripromine, picloram-trolamine, picolinafen, pinoxaden, piperophos, pretilachlor, primisulfuron, primisulfuron-methyl, prodiamine, profoxydim, prometon, prometryn, propachlor, propanil, propaquizafop, propazine, propham, propisochlor, propoxycarbazone, propoxycarbazone-sodium, propyrisulfuron, propyzamide, prosulfocarb, prosulfuron, 25 pyraclonil, pyraflufen, pyraflufen-ethyl, pyrasulfotole, pyrazolynate (pyrazolate), pyrazosulfuron, pyrazosulfuron-ethyl, pyrazoxyfen, pyribambenz, pyribambenz-isopropyl, pyribambenz-propyl, pyribenzoxim, pyributicarb, pyridafol, pyridate, pyriftalid, pyriminobac, pyriminobac-methyl, pyrimisulfan, pyrithiobac, pyrithiobac-sodium, pyroxasulfone, pyroxsulam, quinclorac, quinclorac-dimethylammonium, quinclorac-methyl, quinmerac, quinoamine, quizalofop, quizalofop-ethyl, 30 quizalofop-P, quizalofop-P-ethyl, quizalofop-P-tefuryl, QYM201, i.e. 1-{2-chloro-3-[(3-cyclopropyl-5-hydroxy-1-methyl-1H-pyrazol-4-yl)carbonyl]-6-(trifluoromethyl)phenyl}piperidin-2-one, rimsulfuron, saflufenacil, sethoxydim, siduron, simazine, simetryn, SL-261, sulcotrione, sulfentrazone, sulfometuron, sulfometuron-methyl, sulfosulfuron, SYP-249, i.e. 1-Ethoxy-3-methyl-1-oxobut-3-en-2-yl-5-[2-chlor-4-(trifluoromethyl)phenoxy]-2-nitrobenzoat, SYP-300, i.e. 1-[7-Fluor-3-oxo-4-(prop-2-in-1-yl)-3,4-35 dihydro-2H-1,4-benzoxazin-6-yl]-3-propyl-2-thioxoimidazolidin-4,5-dion, 2,3,6-TBA, TCA (trichloroacetic acid) and its salts, e.g. TCA-ammonium, TCA-calcium, TCA-ethyl, TCA-magnesium, TCA-sodium, tebuthiuron, tefuryltrione, tembotrione, tepraloxydim, terbacil, terbucarb, terbumeton,

terbuthylazine, terbutryn, tetflupyrolimet, thaxtomin, thenylchlor, thiazopyr, thiencarbazone, thiencarbazone-methyl, thifensulfuron, thifensulfuron-methyl, thiobencarb, tiafenacil, tolpyralate, topramezone, tralkoxydim, triafamone, tri-allate, triasulfuron, triaziflam, tribenuron, tribenuron-methyl, triclopyr, triclopyr-butotyl, triclopyr-choline, triclopyr-ethyl, triclopyr-triethylammonium, trietazine, trifloxysulfuron, trifloxysulfuron-sodium, trifludimoxazin, trifluralin, triflusulfuron, triflusulfuron-methyl, tritosulfuron, urea sulfate, vernolate, XDE-848, ZJ-0862, i.e. 3,4-Dichlor-N-{2-[(4,6-dimethoxypyrimidin-2-yl)oxy]benzyl}anilin, 3-(2-chloro-4-fluoro-5-(3-methyl-2,6-dioxo-4-trifluoromethyl-3,6-dihydropyrimidin-1 (2H)-yl)phenyl)-5-methyl-4,5-dihydroisoxazole-5-carboxylic acid ethyl ester, ethyl-[(3-{2-chlor-4-fluor-5-[3-methyl-2,6-dioxo-4-(trifluormethyl)-3,6-dihydropyrimidin-1(2H)-yl]phenoxy}pyridin-2-yl)oxy]acetate, 3-chloro-2-[3-(difluoromethyl)isoxazolyl-5-yl]phenyl-5-chloropyrimidin-2-yl ether, 2-(3,4-dimethoxyphenyl)-4-[(2-hydroxy-6-oxocyclohex-1-en-1-yl)carbonyl]-6-methylpyridazine-3(2H)-one, 2-({2-[(2-methoxyethoxy)methyl]-6-methylpyridin-3-yl}carbonyl)cyclohexane-1,3-dione, (5-hydroxy-1-methyl-1H-pyrazol-4-yl)(3,3,4-trimethyl-1,1-dioxido-2,3-dihydro-1-benzothiophen-5-yl)methanone, 1-methyl-4-[(3,3,4-trimethyl-1,1-dioxido-2,3-dihydro-1-benzothiophen-5-yl)carbonyl]-1H-pyrazol-5-yl propane-1-sulfonate, 4-{2-chloro-3-[(3,5-dimethyl-1H-pyrazol-1-yl)methyl]-4-(methylsulfonyl)benzoyl}-1-methyl-1H-pyrazol-5-yl-1,3-dimethyl-1H-pyrazole-4-carboxylate; cyanomethyl 4-amino-3-chloro-5-fluoro-6-(7-fluoro-1H-indol-6-yl)pyridine-2-carboxylate, prop-2-yn-1-yl 4-amino-3-chloro-5-fluoro-6-(7-fluoro-1H-indol-6-yl)pyridine-2-carboxylate, methyl 4-amino-3-chloro-5-fluoro-6-(7-fluoro-1H-indol-6-yl)pyridine-2-carboxylate, 4-amino-3-chloro-5-fluoro-6-(7-fluoro-1H-indol-6-yl)pyridine-2-carboxylic acid, benzyl 4-amino-3-chloro-5-fluoro-6-(7-fluoro-1H-indol-6-yl)pyridine-2-carboxylate, ethyl 4-amino-3-chloro-5-fluoro-6-(7-fluoro-1H-indol-6-yl)pyridine-2-carboxylate, methyl 4-amino-3-chloro-5-fluoro-6-(7-fluoro-1-isobutyryl-1H-indol-6-yl)pyridine-2-carboxylate, methyl 6-(1-acetyl-7-fluoro-1H-indol-6-yl)-4-amino-3-chloro-5-fluoropyridine-2-carboxylate, methyl 4-amino-3-chloro-6-[1-(2,2-dimethylpropanoyl)-7-fluoro-1H-indol-6-yl]-5-fluoropyridine-2-carboxylate, methyl 4-amino-3-chloro-5-fluoro-6-[7-fluoro-1-(methoxyacetyl)-1H-indol-6-yl]pyridine-2-carboxylate, potassium 4-amino-3-chloro-5-fluoro-6-(7-fluoro-1H-indol-6-yl)pyridine-2-carboxylate, sodium 4-amino-3-chloro-5-fluoro-6-(7-fluoro-1H-indol-6-yl)pyridine-2-carboxylate, butyl 4-amino-3-chloro-5-fluoro-6-(7-fluoro-1H-indol-6-yl)pyridine-2-carboxylate, 4-hydroxy-1-methyl-3-[4-(trifluoromethyl)pyridin-2-yl]imidazolidin-2-one, 3-(5-tert-butyl-1,2-oxazol-3-yl)-4-hydroxy-1-methylimidazolidin-2-one, 3-[5-chloro-4-(trifluoromethyl)pyridin-2-yl]-4-hydroxy-1-methylimidazolidin-2-one, 4-hydroxy-1-methoxy-5-methyl-3-[4-(trifluoromethyl)pyridin-2-yl]imidazolidin-2-one, 6-[(2-hydroxy-6-oxocyclohex-1-en-1-yl)carbonyl]-1,5-dimethyl-3-(2-methylphenyl)quinazolin-2,4(1H,3H)-dione, 3-(2,6-dimethylphenyl)-6-[(2-hydroxy-6-oxocyclohex-1-en-1-yl)carbonyl]-1-methylquinazolin-2,4(1H,3H)-dione, 2-[2-chloro-4-(methylsulfonyl)-3-(morpholin-4-ylmethyl)benzoyl]-3-hydroxycyclohex-2-en-1-one, 1-(2-carboxyethyl)-4-(pyrimidin-2-yl)pyridazin-1-ium salt (with anions such as chloride, acetate or trifluoroacetate), 1-(2-carboxyethyl)-4-(pyridazin-3-yl)pyridazin-1-ium salt (with anions such as chloride, acetate or trifluoroacetate), 4-(pyrimidin-2-yl)-1-(2-sulfoethyl)pyridazin-1-ium salt (with

anions such as chloride, acetate or trifluoroacetate), 4-(pyridazin-3-yl)-1-(2-sulfoethyl)pyridazin-1-ium salt (with anions such as chloride, acetate or trifluoroacetate), 1-(2-Carboxyethyl)-4-(1,3-thiazol-2-yl)pyridazin-1-ium salt (with anions such as chloride, acetate or trifluoroacetate), 1-(2-Carboxyethyl)-4-(1,3-thiazol-2-yl)pyridazin-1-ium salt (with anions such as chloride, acetate or trifluoroacetate).

- 5 Examples of plant growth regulators which could be mixed with the compound and the composition of the invention are:

Abscisic acid and related analogues [e.g. (2Z,4E)-5-[6-Ethynyl-1-hydroxy-2,6-dimethyl-4-oxocyclohex-2-en-1-yl]-3-methylpenta-2,4-dienoic acid, methyl-(2Z,4E)-5-[6-ethynyl-1-hydroxy-2,6-dimethyl-4-oxocyclohex-2-en-1-yl]-3-methylpenta-2,4-dienoate, (2Z,4E)-3-ethyl-5-(1-hydroxy-2,6,6-trimethyl-4-oxocyclohex-2-en-1-yl)penta-2,4-dienoic acid, (2E,4E)-5-(1-hydroxy-2,6,6-trimethyl-4-oxocyclohex-2-en-1-yl)-3-(trifluoromethyl)penta-2,4-dienoic acid, methyl (2E,4E)-5-(1-hydroxy-2,6,6-trimethyl-4-oxocyclohex-2-en-1-yl)-3-(trifluoromethyl)penta-2,4-dienoate, (2Z,4E)-5-(2-hydroxy-1,3-dimethyl-5-oxobicyclo[4.1.0]hept-3-en-2-yl)-3-methylpenta-2,4-dienoic acid], acibenzolar, acibenzolar-S-methyl, S-adenosylhomocysteine, allantoin, 2-Aminoethoxyvinylglycine (AVG), aminoxyacetic acid and related esters [e.g. (Isopropylidene)-aminoxyacetic acid-2-(methoxy)-2-oxoethylester, (Isopropylidene)-aminoxyacetic acid-2-(hexyloxy)-2-oxoethylester, (Cyclohexylidene)-aminoxyacetic acid-2-(isopropoxy)-2-oxoethylester], 1-aminocycloprop-1-yl carboxylic acid and derivatives thereof, e.g. disclosed in DE333514, EP30287, DE2906507 or US5123951, 5-aminolevulinic acid, ancymidol, 6-benzylaminopurine, bixin, brassinolide, brassinolide-ethyl, L-canaline, catechin and catechines (e.g. (2S,3R)-2-(3,4-Dihydroxyphenyl)-3,4-dihydro-2H-chromen-3,5,7-triol), chitoooligosaccharides (CO; COs differ from LCOs in that they lack the pendant fatty acid chain that is characteristic of LCOs. COs, sometimes referred to as N-acetylchitoooligosaccharides, are also composed of GlcNAc residues but have side chain decorations that make them different from chitin molecules [(C₈H₁₃NO₅)_n, CAS No. 1398-61-4] and chitosan molecules [(C₅H₁₁NO₄)_n, CAS No. 9012-76-4]), chitinous compounds, chlormequat chloride, cloprop, cyclanilide, 3-(Cycloprop-1-enyl)propionic acid, 1-[2-(4-cyano-3,5-dicyclopropylphenyl)acetamido]cyclohexanecarboxylic acid, 1-[2-(4-cyano-3-cyclopropylphenyl)acetamido]cyclohexanecarboxylic acid, daminozide, dazomet, dazomet-sodium, n-decanol, dikegulac, dikegulac-sodium, endothal, endothal-dipotassium, -disodium, and mono(N,N-dimethylalkylammonium), ethephon, flumetralin, flurenol, flurenol-butyl, flurenol-methyl, flurprimidol, forchlorfenuron, gibberellic acid, inabenfide, indol-3-acetic acid (IAA), 4-indol-3-ylbutyric acid, isoprothiolane, probenazole, jasmonic acid, Jasmonic acid or derivatives thereof (e.g. jasmonic acid methyl ester, jasmonic acid ethyl ester), lipochitoooligosaccharides (LCO, sometimes referred to as symbiotic nodulation (Nod) signals (or Nod factors) or as Myc factors, consist of an oligosaccharide backbone of β-1,4-linked N-acetyl-D-glucosamine (“GlcNAc”) residues with an N-linked fatty acyl chain condensed at the non-reducing end. As understood in the art, LCOs differ in the number of GlcNAc residues in the backbone, in the length and degree of saturation of the fatty acyl chain and in the substitutions of reducing and non-reducing sugar residues),

linoleic acid or derivatives thereof, linolenic acid or derivatives thereof, maleic hydrazide, mepiquat chloride, mepiquat pentaborate, 1-methylcyclopropene, 3-methylcyclopropene, 1-ethylcyclopropene, 1-n-propylcyclopropene, 1-cyclopropenylmethanol, methoxyvinylglycin (MVG), 3'-methyl abscisic acid, 1-(4-methylphenyl)-N-(2-oxo-1-propyl-1,2,3,4-tetrahydroquinolin-6-yl)methanesulfonamide and related substituted tetrahydroquinolin-6-yl)methanesulfonamides, (3E,3aR,8bS)-3-(((2R)-4-Methyl-5-oxo-2,5-dihydrofuran-2-yl]oxy)methylen)-3,3a,4,8b-tetrahydro-2H-indeno[1,2-b]furan-2-one and related lactones as outlined in EP2248421, 2-(1-naphthyl)acetamide, 1-naphthylacetic acid, 2-naphthoxyacetic acid, nitrophenolate-mixture, 4-Oxo-4[(2-phenylethyl)amino]butyric acid, paclobutrazol, 4-phenylbutyric acid and its related salts (e.g. sodium-4-phenylbutanoate, potassium-4-phenylbutanoate), phenylalanine, N-phenylphthalamic acid, prohexadione, prohexadione-calcium, putrescine, prohydrojasmon, rhizobitoxin, salicylic acid, salicylic acid methyl ester, sarcosine, sodium cycloprop-1-en-1-yl acetate, sodium cycloprop-2-en-1-yl acetate, sodium-3-(cycloprop-2-en-1-yl)propanoate, sodium-3-(cycloprop-1-en-1-yl) propanoate, sidfungin, spermidine, spermine, strigolactone, tecnazene, thidiazuron, triacontanol, trinexapac, trinexapac-ethyl, tryptophan, tsitodef, uniconazole, uniconazole-P, 2-fluoro-N-(3-methoxyphenyl)-9H-purin-6-amine.

Examples of safeners which could be mixed with the compound and the composition of the invention are:

S1) Compounds from the group of heterocyclic carboxylic acid derivatives:

S1^a) Compounds of the dichlorophenylpyrazoline-3-carboxylic acid type (S1^a), preferably compounds such as 1-(2,4-dichlorophenyl)-5-(ethoxycarbonyl)-5-methyl-2-pyrazoline-3-carboxylic acid, ethyl 1-(2,4-dichlorophenyl)-5-(ethoxycarbonyl)-5-methyl-2-pyrazoline-3-carboxylate (S1-1) ("mefenpyr-diethyl"), and related compounds as described in WO-A-91/07874;

S1^b) Derivatives of dichlorophenylpyrazolecarboxylic acid (S1^b), preferably compounds such as ethyl 1-(2,4-dichlorophenyl)-5-methylpyrazole-3-carboxylate (S1-2), ethyl 1-(2,4-dichlorophenyl)-5-isopropylpyrazole-3-carboxylate (S1-3), ethyl 1-(2,4-dichlorophenyl)-5-(1,1-dimethylethyl)pyrazole-3-carboxylate (S1-4) and related compounds as described in EP-A-333131 131 and EP-A-269806;

S1^c) Derivatives of 1,5-diphenylpyrazole-3-carboxylic acid (S1^c), preferably compounds such as ethyl 1-(2,4-dichlorophenyl)-5-phenylpyrazole-3-carboxylate (S1-5), methyl 1-(2-chlorophenyl)-5-phenylpyrazole-3-carboxylate (S1-6) and related compounds as described, for example, in EP-A-268554;

S1^d) Compounds of the triazolecarboxylic acid type (S1^d), preferably compounds such as fenclorazole (ethyl ester), i.e. ethyl 1-(2,4-dichlorophenyl)-5-trichloromethyl-1H-1,2,4-triazole-3-carboxylate (S1-7), and related compounds, as described in EP-A-174562 and EP-A-346620;

S1^e) Compounds of the 5-benzyl- or 5-phenyl-2-isoxazoline-3-carboxylic acid or of the 5,5-diphenyl-2-isoxazoline-3-carboxylic acid type (S1^e), preferably compounds such as ethyl 5-(2,4-dichlorobenzyl)-

2-isoxazoline-3-carboxylate (S1-8) or ethyl 5-phenyl-2-isoxazoline-3-carboxylate (S1-9) and related compounds as described in WO-A-91/08202, or 5,5-diphenyl-2-isoxazolinecarboxylic acid (S1-10) or ethyl 5,5-diphenyl-2-isoxazoline-3-carboxylate (S1-11) ("isoxadifen-ethyl") or n-propyl 5,5-diphenyl-2-isoxazoline-3-carboxylate (S1-12) or ethyl 5-(4-fluorophenyl)-5-phenyl-2-isoxazoline-3-carboxylate (S1-13), as described in patent application WO-A-95/07897.

S2) Compounds from the group of the 8-quinolinoxy derivatives (S2):

S2^a) Compounds of the 8-quinolinoxyacetic acid type (S2^a), preferably 1-methylhexyl (5-chloro-8-quinolinoxy)acetate ("cloquintocet-mexyl") (S2-1), 1,3-dimethylbut-1-yl (5-chloro-8-quinolinoxy)acetate (S2-2), 4-allyloxybutyl (5-chloro-8-quinolinoxy)acetate (S2-3), 1-allyloxyprop-2-yl (5-chloro-8-quinolinoxy)acetate (S2-4), ethyl (5-chloro-8-quinolinoxy)acetate (S2-5), methyl 5-chloro-8-quinolinoxyacetate (S2-6), allyl (5-chloro-8-quinolinoxy)acetate (S2-7), 2-(2-propylideneiminoxy)-1-ethyl (5-chloro-8-quinolinoxy)acetate (S2-8), 2-oxoprop-1-yl (5-chloro-8-quinolinoxy)acetate (S2-9) and related compounds, as described in EP-A-86750, EP-A-94349 and EP-A-191736 or EP-A-0 492 366, and also (5-chloro-8-quinolinoxy)acetic acid (S2-10), hydrates and salts thereof, for example the lithium, sodium, potassium, calcium, magnesium, aluminum, iron, ammonium, quaternary ammonium, sulfonium or phosphonium salts thereof, as described in WO-A-2002/34048;

S2^b) Compounds of the (5-chloro-8-quinolinoxy)malonic acid type (S2^b), preferably compounds such as diethyl (5-chloro-8-quinolinoxy)malonate, diallyl (5-chloro-8-quinolinoxy)malonate, methyl ethyl (5-chloro-8-quinolinoxy)malonate and related compounds, as described in EP-A-0 582 198.

S3) Active compounds of the dichloroacetamide type (S3), which are frequently used as pre-emergence safeners (soil-acting safeners), for example "dichlormid" (N,N-diallyl-2,2-dichloroacetamide) (S3-1), "R-29148" (3-dichloroacetyl-2,2,5-trimethyl-1,3-oxazolidine) from Stauffer (S3-2), "R-28725" (3-dichloroacetyl-2,2-dimethyl-1,3-oxazolidine) from Stauffer (S3-3), "benoxacor" (4-dichloroacetyl-3,4-dihydro-3-methyl-2H-1,4-benzoxazine) (S3-4), "PPG-1292" (N-allyl-N-[(1,3-dioxolan-2-yl)methyl]dichloroacetamide) from PPG Industries (S3-5), "DKA-24" (N-allyl-N-[(allylaminocarbonyl)methyl]dichloroacetamide) from Sagro-Chem (S3-6), "AD-67" or "MON 4660" (3-dichloroacetyl-1-oxa-3-azaspiro[4.5]decane) from Nitrokemia or Monsanto (S3-7), "TI-35" (1-dichloroacetylazepane) from TRI-Chemical RT (S3-8), "Diclonon" (Dicyclonon) or "BAS145138" or "LAB145138" (S3-9) ((RS)-1-dichloroacetyl-3,3,8a-trimethylperhydropyrrolo[1,2-a]pyrimidin-6-one) from BASF, "furilazole" or "MON 13900" ((RS)-3-dichloroacetyl-5-(2-furyl)-2,2-dimethylloxazolidine) (S3-10), and the (R) isomer thereof (S3-11).

S4) Compounds from the class of the acylsulfonamides (S4):

S4^a) N-Acylsulfonamides and salts thereof, as described in WO-A-97/45016,

S4^b) Compounds of the 4-(benzoylsulfamoyl)benzamide type and salts thereof, as described in WO-A-99/16744,

S4^c) Compounds from the class of the benzoylsulfamoylphenylureas as described in EP-A-365484,
5 for example 1-[4-(N-2-methoxybenzoylsulfamoyl)phenyl]-3-methylurea, 1-[4-(N-2-methoxybenzoyl-
sulfamoyl)phenyl]-3,3-dimethylurea and 1-[4-(N-4,5-dimethylbenzoylsulfamoyl)phenyl]-3-methylurea;

S4^d) Compounds of the N-phenylsulfonylterephthalamide type and salts thereof, which are known, for example, from CN 101838227.

S5) Active compounds from the class of the hydroxyaromatics and the aromatic-aliphatic carboxylic
10 acid derivatives (S5), for example ethyl 3,4,5-triacetoxybenzoate, 3,5-dimethoxy-4-hydroxybenzoic acid,
3,5-dihydroxybenzoic acid, 4-hydroxysalicylic acid, 4-fluorosalicylic acid, 2-hydroxycinnamic acid,
2,4-dichlorocinnamic acid, as described in WO-A-2004/084631, WO-A-2005/015994, WO-A-
2005/016001.

S6) Active compounds from the class of the 1,2-dihydroquinoxalin-2-ones (S6), for example 1-
15 methyl-3-(2-thienyl)-1,2-dihydroquinoxalin-2-one, 1-methyl-3-(2-thienyl)-1,2-dihydroquinoxaline-2-
thione, 1-(2-aminoethyl)-3-(2-thienyl)-1,2-dihydroquinoxalin-2-one hydrochloride, 1-(2-
methylsulfonylaminoethyl)-3-(2-thienyl)-1,2-dihydroquinoxalin-2-one, as described in WO-A-
2005/112630.

S7) Compounds from the class of the diphenylmethoxyacetic acid derivatives (S7), e.g. methyl
20 diphenylmethoxyacetate (CAS Reg. No. 41858-19-9) (S7-1), ethyl diphenylmethoxyacetate or
diphenylmethoxyacetic acid, as described in WO-A-98/38856.

S8) 2-fluoroacrylic acid derivatives as described in WO-A-98/27049.

S9) active compounds from the class of the 3-(5-tetrazolylcarbonyl)-2-quinolones (S9), for example
1,2-dihydro-4-hydroxy-1-ethyl-3-(5-tetrazolylcarbonyl)-2-quinolone (CAS Reg. No. 219479-18-2), 1,2-
25 dihydro-4-hydroxy-1-methyl-3-(5-tetrazolylcarbonyl)-2-quinolone (CAS Reg. No. 95855-00-8), as
described in WO-A-199/000020;

S10) N-acylsulfonamides as described in WO-A-2007/023719 and WO-A-2007/023764.

S11) Active compounds of the oxyimino compound type (S11), which are known as seed-dressing
agents, for example

30 "oxabetrinil" ((Z)-1,3-dioxolan-2-ylmethoxyimino(phenyl)acetonitrile) (S11-1), which is known as a
seed-dressing safener for millet/sorghum against metolachlor damage,

"fluxofenim" (1-(4-chlorophenyl)-2,2,2-trifluoro-1-ethanone O-(1,3-dioxolan-2-ylmethyl)oxime) (S11-2), which is known as a seed-dressing safener for millet/sorghum against metolachlor damage, and "cyometrinil" or "CGA-43089" ((Z)-cyanomethoxyimino(phenyl)acetonitrile) (S11-3), which is known as a seed-dressing safener for millet/sorghum against metolachlor damage.

5 S12) active compounds from the class of the isothiochromanones (S12), for example methyl [(3-oxo-1H-2-benzothiopyran-4(3H)-ylidene)methoxy]acetate (CAS Reg. No. 205121-04-6) (S12-1) and related compounds from WO-A-1998/13361.

S13) One or more compounds from group (S13):

10 "naphthalic anhydride" (1,8-naphthalenedicarboxylic anhydride) (S13-1), which is known as a seed-dressing safener for corn against thiocarbamate herbicide damage,

"fencloirim" (4,6-dichloro-2-phenylpyrimidine) (S13-2), which is known as a safener for pretilachlor in sown rice,

"flurazole" (benzyl 2-chloro-4-trifluoromethyl-1,3-thiazole-5-carboxylate) (S13-3), which is known as a seed-dressing safener for millet/sorghum against alachlor and metolachlor damage,

15 "CL 304415" (CAS Reg. No. 31541-57-8)

(4-carboxy-3,4-dihydro-2H-1-benzopyran-4-acetic acid) (S13-4) from American Cyanamid, which is known as a safener for corn against damage by imidazolinones,

"MG 191" (CAS Reg. No. 96420-72-3) (2-dichloromethyl-2-methyl-1,3-dioxolane) (S13-5) from Nitrokemia, which is known as a safener for corn,

20 "MG 838" (CAS Reg. No. 133993-74-5)

(2-propenyl 1-oxa-4-azaspiro[4.5]decane-4-carbodithioate) (S13-6) from Nitrokemia

"disulfoton" (O,O-diethyl S-2-ethylthioethyl phosphorodithioate) (S13-7),

"dietholate" (O,O-diethyl O-phenyl phosphorothioate) (S13-8),

"mephenate" (4-chlorophenyl methylcarbamate) (S13-9).

25 S14) active compounds which, in addition to herbicidal action against weeds, also have safener action on crop plants such as rice, for example

"dimepiperate" or "MY-93" (S-1-methyl 1-phenylethylpiperidine-1-carbothioate), which is known as a safener for rice against damage by the herbicide molinate,

30 "daimuron" or "SK 23" (1-(1-methyl-1-phenylethyl)-3-p-tolylurea), which is known as safener for rice against imazosulfuron herbicide damage,

"cumyluron" = "JC-940" (3-(2-chlorophenylmethyl)-1-(1-methyl-1-phenylethyl)urea, see JP-A-60087254), which is known as safener for rice against damage by some herbicides,

"methoxyphenone" or "NK 049" (3,3'-dimethyl-4-methoxybenzophenone), which is known as a safener for rice against damage by some herbicides,

"CSB" (1-bromo-4-(chloromethylsulfonyl)benzene) from Kumiai, (CAS Reg. No. 54091-06-4), which is known as a safener against damage by some herbicides in rice.

S15) Pyridine-2-oxy-3-carbonamides as described in WO-A-2008/131861 and WO-A-2008/131860.

S16) Active compounds which are used primarily as herbicides but also have safener action on crop plants, for example (2,4-dichlorophenoxy)acetic acid (2,4-D), (4-chlorophenoxy)acetic acid, (R,S)-2-(4-chloro-o-tolyloxy)propionic acid (mecoprop), 4-(2,4-dichlorophenoxy)butyric acid (2,4-DB), (4-chloro-o-tolyloxy)acetic acid (MCPA), 4-(4-chloro-o-tolyloxy)butyric acid, 4-(4-chlorophenoxy)butyric acid, 3,6-dichloro-2-methoxybenzoic acid (dicamba), 1-(ethoxycarbonyl)ethyl 3,6-dichloro-2-methoxybenzoate (lactidichlor-ethyl).

10 Examples of nitrification inhibitors which can be mixed with the compound and the composition of the invention are selected from the group consisting of 2-(3,4-dimethyl-1H-pyrazol-1-yl)succinic acid, 2-(4,5-dimethyl-1H-pyrazol-1-yl)succinic acid, 3,4-dimethyl pyrazolium glycolate, 3,4-dimethyl pyrazolium citrate, 3,4-dimethyl pyrazolium lactate, 3,4-dimethyl pyrazolium mandelate, 1,2,4-triazole, 4-Chloro-3-methylpyrazole, N-((3(5)-methyl-1H-pyrazole-1-yl)methyl)acetamide, N-((3(5)-methyl-1 H-pyrazole-1-yl)methyl)formamide, N-((3(5),4-dimethylpyrazole-1-yl)methyl)formamide, N-((4-chloro-3(5)-methylpyrazole-1-yl)methyl)formamide; reaction adducts of dicyandiamide, urea and formaldehyde, triazonyl-formaldehyde-dicyandiamide adducts, 2-cyano-1-((4-oxo-1,3,5-triazinan-1-yl)methyl)guanidine, 1-((2-cyanoguanidino)methyl)urea, 2-cyano-1-((2-cyanoguanidino)methyl)guanidine, 2-chloro-6-(trichloromethyl)-pyridine (nitrapyrin or N-serve), dicyandiamide, 3,4-dimethyl pyrazole phosphate, 4,5-dimethyl pyrazole phosphate, 3,4-dimethylpyrazole, 4,5-dimethyl pyrazole, ammoniumthiosulfate, neem, products based on ingredients of neem, linoleic acid, alpha-linolenic acid, methyl p-coumarate, methyl ferulate, methyl 3-(4-hydroxyphenyl) propionate, karanjin, brachialacton, p-benzoquinone sorgoleone, 4-amino-1,2,4-triazole hydrochloride, 1-amido-2-thiourea, 2-amino-4-chloro-6-methylpyrimidine, 2-mercapto-benzothiazole, 5-ethoxy-3-trichloromethyl-1,2,4-thiodiazole (terrazole, etridiazole), 2-sulfanilamidothiazole, 3-methylpyrazol, 1,2,4-triazol thiourea, cyan amide, melamine, zeolite powder, catechol, benzoquinone, sodium tetraborate, allylthiourea, chlorate salts, and zinc sulfate.

The compound and the composition of the invention may be combined with one or more agriculturally beneficial agents.

30 Examples of agriculturally beneficial agents include biostimulants, plant growth regulators, plant signal molecules, growth enhancers, microbial stimulating molecules, biomolecules, soil amendments, nutrients, plant nutrient enhancers, etc., such as lipo-chitooligosaccharides (LCO), chitooligosaccharides (CO), chitinous compounds, flavonoids, jasmonic acid or derivatives thereof (e.g., jasmonates), cytokinins, auxins, gibberellins, abscisic acid, ethylene, brassinosteroids, salicylates, macro- and micro-nutrients, linoleic acid or derivatives thereof, linolenic acid or derivatives thereof, karrikins, and beneficial

microorganisms (e.g., *Rhizobium* spp., *Bradyrhizobium* spp., *Sinorhizobium* spp., *Azorhizobium* spp., *Glomus* spp., *Gigaspora* spp., *Hymenoscyphous* spp., *Oidiodendron* spp., *Laccaria* spp., *Pisolithus* spp., *Rhizopogon* spp., *Scleroderma* spp., *Rhizoctonia* spp., *Acinetobacter* spp., *Arthrobacter* spp., *Arthrotrix* spp., *Aspergillus* spp., *Azospirillum* spp., *Bacillus* spp., *Burkholderia* spp., *Candida* spp., *Chryseomonas* spp., *Enterobacter* spp., *Eupenicillium* spp., *Exiguobacterium* spp., *Klebsiella* spp., *Kluyvera* spp., *Microbacterium* spp., *Mucor* spp., *Paecilomyces* spp., *Paenibacillus* spp., *Penicillium* spp., *Pseudomonas* spp., *Serratia* spp., *Stenotrophomonas* spp., *Streptomyces* spp., *Streptosporangium* spp., *Swaminathania* spp., *Thiobacillus* spp., *Torulospora* spp., *Vibrio* spp., *Xanthobacter* spp., *Xanthomonas* spp., etc.), and combinations thereof.

10 According to some embodiments, the compound and the composition of the invention may be combined with one or more biostimulants. Biostimulants may enhance metabolic or physiological processes such as respiration, photosynthesis, nucleic acid uptake, ion uptake, nutrient delivery, or a combination thereof. Non-limiting examples of biostimulants that may be included or used in the composition of the present invention may include seaweed extracts (e.g., *ascophyllum nodosum*; BAYFOLAN ALGAE, Aglukon gmbH, Germany), bacterial extracts (e.g., extracts of one or more diazotrophs, phosphate-solubilizing microorgafjaponisms and/or biopesticides), fungal extracts, humic acids (e.g., potassium humate), fulvic acids, myo-inositol, and/or glycine, protein hydrolysates and amino-acids both from animal BAYFOLAN AMBITION & BAYFOLAN cobre, SICIT, Italy) and plant origin, inorganic compounds (e.g silica) and any combinations thereof. According to some embodiments, the biostimulants may comprise one or more

20 *Azospirillum* extracts (e.g., an extract of media comprising *A. brasilense* INTA Az-39), one or more *Bradyrhizobium* extracts (e.g., an extract of media comprising *B. elkanii* SEMIA 501, *B. elkanii* SEMIA 587, *B. elkanii* SEMIA 5019, *B. japonicum* NRRL B-50586 (also deposited as NRRL B-59565), *B. japonicum* NRRL B-50587 (also deposited as NRRL B-59566), *B. japonicum* NRRL B-50588 (also deposited as NRRL B-59567), *B. japonicum* NRRL B-50589 (also deposited as NRRL B-59568), *B.*

25 *japonicum* NRRL B-50590 (also deposited as NRRL B-59569), *B. japonicum* NRRL B-50591 (also deposited as NRRL B-59570), *B. japonicum* NRRL B-50592 (also deposited as NRRL B-59571), *B. japonicum* NRRL B-50593 (also deposited as NRRL B-59572), *B. japonicum* NRRL B-50594 (also deposited as NRRL B-50493), *B. japonicum* NRRL B-50608, *B. japonicum* NRRL B-50609, *B. japonicum* NRRL B-50610, *B. japonicum* NRRL B-50611, *B. japonicum* NRRL B-50612, *B. japonicum* NRRL B-

30 50726, *B. japonicum* NRRL B-50727, *B. japonicum* NRRL B-50728, *B. japonicum* NRRL B-50729, *B. japonicum* NRRL B-50730, *B. japonicum* SEMIA 566, *B. japonicum* SEMIA 5079, *B. japonicum* SEMIA 5080, *B. japonicum* USDA 6, *B. japonicum* USDA 110, *B. japonicum* USDA 122, *B. japonicum* USDA 123, *B. japonicum* USDA 127, *B. japonicum* USDA 129 and/or *B. japonicum* USDA 532C), one or more *Rhizobium* extracts (e.g., an extract of media comprising *R. leguminosarum* SO12A-2), one or more

35 *Sinorhizobium* extracts (e.g., an extract of media comprising *S. fredii* CCBAU114 and/or *S. fredii* USDA 205), one or more *Penicillium* extracts (e.g., an extract of media comprising *P. bilaiae* ATCC 18309, *P. bilaiae* ATCC 20851, *P. bilaiae* ATCC 22348, *P. bilaiae* NRRL 50162, *P. bilaiae* NRRL 50169, *P. bilaiae*

NRRL 50776, *P. bilaiae* NRRL 50777, *P. bilaiae* NRRL 50778, *P. bilaiae* NRRL 50777, *P. bilaiae* NRRL 50778, *P. bilaiae* NRRL 50779, *P. bilaiae* NRRL 50780, *P. bilaiae* NRRL 50781, *P. bilaiae* NRRL 50782, *P. bilaiae* NRRL 50783, *P. bilaiae* NRRL 50784, *P. bilaiae* NRRL 50785, *P. bilaiae* NRRL 50786, *P. bilaiae* NRRL 50787, *P. bilaiae* NRRL 50788, *P. bilaiae* RS7B-SD1, *P. brevicompactum* AgRF18, *P. canescens* ATCC 10419, *P. expansum* ATCC 24692, *P. expansum* YT02, *P. fellatanum* ATCC 48694, *P. gaestrivorus* NRRL 50170, *P. glabrum* DAOM 239074, *P. glabrum* CBS 229.28, *P. janthinellum* ATCC 10455, *P. lanosocoeruleum* ATCC 48919, *P. radicum* ATCC 201836, *P. radicum* FRR 4717, *P. radicum* FRR 4719, *P. radicum* N93/47267 and/or *P. raistrickii* ATCC 10490), one or more *Pseudomonas* extracts (e.g., an extract of media comprising *P. jessenii* PS06), one or more acaricidal, insecticidal and/or nematicidal extracts (e.g., an extract of media comprising *Bacillus firmus* I-1582, *Bacillus mycoides* AQ726, NRRL B-21664; *Beauveria bassiana* ATCC-74040, *Beauveria bassiana* ATCC-74250, *Burkholderia* sp. A396 sp. nov. rinojensis, NRRL B-50319, *Chromobacterium subtsugae* NRRL B-30655, *Chromobacterium vaccinii* NRRL B-50880, *Flavobacterium* H492, NRRL B-50584, *Metarhizium anisopliae* F52 (also known as *Metarhizium anisopliae* strain 52, *Metarhizium anisopliae* strain 7, *Metarhizium anisopliae* strain 43 and *Metarhizium anisopliae* BIO-1020, TAE-001; deposited as DSM 3884, DSM 3885, ATCC 90448, SD 170 and ARSEF 7711) and/or *Paecilomyces fumosoroseus* FE991), and/or one or more fungicidal extracts (e.g., an extract of media comprising *Ampelomyces quisqualis* AQ 10® (Intrachem Bio GmbH & Co. KG, Germany), *Aspergillus flavus* AFLA-GUARD® (Syngenta Crop Protection, Inc., CH), *Aureobasidium pullulans* BOTECTOR® (bio-ferm GmbH, Germany), *Bacillus pumilus* AQ717 (NRRL B-21662), *Bacillus pumilus* NRRL B-30087, *Bacillus* AQ175 (ATCC 55608), *Bacillus* AQ177 (ATCC 55609), *Bacillus subtilis* AQ713 (NRRL B-21661), *Bacillus subtilis* AQ743 (NRRL B-21665), *Bacillus amyloliquefaciens* FZB24, *Bacillus amyloliquefaciens* NRRL B-50349, *Bacillus amyloliquefaciens* TJ1000 (also known as 1BE, isolate ATCC BAA-390), *Bacillus thuringiensis* AQ52 (NRRL B-21619), *Candida oleophila* I-82 (e.g., ASPIRE® from Ecogen Inc., USA), *Candida saitoana* BIOCURE® (in mixture with lysozyme; BASF, USA) and BIOCOAT® (ArystaLife Science, Ltd., Cary, NC), *Clonostachys rosea* f. *catenulata* (also referred to as *Gliocladium catenulatum*) J1446 (PRESTOP®, Verdera, Finland), *Coniothyrium minitans* CONTANS® (Prophyta, Germany), *Cryphonectria parasitica* (CNICM, France), *Cryptococcus albidus* YIELD PLUS® (Anchor Bio-Technologies, South Africa), *Fusarium oxysporum* BIOFOX® (from S.I.A.P.A., Italy) and FUSACLEAN® (Natural Plant Protection, France), *Metschnikowia fructicola* SHEMER® (Agrogreen, Israel), *Microdochium dimerum* ANTIBOT® (Agrauxine, France), *Muscodor albus* NRRL 30547, *Muscodor roseus* NRRL 30548, *Phlebiopsis gigantea* ROTSOP® (Verdera, Finland), *Pseudozyma flocculosa* SPORODEX® (Plant Products Co. Ltd., Canada), *Pythium oligandrum* DV74 (POLYVERSUM®, Remeslo SSRO, Biopreparaty, Czech Rep.), *Reynoutria sachlinensis* (e.g., REGALIA® from Marrone BioInnovations, USA), *Streptomyces* NRRL B-30145, *Streptomyces* M1064, *Streptomyces galbus* NRRL 30232, *Streptomyces lydicus* WYEC 108 (ATCC 55445), *Streptomyces violaceusniger* YCED 9 (ATCC 55660; DE-THATCH-9®, DECOMP-9® and THATCH CONTROL®,

Idaho Research Foundation, USA), *Streptomyces* WYE 53 (ATCC 55750; DE-THATCH-9®, DECOMP-9® and THATCH CONTROL®, Idaho Research Foundation, USA), *Talaromyces flavus* V117b (PROTUS®, Prophyta, Germany), *Trichoderma asperellum* SKT-1 (ECO-HOPE®, Kumiai Chemical Industry Co., Ltd., Japan), *Trichoderma atroviride* LC52 (SENTINEL®, Agrimm Technologies Ltd, NZ),
5 *Trichoderma harzianum* T-22 (PLANTSHIELD®, der Firma BioWorks Inc., USA), *Trichoderma harzianum* TH-35 (ROOT PRO®, from Mycontrol Ltd., Israel), *Trichoderma harzianum* T-39 (TRICHODEX®, Mycontrol Ltd., Israel; TRICHODERMA 2000®, Makhteshim Ltd., Israel), *Trichoderma harzianum* ICC012 and *Trichoderma viride* TRICHOPEL (Agrimm Technologies Ltd, NZ), *Trichoderma harzianum* ICC012 and *Trichoderma viride* ICC080 (REMEDIER® WP, Isagro Ricerca,
10 Italy), *Trichoderma polysporum* and *Trichoderma harzianum* (BINAB®, BINAB Bio-Innovation AB, Sweden), *Trichoderma stromaticum* TRICOVAB® (C.E.P.L.A.C., Brazil), *Trichoderma virens* GL-21 (SOILGARD®, Certis LLC, USA), *Trichoderma virens* G1-3, ATCC 57678, *Trichoderma virens* G1-21 (Thermo Trilog Corporation, Wasco, CA), *Trichoderma virens* G1-3 and *Bacillus amyloliquefaciens* FZB2, *Trichoderma virens* G1-3 and *Bacillus amyloliquefaciens* NRRL B-50349, *Trichoderma virens*
15 G1-3 and *Bacillus amyloliquefaciens* TJ1000, *Trichoderma virens* G1-21 and *Bacillus amyloliquefaciens* FZB24, *Trichoderma virens* G1-21 and *Bacillus amyloliquefaciens* NRRL B-50349, *Trichoderma virens* G1-21 and *Bacillus amyloliquefaciens* TJ1000, *Trichoderma viride* TRIECO® (Ecosense Labs. (India) Pvt. Ltd., Indien, BIO-CURE® F from T. Stanes & Co. Ltd., Indien), *Trichoderma viride* TV1 (Agribiotec srl, Italy), *Trichoderma viride* ICC080, and/or *Ulocladium oudemansii* HRU3 (BOTRY-ZEN®,
20 Botry-Zen Ltd, NZ)), and combinations thereof.

According to some embodiments, the compound and the composition of the invention may be combined with one or more lipo-chitooligosaccharides (LCOs), chitooligosaccharides (COs), and/or chitinous compounds. LCOs, sometimes referred to as symbiotic nodulation (Nod) signals (or Nod factors) or as Myc factors, consist of an oligosaccharide backbone of β -1,4-linked *N*-acetyl-D-glucosamine (“GlcNAc”)
25 residues with an N-linked fatty acyl chain condensed at the non-reducing end. As understood in the art, LCOs differ in the number of GlcNAc residues in the backbone, in the length and degree of saturation of the fatty acyl chain and in the substitutions of reducing and non-reducing sugar residues. *See, e.g.,* Denarie *et al., Ann. Rev. Biochem.* 65:503 (1996); Diaz *et al., Mol. Plant-Microbe Interactions* 13:268 (2000); Hungria *et al., Soil Biol. Biochem.* 29:819 (1997); Hamel *et al., Planta* 232:787 (2010); and Prome *et al., Pure & Appl. Chem.* 70(1):55 (1998).
30

LCOs (and derivatives thereof) may be included or utilized in various forms of purity and can be used alone or in the form of a culture of LCO-producing bacteria or fungi. For example, OPTIMIZE® (commercially available from Bayer Company) contains a culture of *Bradyrhizobium japonicum* that produces LCO. Methods to provide substantially pure LCOs include removing the microbial cells from a
35 mixture of LCOs and the microbe, or continuing to isolate and purify the LCO molecules through LCO solvent phase separation followed by HPLC chromatography as described, for example, in U.S. Patent No.

5,549,718. Purification can be enhanced by repeated HPLC and the purified LCO molecules can be freeze-dried for long-term storage. Compositions and methods of the present disclosure may comprise analogues, derivatives, hydrates, isomers, salts and/or solvates of LCOs. LCOs may be incorporated into the composition according to the invention in any suitable amount(s)/concentration(s). For example, the composition according to the invention comprise about 1×10^{-20} M to about 1×10^{-1} M LCO(s). The amount/concentration of LCO may be an amount effective to impart a positive trait or benefit to a plant, such as to enhance the growth and/or yield of the plant to which the composition is applied. According to some embodiments, the LCO amount/concentration is not effective to enhance the yield of the plant without beneficial contributions from one or more other constituents of the composition, such as CO and/or one or more pesticides.

The compound and the composition of the invention may be combined with any suitable COs, perhaps in combination with one or more LCOs. COs differ from LCOs in that they lack the pendant fatty acid chain that is characteristic of LCOs. COs, sometimes referred to as N-acetylchitooligosaccharides, are also composed of GlcNAc residues but have side chain decorations that make them different from chitin molecules $[(C_8H_{13}NO_5)_n]$, CAS No. 1398-61-4] and chitosan molecules $[(C_5H_{11}NO_4)_n]$, CAS No. 9012-76-4]. See, e.g., D'Haeze *et al.*, *Glycobiol.* 12(6):79R (2002); Demont-Caulet *et al.*, *Plant Physiol.* 120(1):83 (1999); Hanel *et al.*, *Planta* 232:787 (2010); Muller *et al.*, *Plant Physiol.* 124:733 (2000); Robina *et al.*, *Tetrahedron* 58:521-530 (2002); Rouge *et al.*, Docking of Chitin Oligomers and Nod Factors on Lectin Domains of the LysM-RLK Receptors in the Medicago-Rhizobium Symbiosis, in *The Molecular Immunology of Complex Carbohydrates-3* (Springer Science, 2011); Van der Holst *et al.*, *Curr. Opin. Struc. Biol.* 11:608 (2001); and Wan *et al.*, *Plant Cell* 21:1053 (2009). COs may be obtained from any suitable source. For example, the CO may be derived from an LCO. For example, in an aspect, the composition according to the invention comprise one or more COs derived from an LCO obtained (i.e., isolated and/or purified) from a strain of *Azorhizobium*, *Bradyrhizobium* (e.g., *B. japonicum*), *Mesorhizobium*, *Rhizobium* (e.g., *R. leguminosarum*), *Sinorhizobium* (e.g., *S. meliloti*), or mycorrhizal fungi (e.g., *Glomus intraradicus*). Alternatively, the CO may be synthetic. Methods for the preparation of recombinant COs are known in the art. See, e.g., Cottaz *et al.*, *Meth. Eng.* 7(4):311 (2005); Samain *et al.*, *Carbohydrate Res.* 302:35 (1997.); and Samain *et al.*, *J. Biotechnol.* 72:33 (1999), the contents and disclosures of which are incorporated herein by reference.

COs (and derivatives thereof) may be included or utilized in various forms of purity and can be used alone or in the form of a culture of CO-producing bacteria or fungi. It is to be understood that the compound and the composition of the invention may be combined with hydrates, isomers, salts and/or solvates of COs. COs may be used in any suitable amount(s)/concentration(s). For example, the composition according to the invention may comprise about 1×10^{-20} M to about 1×10^{-1} M COs. The amount/concentration of CO may be an amount effective to impart or confer a positive trait or benefit to a plant, such as to enhance the soil microbial environment, nutrient uptake, or increase the growth and/or

yield of the plant to which the composition is applied. According to some embodiments, a CO amount/concentration may not be effective to enhance the growth of the plant without beneficial contributions from one or more other ingredients of the composition, such as LCO and/or one or more inoculants, biomolecules, nutrients, or pesticides.

5 The compound and the composition of the invention may be combined with one or more suitable chitinous compounds, such as, for example, chitin, chitosan, and isomers, salts and solvates thereof. Chitins and chitosans, which are major components of the cell walls of fungi and the exoskeletons of insects and crustaceans, are composed of GlcNAc residues. Chitins and chitosans may be obtained commercially or prepared from insects, crustacean shells, or fungal cell walls. Methods for the preparation of chitin and
10 chitosan are known in the art. *See, e.g.*, U.S. Patent Nos. 4,536,207 (preparation from crustacean shells) and 5,965,545 (preparation from crab shells and hydrolysis of commercial chitosan); and Pochanavanich *et al.*, *Lett. Appl. Microbiol.* 35:17 (2002) (preparation from fungal cell walls). Deacetylated chitins and chitosans may be obtained that range from less than 35% to greater than 90% deacetylation and cover a broad spectrum of molecular weights, e.g., low molecular weight chitosan oligomers of less than 15kD
15 and chitin oligomers of 0.5 to 2kD; “practical grade” chitosan with a molecular weight of about 15kD; and high molecular weight chitosan of up to 70kD. Chitin and chitosan compositions formulated for seed treatment are commercially available. Commercial products include, for example, ELEXA® (Plant Defense Boosters, Inc.) and BEYOND™ (Agrihouse, Inc.).

The compound and the composition of the invention may be combined with one or more suitable
20 flavonoids, including, but not limited to, anthocyanidins, anthoxanthins, chalcones, coumarins, flavanones, flavanonols, flavans and isoflavonoids, as well as analogues, derivatives, hydrates, isomers, polymers, salts and solvates thereof. Flavonoids are phenolic compounds having the general structure of two aromatic rings connected by a three-carbon bridge. Classes of flavonoids are known in the art. *See, e.g.*, Jain *et al.*, *J. Plant Biochem. & Biotechnol.* 11:1 (2002); and Shaw *et al.*, *Environ. Microbiol.* 11:1867
25 (2006), the contents and disclosures of which are incorporated herein by reference. Several flavonoid compounds are commercially available. Flavonoid compounds may be isolated from plants or seeds, e.g., as described in U.S. Patents 5,702,752; 5,990,291; and 6,146,668. Flavonoid compounds may also be produced by genetically engineered organisms, such as yeast. *See, e.g.*, Ralston *et al.*, *Plant Physiol.* 137:1375 (2005).

30 According to some embodiments, the compound and the composition of the invention may be combined with one or more flavanones, such as one or more of butin, eriodictyol, hesperetin, hesperidin, homoeriodictyol, isosakuranetin, naringenin, naringin, pinocembrin, poncirin, sakuranetin, sakuranin, and/or sterubin, one or more flavanonols, such as dihydrokaempferol and/or taxifolin, one or more flavans, such as one or more flavan-3-ols (e.g., catechin (C), catechin 3-gallate (Cg), epicatechins (EC),
35 epigallocatechin (EGC) epicatechin 3-gallate (ECg), epigallocatechin 3-gallate (EGCg), epiafzelechin,

fisetinidol, galocatechin (GC), galocatechin 3-gallate (GCg), guibourtinidol, mesquitol, robinetinidol, theaflavin-3-gallate, theaflavin-3'-gallate, theflavin-3,3'-digallate, thearubigin), flavan-4-ols (e.g., apiforol and/or luteoforol) and/or flavan-3,4-diols (e.g., leucocyanidin, leucodelphinidin, leucofisetinidin, leucomalvidin, luecopelargonidin, leucopeonidin, leucorobinetinidin, melacacidin and/or teracacidin) and/or dimers, trimers, oligomers and/or polymers thereof (e.g., one or more proanthocyanidins), one or more isoflavonoids, such as one or more isoflavones or flavonoid derivatives (e.g., biochanin A, daidzein, formononetin, genistein and/or glycitein), isoflavanes (e.g., equol, ionchocarpane and/or laxifloorane), isoflavandiols, isoflavenes (e.g., glabrene, hagin D and/or 2-methoxyjudaicin), coumestans (e.g., coumestrol, plicadin and/or wedelolactone), pterocarpanes, roetonoids, neoflavonoids (e.g., calophyllolide, coutareagenin, dalbergichromene, dalbergin, nivetin), and/or pterocarpanes (e.g., bitucarpin A, bitucarpin B, erybraedin A, erybraedin B, erythrabyscin II, erythrabysin-1, erycristagallin, glycinol, glyceollidins, glyceollins, glycyrrhizol, maackiain, medicarpin, morisianine, orientanol, phaseolin, pisatin, striatine, trifolirhizin), and combinations thereof. Flavonoids and their derivatives may be included in the present composition in any suitable form, including, but not limited to, polymorphic and crystalline forms.

Flavonoids may be included in the composition according to the invention in any suitable amount(s) or concentration(s). The amount/concentration of a flavonoid(s) may be an amount effective to impart a benefit to a plant, which may be indirectly through activity on soil microorganisms or other means, such as to enhance plant nutrition and/or yield. According to some embodiments, a flavonoid amount/concentration may not be effective to enhance the nutrition or yield of the plant without the beneficial contributions from one or more other ingredients of the composition, such as LCO, CO, and/or one or more pesticides.

The compound and the composition of the invention may be combined with one or more suitable non-flavonoid nod-gene inducer(s), including, but not limited to, jasmonic acid ([1R-[1 α ,2 β (Z)]]-3-oxo-2-(pentenyl)cyclopentaneacetic acid; JA), linoleic acid ((Z,Z)-9,12-Octadecadienoic acid) and/or linolenic acid ((Z,Z,Z)-9,12,15-octadecatrienoic acid), and analogues, derivatives, hydrates, isomers, polymers, salts and solvates thereof. Jasmonic acid and its methyl ester, methyl jasmonate (MeJA), collectively known as jasmonates, are octadecanoid-based compounds that occur naturally in some plants (e.g., wheat), fungi (e.g., *Botryodiplodia theobromae*, *Gibberella fujikuroi*), yeast (e.g., *Saccharomyces cerevisiae*) and bacteria (e.g., *Escherichia coli*). Linoleic acid and linolenic acid may be produced in the course of the biosynthesis of jasmonic acid. Jasmonates, linoleic acid and linolenic acid (and their derivatives) are reported to be inducers of nod gene expression or LCO production by rhizobacteria. See, e.g., Mabood *et al.*, PLANT PHYSIOL. BIOCHEM. 44(11):759 (2006); Mabood *et al.*, AGR. J. 98(2):289 (2006); Mabood *et al.*, FIELD CROPS RES.95(2-3):412 (2006); and Mabood & Smith, *Linoleic and linolenic acid induce the expression of nod genes in Bradyrhizobium japonicum* USDA 3, PLANT BIOL. (2001).

Derivatives of jasmonic acid, linoleic acid, and linolenic acid that may be included or used in combination with the compound and the composition according to the invention include esters, amides, glycosides and

salts thereof. Representative esters are compounds in which the carboxyl group of linoleic acid, linolenic acid, or jasmonic acid has been replaced with a --COR group, where R is an --OR¹ group, in which R¹ is: an alkyl group, such as a C₁-C₈ unbranched or branched alkyl group, e.g., a methyl, ethyl or propyl group; an alkenyl group, such as a C₂-C₈ unbranched or branched alkenyl group; an alkynyl group, such as a C₂-C₈ unbranched or branched alkynyl group; an aryl group having, for example, 6 to 10 carbon atoms; or a heteroaryl group having, for example, 4 to 9 carbon atoms, wherein the heteroatoms in the heteroaryl group can be, for example, N, O, P, or S. Representative amides are compounds in which the carboxyl group of linoleic acid, linolenic acid, or jasmonic acid has been replaced with a --COR group, where R is an NR²R³ group, in which R² and R³ are each independently: a hydrogen; an alkyl group, such as a C₁-C₈ unbranched or branched alkyl group, e.g., a methyl, ethyl or propyl group; an alkenyl group, such as a C₂-C₈ unbranched or branched alkenyl group; an alkynyl group, such as a C₂-C₈ unbranched or branched alkynyl group; an aryl group having, for example, 6 to 10 carbon atoms; or a heteroaryl group having, for example, 4 to 9 carbon atoms, wherein the heteroatoms in the heteroaryl group can be, for example, N, O, P, or S. Esters may be prepared by known methods, such as acid-catalyzed nucleophilic addition, wherein the carboxylic acid is reacted with an alcohol in the presence of a catalytic amount of a mineral acid. Amides may also be prepared by known methods, such as by reacting the carboxylic acid with the appropriate amine in the presence of a coupling agent, such as dicyclohexyl carbodiimide (DCC), under neutral conditions. Suitable salts of linoleic acid, linolenic acid and jasmonic acid include, for example, base addition salts. The bases that may be used as reagents to prepare metabolically acceptable base salts of these compounds include those derived from cations such as alkali metal cations (e.g., potassium and sodium) and alkaline earth metal cations (e.g., calcium and magnesium). These salts may be readily prepared by mixing a solution of linoleic acid, linolenic acid, or jasmonic acid with a solution of the base. The salts may be precipitated from solution and collected by filtration, or may be recovered by other means such as by evaporation of the solvent.

Non-flavonoid nod-gene inducers may be used in combination with the compound and the composition according to the invention in any suitable amount(s)/concentration(s). For example, the amount/concentration of non-flavonoid nod-gene inducers may be an amount effective to impart or confer a positive trait or benefit to a plant, such as to enhance the growth and/or yield of the plant to which the composition is applied. According to some embodiments, the amount/concentration of non-flavonoid nod-gene inducers may not be effective to enhance the growth and/or yield of the plant without beneficial contributions from one or more other ingredients of the composition, such as a LCO, CO and/or one or more pesticides.

The compound and the composition of the invention may be combined with karrakins, including but not limited to 2H-furo[2,3-c]pyran-2-ones, as well as analogues, derivatives, hydrates, isomers, polymers, salts and solvates thereof. Examples of biologically acceptable salts of karrakins include acid addition salts formed with biologically acceptable acids, examples of which include hydrochloride, hydrobromide,

sulphate or bisulphate, phosphate or hydrogen phosphate, acetate, benzoate, succinate, fumarate, maleate, lactate, citrate, tartrate, gluconate; methanesulphonate, benzenesulphonate and p-toluenesulphonic acid. Additional biologically acceptable metal salts may include alkali metal salts, with bases, examples of which include the sodium and potassium salts. Karrakins may be incorporated into the composition according to the invention in any suitable amount(s) or concentration(s). For example, the amount/concentration of a karrakin may be an amount or concentration effective to impart or confer a positive trait or benefit to a plant, such as to enhance the growth and/or yield of the plant to which the composition is applied. In an aspect, a karrakin amount/concentration may not be effective to enhance the growth and/or yield of the plant without beneficial contributions from one or more other ingredients of the composition, such as a LCO, CO and/or one or more pesticides.

The compound and the composition of the invention may be combined with one or more anthocyanidins and/or anthoxanthins, such as one or more of cyanidin, delphinidin, malvidin, pelargonidin, peonidin, petunidin, flavones (e.g., apigenin, baicalein, chrysin, 7,8-dihydroxyflavone, diosmin, flavoxate, 6-hydroxyflavone, luteolin, scutellarein, tangeritin and/or wogonin) and/or flavonols (e.g., amurensin, astragalin, azaleatin, azalein, fisetin, furanoflavonols galangin, gossypetin, 3-hydroxyflavone, hyperoside, icariin, isoquercetin, kaempferide, kaempferitrin, kaempferol, isorhamnetin, morin, myricetin, myricitrin, natsudaaidain, pachypodol, pyranoflavonols quercetin, quercitin, rhamnazin, rhamnetin, robinin, rutin, spiraeoside, troxerutin and/or zanthorhamnin), and combinations thereof.

The compound and the composition of the invention may be combined with gluconolactone and/or an analogue, derivative, hydrate, isomer, polymer, salt and/or solvate thereof. Gluconolactone may be incorporated into the composition according to the invention in any suitable amount(s)/concentration(s). For example, the amount/concentration of a gluconolactone amount/concentration may be an amount effective to impart or confer a positive trait or benefit to a plant, such as to enhance the growth and/or yield of the plant to which the composition is applied. In an aspect, the gluconolactone amount/concentration may not be effective to enhance the growth and/or yield of the plant without beneficial contributions from one or more other ingredients of the composition, such as a LCO, CO and/or one or more pesticides.

The compound and the composition of the invention may be combined with one or more suitable nutrient(s) and/or fertilizer(s), such as organic acids (e.g., acetic acid, citric acid, lactic acid, malic acid, taurine, etc.), macrominerals (e.g., phosphorous, calcium, magnesium, potassium, sodium, iron, etc.), trace minerals (e.g., boron, cobalt, chloride, chromium, copper, fluoride, iodine, iron, manganese, molybdenum, selenium, zinc, etc.), vitamins, (e.g., vitamin A, vitamin B complex (i.e., vitamin B₁, vitamin B₂, vitamin B₃, vitamin B₅, vitamin B₆, vitamin B₇, vitamin B₈, vitamin B₉, vitamin B₁₂, choline) vitamin C, vitamin D, vitamin E, vitamin K.), and/or carotenoids (α -carotene, β -carotene, cryptoxanthin, lutein, lycopene, zeaxanthin, etc.), and combinations thereof. In an aspect, the compound and the composition of the

invention may be combined with macro- and micronutrients of plants or microbes, including phosphorous, boron, chlorine, copper, iron, manganese, molybdenum and/or zinc. According to some embodiments, the compound and the composition of the invention may be combined with one or more beneficial micronutrients. Non-limiting examples of micronutrients for use in compositions described herein may include vitamins, (e.g., vitamin A, vitamin B complex (i.e., vitamin B1, vitamin B2, vitamin B3, vitamin B5, vitamin B6, vitamin B7, vitamin B8, vitamin B9, vitamin B12, choline) vitamin C, vitamin D, vitamin E, vitamin K, carotenoids (α -carotene, β -carotene, cryptoxanthin, lutein, lycopene, zeaxanthin, etc.), macrominerals (e.g., phosphorous, calcium, magnesium, potassium, sodium, iron, etc.), trace minerals (e.g., boron, cobalt, chloride, chromium, copper, fluoride, iodine, iron, manganese, molybdenum, selenium, zinc, etc.), organic acids (e.g., acetic acid, citric acid, lactic acid, malic acid, taurine, etc.), and combinations thereof (BAYFOLAN secure, BAYFOLAN complete, BAYFOLAN energy, BAYFOLAN power, Aglukon GmbH, Germany). In a particular aspect, compositions may comprise phosphorous, boron, chlorine, copper, iron, manganese, molybdenum, and/or zinc, and combinations thereof. For compositions comprising phosphorous, it is envisioned that any suitable source of phosphorous may be used. For example, phosphorus may be derived from a rock phosphate source, such as monoammonium phosphate, diammonium phosphate, monocalcium phosphate, super phosphate, triple super phosphate, and/or ammonium polyphosphate, an organic phosphorous source, or a phosphorous source capable of solubilization by one or more microorganisms (e.g., *Penicillium bilaiae*).

Formulation

In a further embodiment, the present invention is directed to a plant protection agent in the form of customary formulations containing the polymorphic form B of (5S)-3-[3-(3-chloro-2-fluorophenoxy)-6-methylpyridazin-4-yl]-5-(2-chloro-4-methylbenzyl)-5,6-dihydro-4H-1,2,4-oxadiazine of formula (I).

In a preferred embodiment of the present invention, the plant protection agent contains more than 90 wt.%, and preferably more than 95 wt.%, of the polymorphic form B of the compound of the formula (I) based on the total amount of all forms of the compound of the formula (I) present in the composition.

In a more preferred embodiment, the present invention is directed to a suspension concentrate (SC) formulation comprising polymorphic form B of compound of formula (I), one or more dispersants, one or more antifoam agents, one or more biocides, one or more rheological additives, one or more antifreeze agents and/or one or more carriers.

In a further embodiment the present invention relates to agrochemical formulations comprising polymorphic form B of compound of formula (I), their use for foliar application, their use at low spray volumes, their use by unmanned aerial systems (UAS), unmanned guided vehicles (UGV), and tractor mounted boom sprayers fitted with conventional nozzles, but also pulse width modulation spray nozzles or rotating disc droplet applicators, and their application for controlling agricultural diseases, in particular

on waxy leaves, and in particular the present invention relates to agrochemical compositions with a reduced drift, in particular in spray applications.

In one aspect, the invention refers to a formulation comprising:

- 5 a) polymorphic form B of compound of formula (I) and one or more further active ingredients like fungicides, bactericides, acaricides, nematocides, insecticides, biological control agents or herbicides,
- b) one or more drift reducing agent
- c) one or more spreading agents,
- d) one or more uptake enhancing agents,
- 10 e) one or more rain-fast additives,
- f) other formulants,
- g) one or more carriers to volume (1L or 1 kg).

In one preferred embodiment b) is a vegetable oil or a vegetable oil ester or diester and in another embodiment component b) is a polymeric drift reducing agent.

15 Drift reducing agents b)

Suitable drift reducing agents are poly(ethylene oxides), wherein the polymer has an average molecular weight preferably from 0.5 to 12 million g/mol, more preferred from 0.75 to 10 million g/mol, and most preferred from 1 to 8 million g/mol, and hydroxypropyl guar, as well as vegetable oils and vegetable oil esters and diesters (including esters with glycerine and propylene glycol).

20 Particularly preferred are methyl, ethyl, isopropyl, isobutyl, butyl, hexyl and ethylhexyl esters.

More preferred the vegetable oils and esters are selected from the group consisting of methyl oleate, methyl palmitate, rape seed oil methyl ester, isopropyl myristate, isopropyl palmitate, ethylhexyl palmitate, ethylhexyl oleate, mixture of ethylhexyl myristate/laurate, ethylhexyl laurate, mixture of ethylhexyl caprylate/caprinate, diisopropyl adipate, coconut oil propyleneglycol diester, sunflower oil, 25 rapeseed oil, corn oil, soybean oil, rice bran oil, olive oil, peanut oil, mixed caprylic and capric triglycerides, and mixed decanoyl and octanoyl glycerides.

Also suitable as drift reducing agent are mineral oils.

Spreading agents c)

Suitable spreading agents are selected from the group comprising mono- and diesters of sulfosuccinate metal salts with branched or linear alcohols comprising 1-10 carbon atoms, in particular alkali metal salts, more particular sodium salts, and most particular sodium dioctylsulfosuccinate; as well as organosilicone ethoxylates such as organomodified polysiloxanes/ trisiloxane alkoxyates with the following CAS No. 27306-78-1, 67674-67-3, 134180-76-0, e.g., Silwet® L77, Silwet® 408, Silwet® 806, BreakThru® S240, BreakThru® S278.

Other suitable spreading agents are ethoxylated diacetylene-diols with 1 to 6 EO, e.g. Surfynol® 420 and 440, as well as 1-hexanol, 3,5,5-trimethyl-, ethoxylated, propoxylated (CAS-No. 204336-40-3), e.g. Break-Thru® Vibrant.

Preferred are polyalkyleneoxide modified heptamethyltrisiloxane, more preferred selected from the group comprising the siloxane groups Poly(oxy-1,2-ethanediyl),.alpha.-methyl-.omega.-[3-[1,3,3,3-tetramethyl-1-[(trimethylsilyl)oxy]disiloxanyl]propoxy] (CAS-No. 27306-78-1), Poly(oxy-1,2-ethanediyl),.alpha.-[3-[1,3,3,3-tetramethyl-1-[(trimethylsilyl)oxy]disiloxanyl]propyl]-.omega.-hydroxy (CAS-No. 67674-67-3), and Oxirane, methyl-, polymer with oxirane, mono-3-1,3,3,3-tetramethyl-1-(trimethylsilyl)oxydisiloxanylpropyl ether (CAS-No. 134180-76-0).

Preferably the spreading agent is selected from the group comprising sodium dioctylsulfosuccinate, polyalkyleneoxide modified heptamethyltrisiloxane and ethoxylated diacetylene-diols.

Uptake enhancers d)

The uptake enhancer may also be selected from the following group of compounds:

Other suitable uptake enhancers are alcohol ethoxylates, preferably selected from the group comprising ethoxylated alcohols, propoxy-ethoxylated alcohols, ethoxylated carboxylic acids, propoxy-ethoxylated carboxylic acids, or ethoxylated mono-, di- or triesters of glycerine comprising fatty acids with 8-18 carbon atoms and an average of 5-40 EO units. Said ethoxylated or propoxy-ethoxylated alcohols or carboxylic acids are optionally further modified by addition of a methyl radical to the remaining alcohol functionality (cf. "Me end-capped"). The term "alcohols" according to d) refers to alcohols that can be branched or linear, saturated or unsaturated, with 6-22 carbon atoms and optionally carry additional substituents, such as OH groups. The term "carboxylic acids" according to d) refers to carboxylic acids that can be branched or linear, saturated or unsaturated, with 6-22 carbon atoms and optionally carry additional substituents, such as OH groups.

Suitable components according to d) by way of example are:

- ethoxylated linear and/or branched fatty alcohols (e.g. Genapol® X-type of Clariant) with 2-20 EO units;
 - methyl end-capped, ethoxylated linear and/or branched fatty alcohols (e.g. Genapol® XM-type of Clariant) comprising 2-20 EO units;
- 5
- ethoxylated coconut alcohols (e.g. Genapol® C-types of Clariant) comprising 2-20 EO units;
 - ethoxylated C12/15 alcohols (e.g. Synperonic® A-types of Croda) comprising 2-20 EO units;
 - propoxy-ethoxylated alcohols, branched or linear, e.g. AntaroX® B/848 of Solvay, Atlas® G5000 of Croda, Lucramul® HOT 5902 of Levaco;
 - propoxy-ethoxylated fatty acids, Me end-capped, e.g. Leofat® OC0503M of Lion;
- 10
- alkyl ether citrate surfactants (e.g. Adsee CE range, Akzo Nobel);
 - alkylpolysaccharides (e.g. Agnique® PG8107, PG8105 of BASF; Atplus® 438, AL-2559, AL-2575 of Croda);
 - ethoxylated mono- or diesters of glycerine comprising fatty acids with 8-18 carbon atoms and an average of 10-40 EO units (e.g. Crovol® product range of Croda);
- 15
- castor oil ethoxylates comprising an average of 5-40 EO units (e.g. Berol® range of Nouryon, Emulsogen® EL range of Clariant);
 - ethoxylated oleic acid (e.g. Alkamuls® A and AP) comprising 2-20 EO units;
 - ethoxylated sorbitan fatty acid esters comprising fatty acids with 8-18 carbon atoms and an average of 10-50 EO units (e.g. Arlatone® T, Tween range).

20 Rain-fast additives e)

Suitable rain-fast additives are acrylic based emulsion polymers or polymer dispersions and styrene based emulsion polymers or polymer dispersions d) are aqueous polymer dispersions with a T_g in the range from -100°C to 30°C, preferably between -60°C and 20°C, more preferably between -50°C and 10°C, most preferably between -45°C and 5°C, for example Acronal V215, Acronal 3612, Licomer ADH 205 and Atplus FA. Particularly preferred are Licomer ADH205, and Atplus FA.

25

Preferably, the polymer is selected from the group consisting of acrylic polymers, styrene polymers, vinyl polymers and derivatives thereof, polyolefins, polyurethanes and natural polymers and derivatives thereof.

More preferably, the polymer is selected from the group consisting of acrylic polymers, styrene butadiene copolymers, styrene-maleic anhydride copolymers, polyvinyl alcohol, polyvinyl acetate, partially hydrolysed polyvinyl acetate, methyl vinyl ether-maleic anhydride copolymers, carboxy-modified polyvinyl alcohol, acetoacetyl-modified polyvinyl alcohol, diacetone-modified polyvinyl alcohol and
5 silicon-modified polyvinyl alcohol, isopropylene-maleic anhydride copolymer, polyurethane, cellulose, gelatine, caesin, oxidised starch, starch-vinyl acetate graft copolymers, hydroxyethyl cellulose, methyl cellulose, ethyl cellulose, carboxymethyl cellulose and acetyl cellulose.

Most preferably the polymer is selected from copolymers of an acrylate and a styrene, wherein . Said acrylate selected from the list comprising 2-ethyl-hexyl acrylate, butyl acrylate, sec-butyl acrylate, ethyl
10 acrylate, methyl acrylate, acrylic acid, acrylamide, iso-butyl acrylate, methyl methacrylate, or combinations thereof. Said styrene selected from the list comprising styrene, tert-butyl styrene, para-methyl styrene, or combinations thereof.

In a preferred embodiment the polymer, as described above, has a molecular weight of no more than 40000, preferably no more than 10000.

15 In a preferred embodiment the polymer D is an emulsion polymer as described in WO 2017/202684.

The glass transition temperature (Tg) is known for many polymers and is determined in the present invention, if not defined otherwise, according to ASTM E1356-08 (2014) "Standard Test Method for Assignment of the Glass Transition Temperatures by Differential Scanning Calorimetry" wherein the sample is dried prior to DSC at 110°C for one hour to eliminate effect of water and/or solvent, DSC sample
20 size of 10-15 mg, measured from -100°C to 100°C at 20°C/min under N₂, with Tg defined as midpoint of the transition region.

Other formulants f)

f1 Suitable non-ionic surfactants or dispersing aids f1) are all substances of this type which can customarily be employed in agrochemical agents. Preferably, polyethylene oxide-polypropylene oxide
25 block copolymers, preferably having a molecular weight of more than 6,000 g/mol or a polyethylene oxide content of more than 45%, more preferably having a molecular weight of more than 6,000 g/mol and a polyethylene oxide content of more than 45 %, polyoxyalkylenamine derivatives, polyvinylpyrrolidone, copolymers of polyvinyl alcohol and polyvinylpyrrolidone, and copolymers of (meth)acrylic acid and (meth)acrylic acid esters. Out of the examples mentioned above selected classes can be optionally
30 phosphated, sulphonated or sulphated and neutralized with bases.

Possible anionic surfactants f1) are all substances of this type which can customarily be employed in agrochemical agents. Alkali metal, alkaline earth metal and ammonium salts of alkylsulphonic or alkylphosphoric acids as well as alkylarylsulphonic or alkylarylphosphoric acids are preferred. A further

preferred group of anionic surfactants or dispersing aids are alkali metal, alkaline earth metal and ammonium salts of polystyrenesulphonic acids, salts of polyvinylsulphonic acids, salts of alkylnaphthalene sulphonic acids, salts of naphthalene-sulphonic acid-formaldehyde condensation products, salts of condensation products of naphthalenesulphonic acid, phenolsulphonic acid and formaldehyde, and salts of lignosulphonic acid.

f2 A rheological modifier is an additive that when added to the recipe at a concentration that reduces the gravitational separation of the dispersed active ingredient during storage results in a substantial increase in the viscosity at low shear rates. Low shear rates are defined as 0.1 s⁻¹ and below and a substantial increase as greater than x2 for the purpose of this invention. The viscosity can be measured by a rotational shear rheometer.

Suitable rheological modifiers E2) by way of example are:

- Polysaccharides including xanthan gum, and hydroxyethyl cellulose. Examples are Kelzan®, Rhodopol® G and 23, Satiaxane® CX911 and Natrosol® 250 range.
- Clays including montmorillonite, bentonite, sepiolite, attapulgitite, laponite, hectorite. Examples are Veegum® R, Van Gel® B, Bentone® 34, 38, CT, HC, EW, Pangel® M100, M200, M300, S, M, W, Attagel® 50, Laponite® RD,
- Fumed and precipitated silica, examples are Aerosil® 200, Sipernat® 22.

Preferred are xanthan gum, montmorillonite clays, bentonite clays and fumed silica.

f3 Suitable antifoam substances e3) are all substances which can customarily be employed in agrochemical agents for this purpose. Silicone oils, silicone oil preparations are preferred. Examples are Silcolapse® 426 and 432 from Bluestar Silicones, Silfoam® SRE and SC132 from Wacker, SAF-184® from Silchem, Foam-Clear ArraPro-S® from Basildon Chemical Company Ltd, SAG® 1572 and SAG® 30 from Momentive [Dimethyl siloxanes and silicones, CAS No. 63148-62-9]. Preferred is SAG® 1572.

f4 Suitable antifreeze agents are all substances which can customarily be employed in agrochemical agents for this purpose. Suitable examples are propylene glycol, ethylene glycol, urea and glycerine.

f5 Suitable other formulants e5) are selected from biocides, colourants, pH adjusters, buffers, stabilisers, antioxidants, inert filling materials, humectants, crystal growth inhibitors, micronutrients by way of example are:

Possible preservatives are all substances which can customarily be employed in agrochemical agents for this purpose. Suitable examples for preservatives are preparations containing 5-chloro-2-methyl-4-isothiazolin-3-one [CAS-No. 26172-55-4], 2-methyl-4-isothiazolin-3-one [CAS-No. 2682-20-4] or 1.2-

benzothiazol-3(2H)-one [CAS-No. 2634-33-5]. Examples which may be mentioned are Preventol® D7 (Lanxess), Kathon® CG/ICP (Dow), Acticide® SPX (Thor GmbH) and Proxel® GXL (Arch Chemicals).

Possible colourants are all substances which can customarily be employed in agrochemical agents for this purpose. Titanium dioxide, carbon black, zinc oxide, blue pigments, Brilliant Blue FCF, red pigments and
5 Permanent Red FGR may be mentioned by way of example.

Possible pH adjusters and buffers are all substances which can customarily be employed in agrochemical agents for this purpose. Citric acid, sulfuric acid, hydrochloric acid, sodium hydroxide, sodium hydrogen phosphate (Na_2HPO_4), sodium dihydrogen phosphate (NaH_2PO_4), potassium dihydrogen phosphate (KH_2PO_4), potassium hydrogen phosphate (K_2HPO_4), may be mentioned by way of example.

10 Suitable stabilisers and antioxidants are all substances which can customarily be employed in agrochemical agents for this purpose. Butylhydroxytoluene [3,5-Di-tert-butyl-4-hydroxytoluol, CAS-No. 128-37-0] is preferred.

Carriers (g) are those which can customarily be used for this purpose in agrochemical formulations.

A carrier is a solid or liquid, natural or synthetic, organic or inorganic substance that is generally inert,
15 and which may be used as a solvent. The carrier generally improves the application of the compounds, for instance, to plants, plants parts or seeds. Examples of suitable

solid carriers include, but are not limited to, ammonium salts, in particular ammonium sulfates, ammonium phosphates and ammonium nitrates, natural rock flours, such as kaolins, clays, talc, chalk, quartz, attapulgite, montmorillonite and diatomaceous earth, silica gel and synthetic rock flours, such as
20 finely divided silica, alumina and silicates. Examples of typically useful solid carriers for preparing granules include, but are not limited to crushed and fractionated natural rocks such as calcite, marble, pumice, sepiolite and dolomite, synthetic granules of inorganic and organic flours and granules of organic material such as paper, sawdust, coconut shells, maize cobs and tobacco stalks.

Preferred solid carriers are selected from clays, talc and silica.

25 Examples of suitable liquid carriers include, but are not limited to, water, organic solvents and combinations thereof. Examples of suitable solvents include polar and nonpolar organic chemical liquids, for example from the classes of

- alcohols and polyols (which may optionally also be substituted, etherified and/or esterified, such as ethanol, propanol, butanol, benzylalcohol, cyclohexanol or glycol, 2-ethyl hexanol),

30 - ethers such as dioctyl ether, tetrahydrofuran, dimethyl isosorbide, solketal, cyclopentyl methyl ether, solvents offered by Dow under the Dowanol Product Range e.g. Dowanol DPM, anisole, phenetole,

different molecular weight grades of dimethyl polyethylene glycol, different molecular weight grades of dimethyl polypropylene glycol, dibenzyl ether

- ketones (such as acetone, methyl ethyl ketone, methyl isobutyl ketone, cyclopentanone, cyclohexanone, cycloheptanone, acetophenone, propiophenone),
- 5
- lactate esters, such as methyl lactate, ethyl lactate, propyl lactate, butyl lactate, 2-ethyl hexyl lactate
 - (poly)ethers such as different molecular weight grades of polyethylene glycol, different molecular weight grades of polypropylene glycol
 - unsubstituted and substituted amines
- 10
- amides (such as dimethylformamide, or N,N-dimethyl lactamide, or N-formyl morpholine, or fatty acid amides such N,N-dimethyl decanamide or N,N-dimethyl dec-9-en-amide) and esters thereof
 - lactams (such as 2-pyrrolidone, or N-alkylpyrrolidones, such as N-methylpyrrolidone, or N-butylpyrrolidone, or N-octylpyrrolidone, or N-dodecylpyrrolidone or N-methyl caprolactam, N-alkyl caprolactam)
- 15
- lactones (such as gamma-butyrolactone, gamma-valerolactone, delta-valerolactone, or alpha-methyl gamma-butyrolactone
 - sulfones and sulfoxides (such as dimethyl sulfoxide),
 - nitriles, such as linear or cyclic alkyl nitriles, in particular acetonitrile, cyclohexane carbonitrile, octanonitrile, dodecanonitrile).
- 20
- linear and cyclic carbonates, such as diethyl carbonate, dipropyl carbonate, dibutyl carbonate, dioctyl carbonate, or ethylene carbonate, propylene carbonate, butylene carbonate, glycerine carbonate

Most preferred the carrier is water.

These spray liquids are applied by customary methods, i.e., for example, by spraying, pouring or injecting, in particular by spraying, and most particular by spraying by UAV.

A. Methods and Abbreviations

A-1. Methods

All data which are part of the present application have been prepared according to the methods described below unless otherwise indicated. The samples used for measurement were directly used and did not
5 undergo any further sample preparation.

Measurement of LogP values

Measurement of LogP values as provided herein was performed according to EEC directive 79/831 Annex V.A8 by HPLC (High Performance Liquid Chromatography) on reversed phase columns with method determined by measurement of LC-UV, in an acidic range, with 0.1 % formic acid in water and acetonitrile
10 as eluent (linear gradient from 10 % acetonitrile to 95 % acetonitrile).

Calibration was done with straight-chain alkan-2-ones (with 3 to 16 carbon atoms) with known LogP values (measurement of LogP values using retention times with linear interpolation between successive alkanones). Lambda-max-values were determined using UV-spectra from 200 nm to 400 nm and the peak values of the chromatographic signals

15 ¹H-NMR data

¹H-NMR data of selected examples as provided herein are written in form of ¹H-NMR-peak lists. To each signal peak are listed the d-value in ppm and the signal intensity in round brackets. Between the d-value – signal intensity pairs are semicolons as delimiters.

The peak list of an example has therefore the form:

20 d 1 (intensity 1); d 2 (intensity 2);.....; d i (intensity i);.....; d n (intensity n)

Intensity of sharp signals correlates with the height of the signals in a printed example of a NMR spectrum in cm and shows the real relations of signal intensities. From broad signals several peaks or the middle of the signal and their relative intensity in comparison to the most intensive signal in the spectrum can be shown.

25 For calibrating chemical shift for ¹H spectra, we use tetramethylsilane and/or the chemical shift of the solvent used, especially in the case of spectra measured in DMSO. Therefore in NMR peak lists, tetramethylsilane peak can occur but not necessarily.

The ¹H-NMR peak lists are similar to classical ¹H-NMR prints and contains therefore usually all peaks, which are listed at classical NMR-interpretation.

Additionally they can show like classical ¹H-NMR prints signals of solvents, stereoisomers of the target compounds, which are also object of the invention, and/or peaks of impurities.

To show compound signals in the delta-range of solvents and/or water the usual peaks of solvents, for example peaks of DMSO in DMSO-D₆ and the peak of water are shown in our ¹H-NMR peak lists and
5 have usually on average a high intensity .

The peaks of stereoisomers of the target compounds and/or peaks of impurities have usually on average a lower intensity than the peaks of target compounds (for example with a purity > 90 %).

Such stereoisomers and/or impurities can be typical for the specific preparation process. Therefore their peaks can help to recognize the reproduction of our preparation process via “side-products-fingerprints”.

10 An expert, who calculates the peaks of the target compounds with known methods (MestreC, ACD-simulation, but also with empirically evaluated expectation values) can isolate the peaks of the target compounds as needed optionally using additional intensity filters. This isolation would be similar to relevant peak picking at classical ¹H-NMR interpretation.

Further details of NMR-data description with peak lists you find in the publication “Citation of NMR
15 Peaklist Data within Patent Applications” of the Research Disclosure Database Number 564025.

Separation of enantiomers

Enantiomeric separations of racemates are performed by preparative supercritical fluid chromatography using supercritical carbon dioxide as mobile phase and lower alcohols as modifier, more preferably methanol, ethanol or isopropanol in a ratio comprised between 15 and 30 % by volume. Total flow rates
20 are in a range 70 - 100 ml/min and chromatographic separations are done at a temperature in a range of between 30°C and 50°C and a back pressure in a range of between 70 bar to 130 bar on one of the thermostated chiral stationary phases, commercially available and known as follows :

- ChiralPak ® IA, 250x20mm from Daicel Chemical Industries, Ltd.
- Lux ® Amylose-1, 250x21.2mm 5µm, Axia packed from Phenomenex Inc.
- 25 - Lux ® Cellulose-1, 250x21.2mm 5µm, Axia packed from Phenomenex Inc.
- Lux ® i-Cellulose-5, 250x21.2mm 5µm, Axia packed from Phenomenex Inc.

XRPD

X-Ray diffraction patterns were recorded at room temperature using XRD-diffractometers X`Pert PRO (PANalytical) and STOE STADI-P (radiation Cu K alpha 1, wavelength 1.5406 Å). All X-Ray reflections
30 are quoted as °2θ (theta) values (peak maxima) with a resolution of ± 0.2°.

Raman

Raman spectra were recorded at room temperature using FT-Raman-spectrophotometers (model MultiRam) from Bruker. Resolution was 2 cm^{-1} . Measurements were performed in glass vials or aluminium discs.

IR

- 5 IR-ATR-spectra were recorded at room temperature using a FT-IR-spectrophotometer Tensor 37 or Alpha with universal diamond ATR device from Bruker. Resolution was 2 cm^{-1} .

TGA

- 10 TGA thermograms were recorded using thermobalances (model TGA 8000) from Perkin-Elmer and (model TGA/DSC 3+) from Mettler Toledo The measurements were performed with a heating rate of 10 Kmin^{-1} using open platinum pans (Perkin Elmer) and perforated aluminium pans (Mettler). Flow gas was nitrogen.

B. Examples**B-1. Synthetic Preparation**

Preparation of example 1: (5S)-3-[3-(3-chloro-2-fluorophenoxy)-6-methylpyridazin-4-yl]-5-(2-chloro-4-methylbenzyl)-5,6-dihydro-4H-1,2,4-oxadiazine (I) [2446130-20-5]

- 5 Step 1: preparation of N-[(2RS)-1-chloro-3-(2-chloro-4-methylphenyl)propan-2-yl]-3-(3-chloro-2-fluorophenoxy)-6-methylpyridazine-4-carboxamide [2446133-45-3]

Under argon, 3-(3-chloro-2-fluoro-phenoxy)-6-methyl-pyridazine-4-carboxylic acid [2435607-79-5] (175 g, 619 mmol) and (2RS)-1-chloro-3-(2-chloro-4-methylphenyl)propan-2-amine hydrochloride (1:1) [2446132-78-9] (262 g, 928 mmol) were suspended in 3 L dichloromethane, then propanephosphonic anhydride (682 mL, 2290 mmol) was slowly added over 10 min N,N-Diisopropylethylamine (393 mL, 2250 mmol) was added dropwise and the reaction was stirred at room temperature for 18 hours. Afterwards the reaction mixture was poured into a 1.5 L saturated aqueous sodium bicarbonate solution and 1 L of water was added. The mixture was extracted two times with 500 ml of dichloromethane. The combined organic layers were dried with sodium sulfate, filtered and evaporated. The product was purified
10 by column chromatography on 3 kg silica gel column (solid deposit) with elution gradient heptane/ethyl acetate 100/0 to 0/100. After evaporation of the solvents, 250 g (100 % purity, 83 % yield) of the title compound were recovered as a solid.

Step 2: preparation of N-[(2RS)-1-chloro-3-(2-chloro-4-methylphenyl)propan-2-yl]-3-(3-chloro-2-fluorophenoxy)-N'-hydroxy-6-methylpyridazine-4-carboximidamide [2446133-13-5]

- 20 To a solution of N-[(2RS)-1-chloro-3-(2-chloro-4-methylphenyl)propan-2-yl]-3-(3-chloro-2-fluorophenoxy)-6-methylpyridazine-4-carboxamide [2446133-45-3] (249 g, 515 mmol) in toluene (3 L) was added phosphorous pentachloride (215 g, 1030 mmol). The reaction mixture was stirred at 75°C for 1 h, then concentrated under reduced pressure. The residue was dissolved in 1,4-dioxane (1.2 L) and a solution of hydroxylamine (681 g, 10.3 mol, 50% in water) diluted in 1,4-dioxane (2.8 L) at 15°C was added to the
25 reaction mixture over 30 min.. After stirring at room temperature for 16 h the reaction mixture was diluted with water (6 L) followed by a slow addition of 1.6 L of hydrochloric acid 6M. The aqueous phase was extracted with ethyl acetate (4 x 750 mL). The organic extracts were washed with brine (1 L), dried over sodium sulfate, filtered and concentrated under reduced pressure. Evaporation of the solvents afforded 309 g (80 % purity, 96 % yield) of the title product as a yellow oil.

- 30 Step 3: preparation of (5RS)-3-[3-(3-chloro-2-fluorophenoxy)-6-methylpyridazin-4-yl]-5-(2-chloro-4-methylbenzyl)-5,6-dihydro-4H-1,2,4-oxadiazine [2446129-82-2]

To a solution of N-[(2RS)-1-chloro-3-(2-chloro-4-methylphenyl)propan-2-yl]-3-(3-chloro-2-fluorophenoxy)-N'-hydroxy-6-methylpyridazine-4-carboximidamide [2446133-13-5] (278 g, 474 mmol) in acetonitrile (5 L) and water (50 mL) was added potassium tert-butoxide (173 g, 830 mmol). The reaction mixture was stirred at 45°C for 45 min.. The reaction mixture was diluted with water (1 L) and acetonitrile was evaporated under vacuum. The resulting mixture was diluted with water (8 L) and extracted with ethyl acetate (3 x 1.5 L). The combined organic layers were washed with of brine (2 x 1 L), dried over magnesium sulfate, filtered and concentrated. The residue was first purified by column chromatography on 3 kg silica gel column (solid deposit) with elution gradient dichloromethane 100 to dichloromethane/ethyl acetate 70/30, then purified a second time by column chromatography on 1.5 kg silica gel column solid deposit, with a gradient heptane 100 to ethyl acetate 100. Collected fractions were concentrated to give an orange sticky solid. The solid was triturated in 500 ml of heptane at 50°C during 2 hours then filtered to afford 115 g (99 % purity, 50 % yield) the title compound.

Separation of Enantiomers

The separations on preparative scale were performed on apparatus SFC-PICLAB Hybrid 10-150 from Pic Solution with UV-detection in a range of between 210nm and 280nm, preferably 220 and 254nm.

(5RS)-3-[3-(3-chloro-2-fluorophenoxy)-6-methylpyridazin-4-yl]-5-(2-chloro-4-methylbenzyl)-5,6-dihydro-4H-1,2,4-oxadiazine (mixture of diastereomers) (17 g, 99 % purity) was separated by preparative supercritical fluid chromatography to yield (5R)-3-[3-(3-chloro-2-fluorophenoxy)-6-methylpyridazin-4-yl]-5-(2-chloro-4-methylbenzyl)-5,6-dihydro-4H-1,2,4-oxadiazine (8.71 g, 100 % purity) and (5S)-3-[3-(3-chloro-2-fluorophenoxy)-6-methylpyridazin-4-yl]-5-(2-chloro-4-methylbenzyl)-5,6-dihydro-4H-1,2,4-oxadiazine (I) (8.77 g, 100 % purity).

Column: ChiralPak ® IA, 250x20mm.; Eluent A: CO₂; Eluent B: methanol; isocratic 25%

Analytical chiral HPLC. Column ChiralPak ® IB N-5 150x2,1 5 µm; Eluent A: water + 0.1 % HCOOH; Eluent B: acetonitrile + 0.1 % HCOOH; isocratic 45:55 A/B; flow: 0.175 ml/min; UV: 220 nm; oven: 25°C

(5R)-3-[3-(3-chloro-2-fluorophenoxy)-6-methylpyridazin-4-yl]-5-(2-chloro-4-methylbenzyl)-5,6-dihydro-4H-1,2,4-oxadiazine: $R_t = 12.33$ min; Optical rotation: +79.7° (c=1.21, CDCl₃, 25°C) concentration c is expressed in g/100 mL

(5S)-3-[3-(3-chloro-2-fluorophenoxy)-6-methylpyridazin-4-yl]-5-(2-chloro-4-methylbenzyl)-5,6-dihydro-4H-1,2,4-oxadiazine (I): $R_t = 13.09$ min; Optical rotation: -81.4° (c=1.16, CDCl₃, 25°C) concentration c is expressed in g/100 mL

LogP: 3.88

¹H-NMR (600.2 MHz, CDCl₃):

δ= 7.9188 (5.3); 7.3551 (0.6); 7.3490 (0.7); 7.3445 (1.1); 7.3389 (1.2); 7.3333 (0.7); 7.3280 (0.7); 7.2619 (5.8); 7.1515 (3.6); 7.1452 (2.0); 7.1397 (2.8); 7.1100 (2.3); 7.1090 (2.3); 7.0607 (2.1); 7.0479 (2.3); 6.7461 (1.2); 6.7449 (1.2); 6.7334 (1.1); 6.7322 (1.1); 6.0010 (1.2); 4.2055 (1.0); 4.1999 (1.1); 4.1873 (1.2); 4.1817 (1.2); 4.0168 (0.4); 4.0118 (0.5); 4.0075 (0.6); 4.0045 (0.6); 4.0016 (0.6); 3.9973 (0.6); 3.9923 (0.4); 3.8732 (1.3); 3.8641 (1.2); 3.8550 (1.2); 3.8459 (1.1); 3.1400 (0.9); 3.1316 (0.9); 3.1175 (1.0); 3.1091 (1.0); 2.8832 (1.1); 2.8676 (1.1); 2.8608 (1.0); 2.8452 (0.9); 2.6415 (16.0); 2.1863 (11.5); 1.5862 (2.0); 0.0000 (7.7)

B-2. Polymorphic form B of (5S)-3-[3-(3-chloro-2-fluorophenoxy)-6-methylpyridazin-4-yl]-5-(2-chloro-4-methylbenzyl)-5,6-dihydro-4H-1,2,4-oxadiazine

B-2-1. Preparation of polymorphic form B

Compound of formula (I) was dissolved in the respective solvent (given in Table 5) at the respective boiling temperature. The solutions were filtered, divided into four, three or two portions (depending on the solvent used, if any). The different portions were each stored

- 15 a) at room temperature
 b) in a refrigerator (4°C to 7°C)
 c) in a freezer (-20°C to -18°C)

until dryness,

- d) optionally, an antisolvent was added.

20 **Table 5:** Solvents used for crystallizing form B

No.	Solvent	Volume [ml]	Amount API [mg]	a)	b)	c)	d)
4	Toluene	60	416	x	x	x	-
5	Tetrahydrofuran	40	411	x	x	x	90 ml H ₂ O
6	Acetone	40	418	x	x	x	40 ml H ₂ O
7	Ethyl acetate	80	412	x	x	x	-
8	Acetonitrile	80	411	x	x	x	130 ml H ₂ O
9	Isopropanol	60	407	x	x	x	85 ml H ₂ O
10	Ethanol	80	408	x	x	x	130 ml H ₂ O

No.	Solvent	Volume [ml]	Amount API [mg]	a)	b)	c)	d)
11	Ethanol/water (1 : 1)	40	206	x	x	-	90 ml H ₂ O
12	Methanol	80	413	x	x	x	130 ml H ₂ O
14	Dimethylformamide	10	213	x	-	-	40 ml H ₂ O
15	1,4-Dioxane	30	316	x	x	-	90 ml H ₂ O
16	Dimethylsulfoxide	10	200	-	-	-	40 ml H ₂ O

The examples 4 to 16 in table 5 yielded polymorphic form B. The obtained crystals of polymorph B were isolated and analyzed by X-ray powder diffraction (XRPD), Raman- and IR-spectrometry.

B-3. Polymorphic form A of (5S)-3-[3-(3-chloro-2-fluorophenoxy)-6-methylpyridazin-4-yl]-5-(2-chloro-4-methylbenzyl)-5,6-dihydro-4H-1,2,4-oxadiazine

5 **B-3-1. Preparation of polymorphic form A**

Process for the production of polymorphic form A

To obtain crystals of polymorphic form A, a temperature-depending X-ray powder diffraction (XRPD) experiment was performed, in which recrystallization was allowed at different temperatures. A phase changed was observed at 60°C on heating and at 40°C on cooling. The X-ray diffraction pattern of polymorphic form A was observed at 75°C.

10

The obtained crystals of polymorph A were isolated and analyzed by X-ray powder diffraction (XRPD).

C. Properties of polymorphic form B of (5S)-3-[3-(3-chloro-2-fluorophenoxy)-6-methylpyridazin-4-yl]-5-(2-chloro-4-methylbenzyl)-5,6-dihydro-4H-1,2,4-oxadiazine of formula (I)

C-1. Formulation Examples

A formulation of the compound of formula (I) in the polymorphic form B was prepared as a suspension concentrate (SC) formulation according to the recipe in Table 6. The formulation was produced by first preparing a 2 % gel of Rhodopol 23 in water with the biocides. The remaining components were mixed with stirring in the following order: water, antifreeze, antifoam and dispersants until dissolved, then the powder of the polymorphic form B of the compound of formula (I) was added, dispersed by mixing and ground in a bead mill to give a particle size of 1 to 10 microns (Dv50). To the ground dispersion the 2 % Rhodopol 23 gel was added with low shear mixing to produce the SC formulation. The formulation was then subjected to stability tests by storing samples at 70°C and 80°C.

Table 6: SC formulation recipe 1

Component	g/l	Function	Supplier	CAS No.
Polymorph B	100	active ingredient		
Atlox® 4913	30.2	dispersant	Croda	119724-54-8
Lucramul® PS 54	9.7	dispersant	Levaco	104376-75-2
Silcolapse® 426R	1.1	antifoam	Bluestar Silicones	9016-00-6
Proxel® GXL	1.5	biocide	Arch Chemicals	2634-33-5
Kathon® CG/ICP	0.97	biocide	Dow	26172-55-4 plus 2682-20-4
Rhodopol® 23	4.1	rheological additive	Solvay	11138-66-2
Propylene glycol	107	antifreeze		
Water	786	carrier		

The physical aspect was determined by visual inspection of the sample, the microscopic appearance was determined by diluting the SC formulation at approximately 1 % and observing the aggregation state and size of the crystals of the polymorphic form B of the compound of formula (I) according to the invention. The dilution stability (also referred to as suspensibility) was determined by preparing 100 ml of a 1 %v/v dispersion by mixing in CIPAC C water (hardness 500 ppm) (www.cipac.org MT18.1) in graduated cylinders with a special narrow end at the bottom to visualise the volume of any sediment after 1 hour. Measurements were performed at room temperature.

Table 7: Stability of formulation recipe 1

Test	initial	1 week @70°C	5 days @80°C
microscope	dispersed particles	dispersed particles	dispersed particles
appearance	fluid suspension	fluid suspension	fluid suspension
suspensibility (1%, 1h)	trace [#]	trace [#]	trace [#]

trace[#] means that less than 0.1 mL of particles can be observed in the sample volume of 100 mL

The temperatures applied in Table 7 are much higher than used in standard procedures in which the samples are subjected to a temperature of 54°C for 2 weeks.

- 5 The results in Table 7 show no differences in the probes under the microscope, in appearance and in suspensibility after one week at 70°C and after 5 days at 80°C. In particular, regarding suspensibility the SC formulation comprising polymorphic form B of the compound of formula (I) displays only traces (less than 0.1 mL) of particles even after submitting the probes to temperatures of 70°C (for one week) and 80°C (for 5 days). These temperatures are above the transition temperature range of 49°C to 66°C. No
- 10 transition to polymorph A was observed.

These results show that polymorph B exhibits a surprisingly high stability, even when it is subjected to temperatures above the transition temperature range from polymorph B to polymorph A for several days. Thus, SC formulations comprising polymorphic form B of compound of formula (I) surprisingly are of high stability, preferably of high dilution stability, more preferably of high suspensibility, which is of

15 significant relevance since polymorph transitions are expected to cause instability in SC formulations.

C-2. Slurry Experiment

Compound of formula (I) was suspended in the respective solvent and stirred at 0°C, 40°C (Mya4 stirrer station at 250 u/min) and 80°C (Reacti-Therm III at stirring level 6) as shown in Table 8. After three to eight days, an additional amount of solvent was added to the suspensions. In two experiments additional

20 substance were added after four days. After eight days the suspensions were dried at ambient conditions. The obtained crystals were isolated and analyzed by X-ray powder diffraction (XRPD) spectrometry, DSC and TGA. Figure 3a shows XRPD after slurry experiments 3.

Table 8:

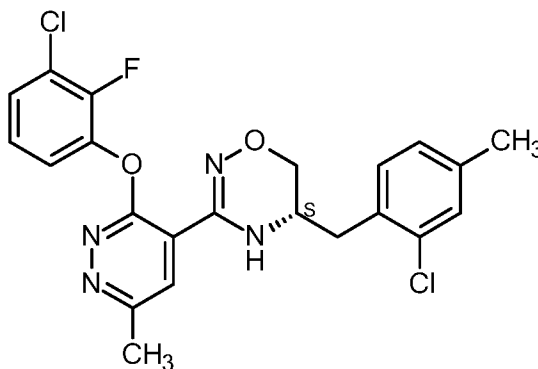
Exp. No.	amount (I) [mg]	Volume solvent [ml]	Mod. used	Solvent	T [°C]	Added volume solvent [ml]	Time [days]	Mod. obtained
1	281	2	B	CH ₃ CN	0	0.5 (4 d)	8	Mod. B
2*	287	2	B	CH ₃ CN	40	0.5 (4 d) 2 (8d)	8	Mod. B
3**	303	2	B	CH ₃ CN / water	80	2 (3 d) 3 CH ₃ CN, 2 H ₂ O (4 d)	8	Mod. B
4	268	3	B	Ethanol/ water (1 : 1)	0	0.5 (4 d)	8	Mod. B
5	266	3	B	Ethanol/ water (1 : 1)	40	0.5 (4 d)	8	Mod. B
6	303	3	B	Ethanol/ water (1 : 1)	80	3 (3 d) 1 (4 d) 0.5 (8 d)	8	Mod. B

* 83 mg were added after 4 days

** 272 mg were added after 4 days

Claims:

1. A crystalline form B of the compound of formula (I)



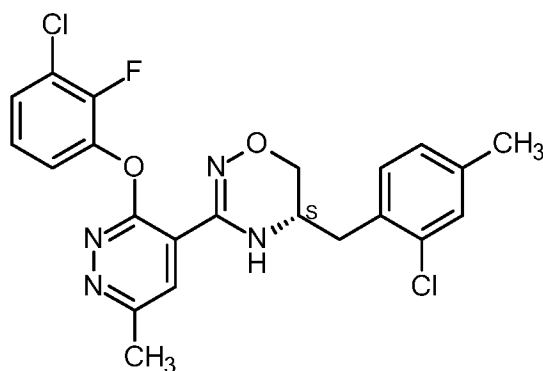
5

(I),

which in a X-ray powder diffractogram at 25°C and Cu-K α 1 radiation displays at least the following reflections, quoted as 2 Θ value \pm 0.2°: 20.2, 23.3 and 25.1.

2. The form B of the compound of claim 1, which in a X-ray powder diffractogram at 25°C and with Cu-K α 1 radiation displays at least the following reflections, quoted as 2 Θ value \pm 0.2°: 20.2, 23.3, 25.1, 14.5 and 19.4.
3. The form B of the compound of claim 1, which in a X-ray powder diffractogram at 25°C and with Cu-K α 1 radiation displays at least the following reflections, quoted as 2 Θ value \pm 0.2°: 20.2, 23.3, 25.1, 14.5, 19.4, 23.4 and 10.6.
4. The form B of the compound of formula (I) of claim 1, which in a Raman spectrum displays at least the following bands (peak maximum in cm⁻¹): 98, 112 and 1585.
5. The form B of the compound of formula (I) of claim 1, which in a Raman spectrum displays at least the following bands (peak maximum in cm⁻¹): 98, 112, 1585, 1279 and 2925 .
6. The form B of the compound of formula (I) of claim 1, which in a Raman spectrum displays at least the following bands (peak maximum in cm⁻¹): 98, 112, 1585, 1279, 2925, 688 and 1609.
7. A process for the production of crystalline form B according to any of claims 1 to 6, comprising the following steps:
- diluting the compound of formula (I) in a suitable solvent or solvent mixture,
 - heating the composition of step a) to a temperature of at least 70°C, and

- c) cooling the solution from step b) to a temperature of less than 20°C.
8. Composition comprising polymorphic form B according to any one of claims 1 to 6.
9. Composition according to claim 8, wherein the composition comprises at least a) one or more drift reducing ingredients, b) one or more spreading agents, c) one or more uptake enhancing agents, d) one or more rain-fast additives, e) optional other formulants and/or f) one or more carriers to volume.
10. Composition according to claim 8 or 9, wherein the composition is a suspension concentrate formulation.
11. A plant protection agent comprising the crystalline form B of formula (I) according to any of claims 1 to 6 or the composition according to any one claims 8 to 10.
12. The plant protection agent according to claim 11, which further comprises one or more additional active substance(s) selected from the group consisting of herbicides, insecticides, acaricides, fungicides, safeners and/or plant growth regulators.
13. Use of the polymorphic form B according to any of claims 1 to 6 for the production of a composition or a plant protection agent, preferably with high stability, more preferably with high stability at temperatures above the transition temperature.
14. Use of the polymorphic form B according to any of claims 1 to 6, or of a formulation according to any of claims 8 to 10 or of a plant protection agent according to claim 11 or 12 for controlling unwanted microorganisms.
15. Method for controlling unwanted microorganisms, wherein the polymorphic form B according to any of claims 1 to 6, a formulation according to any one of claims 8 to 10 or a plant protection agent according to claim 11 or 12 is applied to useful plants.
16. A crystalline form A of the compound of formula (I)



(I),

which in a X-ray powder diffractogram at 25°C and Cu-K α 1 radiation displays at least the following reflections, quoted as 2 Θ value \pm 0.2°: 16.9, 19.8 and 24.5.

17. The form A of the compound of claim 16, which in a X-ray powder diffractogram at 25°C and with Cu-K α 1 radiation displays at least the following reflections, quoted as 2 Θ value \pm 0.2°: 16.9, 19.8, 24.5, 14.2 and 24.7.
- 5
18. The form A of the compound of claim 16, which in a X-ray powder diffractogram at 25°C and with a Cu-K α 1 radiation displays at least the following reflections, quoted as 2 Θ value \pm 0.2°: 16.9, 19.8, 24.5, 14.2, 24.7, 20.8 and 21.8.

Fig. 1a: X-ray powder diffractogram of polymorphic form B of (5S)-3-[3-(3-chloro-2-fluorophenoxy)-6-methylpyridazin-4-yl]-5-(2-chloro-4-methylbenzyl)-5,6-dihydro-4H-1,2,4-oxadiazine

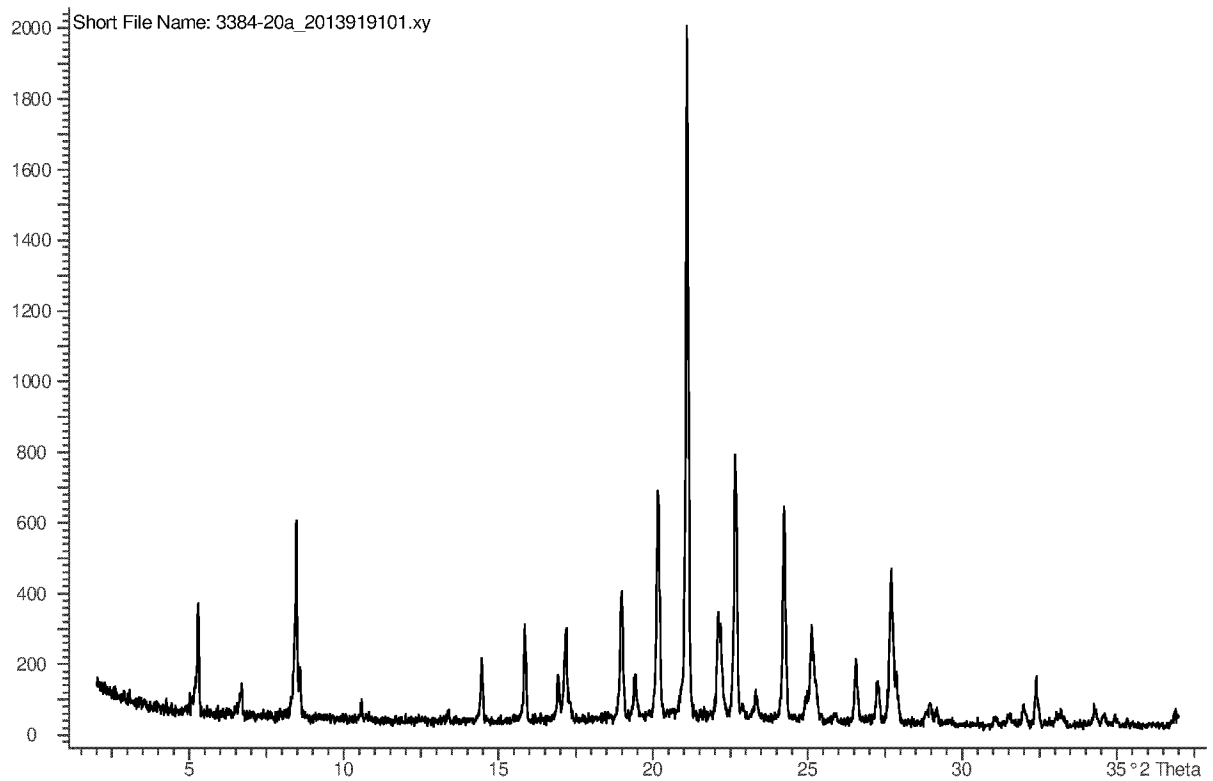


Fig. 1b: FT Raman spectrum of polymorphic form B of (5S)-3-[3-(3-chloro-2-fluorophenoxy)-6-methylpyridazin-4-yl]-5-(2-chloro-4-methylbenzyl)-5,6-dihydro-4H-1,2,4-oxadiazine

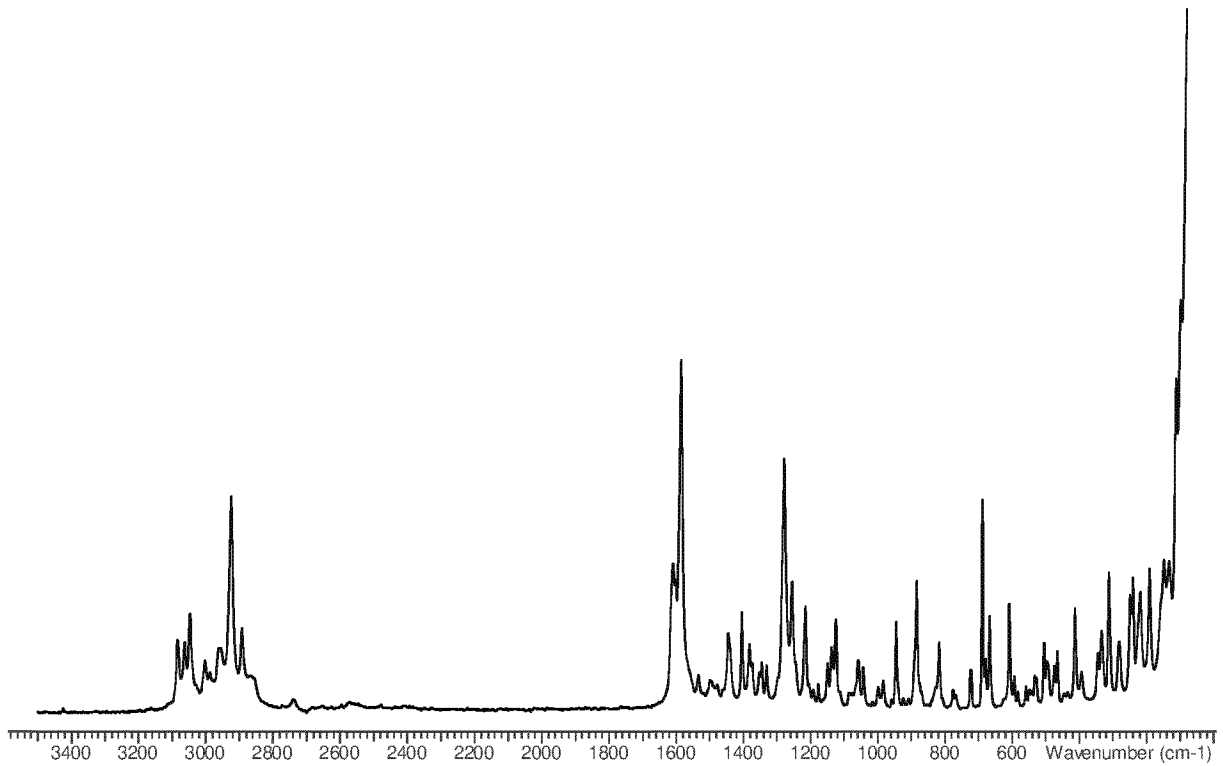


Fig. 1c: IR spectrum of polymorphic form B of (5S)-3-[3-(3-chloro-2-fluorophenoxy)-6-methylpyridazin-4-yl]-5-(2-chloro-4-methylbenzyl)-5,6-dihydro-4H-1,2,4-oxadiazine

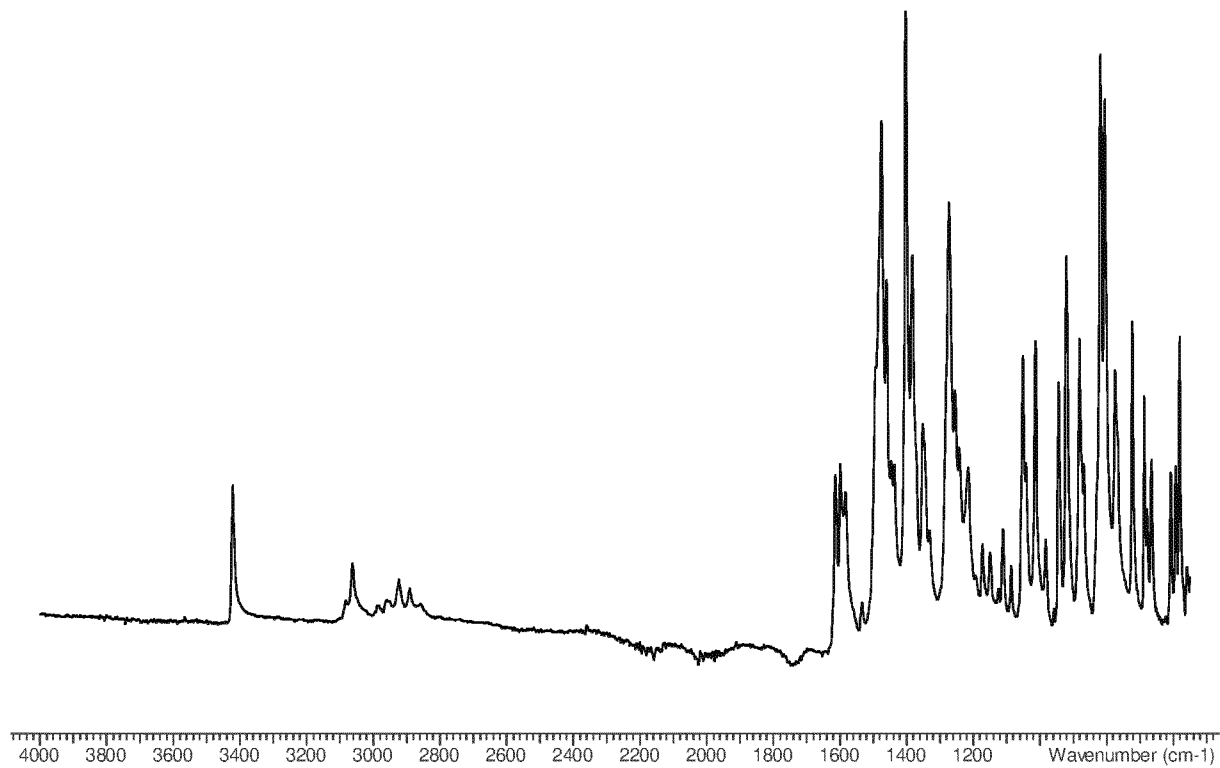


Fig. 2a: X-ray powder diffractogram of polymorphic form A of (5S)-3-[3-(3-chloro-2-fluorophenoxy)-6-methylpyridazin-4-yl]-5-(2-chloro-4-methylbenzyl)-5,6-dihydro-4H-1,2,4-oxadiazine

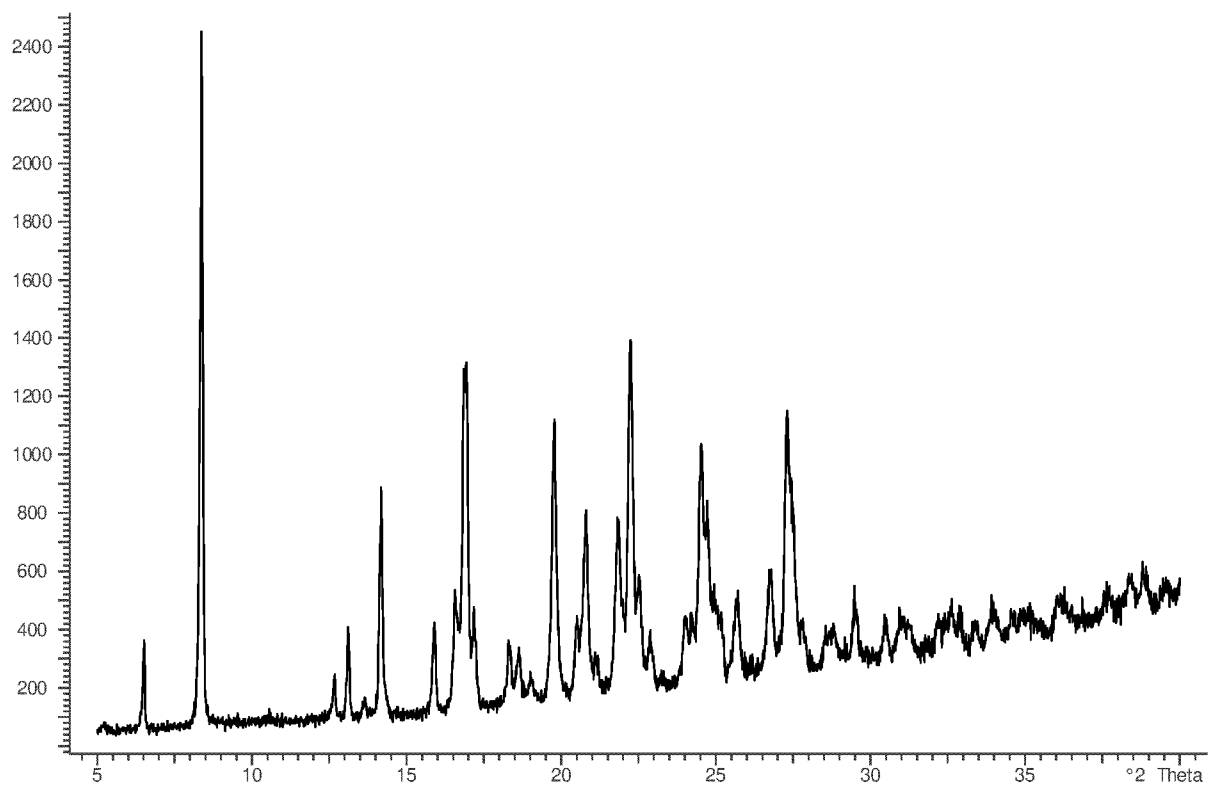
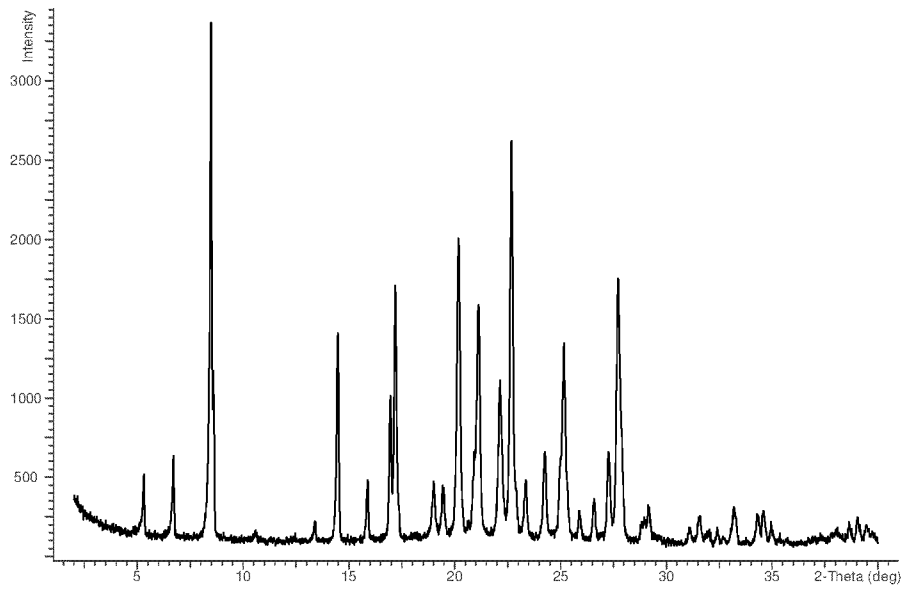


Fig 3a: X-ray powder diffractogram after slurry experiment 3 (8 d/80°C CH₃CN/H₂O)

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2023/061071

A. CLASSIFICATION OF SUBJECT MATTER
INV. C07D413/04 A01N31/00
ADD.

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
C07D A01N

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

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2020/127780 A1 (BAYER AG [DE]) 25 June 2020 (2020-06-25) claims 1-16; table 1; compounds I-338, I-339	1-18
X	----- WO 2021/255070 A1 (BAYER AG [DE]) 23 December 2021 (2021-12-23) compounds I-338, I-339 ----- -/--	1-18

Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents :

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

Date of the actual completion of the international search 2 June 2023	Date of mailing of the international search report 14/06/2023
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Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer Sáez Díaz, R
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INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2023/061071

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>MINO R CAIRA ED - MONTCHAMP JEAN-LUC: "CRYSTALLINE POLYMORPHISM OF ORGANIC COMPOUNDS", TOPICS IN CURRENT CHEMISTRY; [TOPICS IN CURRENT CHEMISTRY], SPRINGER, BERLIN, DE, vol. 198, 1 January 1998 (1998-01-01), pages 163-208, XP001156954, ISSN: 0340-1022, DOI: 10.1007/3-540-69178-2_5 [retrieved on 1999-02-26] chapter 3.1; page 165 - page 166 -----</p>	1-18

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2023/061071

Patent document cited in search report	Publication date	Patent family member(s)	Publication date			
WO 2020127780	A1	25-06-2020	AR 117461 A1	04-08-2021		
			CA 3124013 A1	25-06-2020		
			CL 2021001661 A1	03-12-2021		
			CN 113454079 A	28-09-2021		
			CO 2021007995 A2	30-06-2021		
			EA 202191668 A1	10-11-2021		
			EC SP21044312 A	30-07-2021		
			EP 3898620 A1	27-10-2021		
			JP 2022514651 A	14-02-2022		
			KR 20210106492 A	30-08-2021		
			TW 202039468 A	01-11-2020		
			US 2023064576 A1	02-03-2023		
			UY 38524 A	31-07-2020		
			WO 2020127780 A1	25-06-2020		

WO 2021255070	A1	23-12-2021	AR 122692 A1	28-09-2022		
			AU 2021291371 A1	02-02-2023		
			BR 112022024409 A2	07-02-2023		
			CA 3187297 A1	23-12-2021		
			CL 2022003615 A1	28-04-2023		
			CN 115955916 A	11-04-2023		
			CO 2022018291 A2	20-12-2022		
			EP 4167740 A1	26-04-2023		
			KR 20230038704 A	21-03-2023		
			WO 2021255070 A1	23-12-2021		
