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(54) Title: METHOD FOR TREATING RICE SEED

(57) Abstract: This invention provides a method for preparing a coated rice seed wherein a seed coating is at least partially applied to the surface of dry rice seed, characterized in that the seed coating comprises at least an ethylene-vinylacetate copolymer and at least one agrochemical. The invention further provides a coated rice seed and a method for protecting emerging seedlings of rice plants against fungal diseases and/ or pests before planting.



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Method for Treating Rice Seed

The present invention relates to a method for preparing a coated rice seed wherein a seed coating is at least partially applied to the surface of dry rice seed, a coated rice seed and a method for protecting emerging seedlings of rice plants against fungal diseases and/ or pests before planting.

- 5 Disease preventive treatments for transplanted rice and/or for controlling animal pests are known, in which agrochemicals are sprayed, or granules applied, to rice paddies or nursery boxes. However, this use of agrochemicals over rice paddies for preventing diseases of rice and/or for controlling animal pests after transplantation to rice paddies has problems such that large amounts of agrochemicals are needed or the effect of agrochemicals does not last long. Even if the amount of agrochemicals can be reduced
10 when spraying or applying granular agrochemicals to nursery boxes compared with that in rice paddies, in some cases the amount of agrochemicals used is still large and the durability of the effect is not sufficient.

- Rice seed may be soaked and incubated before sowing. In order to protect the rice seed, pesticides, in particular fungicides, may be added to the soaking water or directly to the seed after soaking or after
15 germination before transplantation (JP Patent Appl. Publ. No. 9224424, JP Patent Appl. Publ. No. 11028006, JP Patent Appl. Publ. No. 11049612). This strategy is however not always satisfactory, as the pesticides used may not remain on the seed in sufficient concentration and is washed off after incubation or transplantation, respectively, so that disease or pest protection is not sufficient.

- EP 1 078 563 B1 for example describes seed coating compositions for low temperature applications in
20 which the seed is coated with a coating composition comprising a polymer and at least one active ingredient. These compositions may be used for rice seed for direct sowing but are however not suitable for rice seed if it is to be soaked and incubated first before sowing due to wash-off of the coating.

- Thus, the object of the present invention is to improve these demerits and to significantly reduce the amount of agrochemicals used compared with those used in the conventional nursery-box treatment, and
25 to offer a method for preventing diseases and/or controlling animal pests in transplanted rice, which is simple and less expensive, having a long residual effect in rice paddies.

- Through dedicated studies to solve the above-mentioned problems, the inventors have found that by treating rice seeds with at least an ethylene-vinylacetate copolymer and at least one agrochemical coated rice seed can be obtained which may be soaked in water and incubated without substantially wash-off of
30 the agrochemical. It was surprisingly found that ethylene-vinylacetate copolymers are sufficiently water permeable so that the soaking and incubation is not hindered so that mostly now or only a little reduction in germination rate is observed compared to untreated rice seed. At the same time, the ethylene-vinylacetate copolymers are not dissolved in the soaking water and may serve for example as a matrix or substrate for the agrochemical.

Hence, a first embodiment of the present invention is a method for preparing a coated rice seed wherein a seed coating is at least partially applied to the surface of dry rice seed, wherein the method is characterized in that the seed coating comprises at least an ethylene-vinylacetate copolymer and at least one agrochemical.

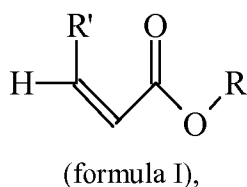
- 5 In the present invention, the term “copolymer” is used for any polymer, which comprises two or more different monomers. In particular, polymers comprising 3 or 4 different monomers are also regarded as “copolymers” according to the present invention.

The term “dry rice seed” means rice in a form, which is suitable for storage to be used as seed later on. The rice seed may have a rest water content typical for rice seed, for example 20 wt.-% or less, in particular 15 wt.-% or less, preferably 14 wt.-% or less. The water content can be determined by typical
10 moisture analyzers for cereals like the Pfeuffer HE50, or by titration according to the Karl-Fischer method.

The seed can be coated once or several times, whereas the coating layers may have identical or different compositions. For example, the inner coating layer may comprise the ethylene-vinylacetate copolymer and at least one fungicide, whereas the next outer layer may comprise at least one insecticide, optionally
15 with a binder, like a polymer-binder of any suitable kind or the ethylene-vinylacetate copolymer described in the present invention.

According to a preferred embodiment of the present invention, the copolymer is prepared by reacting at least the following monomers:

- 20 a) Vinyl acetate,
b) a (meth)acrylic monomer of the general formula (I)



wherein R is a saturated or unsaturated organic radical having at least 3 carbon atoms and R' is Hydrogen or a methyl group, and

- 25 c) ethylene.

These monomers may preferably be present in amounts of 35 to 50 wt.-% vinyl acetate, in particular 38 to 48 wt.-%, preferably 40 to 45 wt.-%; 25 - 55 % wt.-% (meth)acrylic monomer of the general formula (I), in particular 30 to 50 wt.-%, preferably 35 to 45 wt.-%, especially preferred 35-40 wt.-%; 5 to 25 wt.-%

% ethylene, in particular 8 to 20 wt.-%, preferably 10 to 18 wt.-%; and 0 to 5 wt.-% acrylic acid, in particular 0,1 to 4,5 wt.-%, preferably 0,5 to 4,0 wt.-%.

In an alternative embodiment these monomers may preferably be present in amounts of 35 to 50 wt.-% vinyl acetate, in particular 38 to 48 wt.-%, preferably 40 to 45 wt.-%; 25 - 55 % wt.-% (meth)acrylic monomer of the general formula (I), in particular 30 to 50 wt.-%, preferably 35 to 45 wt.-%, especially preferred 35-40 wt.-%; 5 to 25 wt.-% ethylene, in particular 10 to 25 wt.-%, preferably 15 to 23 wt.-%.

In another preferred embodiment additionally to the components above acrylic acid is present in amounts of 0 to 5 wt.-%, in particular 0,1 to 4,5 wt.-%, preferably 0,5 to 4,0 wt.-%.

Such copolymers are advantageous, as they may effectively prevent wash-off of agrochemicals from the seed during soaking and incubation, while still being sufficiently water permeable. Furthermore, if such copolymers are used as a water-based dispersion, most agrochemicals can be added and mixed and a stable dispersion is obtained, which makes further processing, i.e. the coating of the seed, easy to handle. Finally, copolymers with the above-mentioned amounts of monomers provide tackiness at room temperature conditions, which is advantageous for fixing the coating to the seed.

The (meth)acrylic monomer is defined as an acrylic monomer of formula I, i.e. $R' = H$, a methacrylic monomer of formula I, i.e. $R' = CH_3$ or a mixture of both.

In a preferred embodiment, the copolymer is free of acrylic acid.

In a particularly preferred embodiment, the copolymer consists of vinyl acetate, the (meth)acrylic monomer of the general formula (I) and ethylene.

Further preferred, the copolymer consists of 40 to 45 wt.-% vinyl acetate; 35 - 45 wt.-% ethylhexylacrylate, and 15 to 23 wt.-% ethylene, wherein the polymer is free of acrylic acid chemically bound within the polymer.

If not otherwise indicated in this application percentages in general and particular for monomers add up to 100 %.

The copolymers used for the inventive method can be prepared by any method, known to the skilled person. In particular, the copolymers can be prepared by radical emulsion polymerization, just to give an example. The emulsion may be manufactured using a standard emulsion polymerization route under pressure, which is widely used in the manufacture of copolymers, which incorporate gaseous monomers, such as ethylene. The emulsion can be prepared using a batch, semi-batch, or continuous feed batch, all three techniques are used in industry.

The (meth)acrylic monomer of the general formula (I) may comprise one or more alkyl (meth)acrylates, i. e. one or more (meth)acrylic acid alkyl ester monomers. Useful alkyl (meth)acrylates include linear or

branched monofunctional unsaturated (meth)acrylates of tertiary or non-tertiary alkyl alcohols, the alkyl groups of which have from 4 to 15 and, in particular, from 5 to 10 carbon atoms, i.e. the substituent R in formula I has 4 to 15 carbon atoms, in particular 5 to 10, whereas R is preferably selected from n-butyl, n-pentyl, n-hexyl, cyclohexyl, isoheptyl, n-nonyl, n-decyl, isohexyl, isobornyl, 2-ethylloctyl, isooctyl, 2-ethylhexyl, tetrahydrofurfuryl, ethoxyethoxyethyl, phenoxyethyl, cyclic trimethylpropane formal, 3,3,5-trimethylcyclohexyl, t-butylcyclohexyl and/ or t-butyl. In other words, examples of these alkyl acrylates include n-butyl, n-pentyl, n-hexyl, cyclohexyl, isoheptyl, n-nonyl, n-decyl, isohexyl, isobornyl, 2-ethylloctyl, isooctyl, 2-ethylhexyl, tetrahydrofurfuryl, ethoxyethoxyethyl, phenoxyethyl, cyclic trimethylpropane formal, 3,3,5-trimethylcyclohexyl, t-butylcyclohexyl, t-butyl acrylates and methacrylates. Preferred alkyl acrylates include isooctyl acrylate, 2-ethylhexyl acrylate, n-butylacrylate, tetrahydrofurfuryl acrylate, isobornyl acrylate, ethoxyethoxyethyl acrylate, phenoxyethyl acrylate, 3,3,5-trimethylcyclohexyl acrylate, and cyclohexyl acrylate.

In a further preferred embodiment, the copolymer is an ethylene-2-ethylhexyl acrylate-vinyl acetate copolymer.

The copolymer used in the present invention may have a glass transition temperature T_g of -100 to 20 °C, measured by dynamic differential scanning calorimetry according to DIN 53 765 with a heating rate of 20 K/min and a definition of T_g as midpoint temperature using the tangent method and nitrogen as inert gas, whereas T_g is in particular -60 to 20 °C, preferably -10 °C or less, more preferably -20 °C or less. Particularly preferred is a T_g from -60 to 0 °C, -60 to -20 °C or -60 to -40 °C. This is advantageous because the copolymer stays elastic and also tacky under normal storing temperature conditions of rice seed, so that a good fixation of the coating is achieved and delamination of the coating can be avoided.

The copolymer may be applied to the seed in any form known to the skilled person, preferably in the form of a dispersion. A water-based dispersion is preferred, as no negative influence of the solvent with respect to the germination rate has to be feared. The rice seed is dried after the coating is applied. This can be achieved at room temperature or slightly elevated temperatures, for example at 30 or 35 °C. Techniques like blowing warm air or spray drying may also be used.

For easy handling, the copolymer dispersion may have a Brookfield Viscosity of 500 to $30,000$ mPa·s, measured according to DIN EN ISO 2555, RVT, spindle no. 4, at 20 rpm and 25 °C, in particular from $1,000$ to $30,000$ mPa·s, preferably from $1,500$ to $20,000$ mPa·s, more preferably from $2,000$ to $10,000$ mPa·s. This allows an easy coating procedure while ensuring that a desired coating thickness is achieved. Otherwise, coating may be repeated once or several times with drying steps after each coating step, until the desired coating thickness is achieved. The additional coating layer(s) may also contain no agrochemical, so it works as a protective layer.

In one embodiment the copolymer of the present invention may have a weight average molecular weight Mw in the range of 10,000 to 300,000 g/mol, preferably 100,000 to 300,000 g/mol, and more preferred 125,000 – 300,000 g/mol; even more preferably 200,000 to 280,000 g/mol, e.g. 240,000 ±10,000 g/mol, and the monomers may preferably be present in amounts of 35 to 50 wt.-% vinyl acetate, in particular 38 to 48 wt.-%, preferably 40 to 45 wt.-%; 25 - 55 % wt.-% (meth)acrylic monomer of the general formula (I), in particular 30 to 50 wt.-%, preferably 35 to 45 wt.-%, especially preferred 35-40 wt.-%; 5 to 25 wt.-% ethylene, in particular 10 to 25 wt.-%, preferably 15 to 23 wt.-%; wherein the copolymer is free of acrylic acid. .

In one embodiment the copolymer of the present invention may have a weight average molecular weight Mw in the range of 10,000 to 125,000 g/mol, wherein in a first embodiment the copolymer of the present invention may have a weight average molecular weight Mw in the range of 10,000 to 75,000 g/mol, preferably 10,000 to 25,000 g/mol, and more preferred 10,000 – 18,000 g/mol; and in a second embodiment from 75,000 to 125,000 g/mol.

In particular in one embodiment the copolymer of the present invention may have a weight average molecular weight Mw in the range of 10,000 to 75,000, preferably 10,000 to 25,000 g/mol, and more preferred 10,000 – 18,000 g/mol, and the monomers may preferably be present in amounts of 35 to 50 wt.-% vinyl acetate, in particular 38 to 48 wt.-%, preferably 40 to 45 wt.-%; 25 - 55 % wt.-% (meth)acrylic monomer of the general formula (I), in particular 30 to 50 wt.-%, preferably 35 to 45 wt.-%, especially preferred 35-40 wt.-%; 5 to 25 wt.-% ethylene, in particular 10 to 25 wt.-%, preferably 15 to 23 wt.-%; wherein the copolymer is free of acrylic acid. In a further embodiment the copolymer of the present invention may have a weight average molecular weight Mw in the range of 125,000 to 250,000 g/mol.

In still a further embodiment the copolymer of the present invention may have a weight average molecular weight Mw in the range of 250,000 to 1,500,000 g/mol, wherein in a first embodiment the copolymer of the present invention may have a weight average molecular weight Mw in the range of 250,000 to 750,000 g/mol and in a second embodiment from 750,000 to 1,500,000 g/mol, preferably 1,000,000 to 1,500,000 g/mol, and more preferred 1,150,000 – 1,450,000 g/mol.

In particular in one embodiment the copolymer of the present invention may have a weight average molecular weight Mw in the range of 750,000 to 1,500,000 g/mol, preferably 1,000,000 to 1,500,000 g/mol, and more preferred 1,150,000 – 1,450,000 g/mol, and the monomers may preferably be present in amounts of 35 to 50 wt.-% vinyl acetate, in particular 38 to 48 wt.-%, preferably 40 to 45 wt.-%; 25 - 55 % wt.-% (meth)acrylic monomer of the general formula (I), in particular 30 to 50 wt.-%, preferably 35 to 45 wt.-%, especially preferred 35-40 wt.-%; 5 to 25 wt.-% ethylene, in particular 10 to 25 wt.-%, preferably 15 to 23 wt.-%; wherein the copolymer is free of acrylic acid.

In still a further embodiment the copolymer of the present invention may have a weight average molecular weight M_w in the range of 1,500,000 to 10,000,000 g/mol, wherein in a first embodiment the copolymer of the present invention may have a weight average molecular weight M_w in the range of 1,500,000 to 5,550,000 g/mol, preferably 1,500,000 to 3,000,000 g/mol, and more preferred 1,500,000 – 2,000,000 g/mol; and in a second embodiment from 5,500,000 to 10,000,000 g/mol.

In particular in one embodiment the copolymer of the present invention may have a weight average molecular weight M_w in the range of 1,500,000 to 5,550,000 g/mol, preferably 1,500,000 to 3,000,000 g/mol, and more preferred 1,500,000 – 2,000,000 g/mol, and the monomers may preferably be present in amounts of 35 to 50 wt.-% vinyl acetate, in particular 38 to 48 wt.-%, preferably 40 to 45 wt.-%; 25 - 55 % wt.-% (meth)acrylic monomer of the general formula (I), in particular 30 to 50 wt.-%, preferably 35 to 45 wt.-%, especially preferred 35-40 wt.-%; 5 to 25 wt.-% ethylene, in particular 10 to 25 wt.-%, preferably 15 to 23 wt.-%; wherein the copolymer is free of acrylic acid.

Preferably, in the above paragraphs, the (meth)acrylic monomer is ethylhexylacrylate.

The weight average molecular weight M_w can be determined via gel permeation chromatography (GPC) in trichlorobenzene as solvent and polystyrene as standard.

In a preferred embodiment the weight average molecular weight M_w is determined via gel permeation chromatography (GPC) with dichloromethane as eluent and polystyrene as standard.

Starting from the dispersion the sample for GPC is preferably prepared by drying the dispersion with sodium sulfate (e.g. 1 g dispersion / 20 g sodium sulfate), pestleing of the resulting mixture and Soxhletextraction of the mixture with chloroform for 6 hours. The extract is dried over sodium sulfate, filtered and the solvent removed, preferably under reduced pressure. The residue is used for GPC.

Preferably the copolymer of the instant invention is a copolymer having the peak of the main mass-peak at $140,000 \pm 20,000$ g/mol, (GPC dichloromethane, polystyrene standard, flowrate 1,0 ml/min, injection volume 100 μ l (mikroliter), $T = 30^\circ\text{C}$).

Further preferred, the main-mass peak comprises more than 70 % (F[%]) of the mass of the polymer, more preferred more than 75 % and most preferred more than 80 %.

Also preferred, the copolymer has a polydispersity ($D = M_w/M_n$) in the range of 50 – 150, preferably 80 – 120.

In a most preferred embodiment, the copolymer of the present invention may have a weight average molecular weight M_w in the range 200,000 to 280,000 g/mol, and vinyl acetate is present in 38 to 48 wt.-%, (meth)acrylic monomer of the general formula (I) in 35-40 wt.-%; and ethylene in 15 to 23 wt.-%.

%; wherein the copolymer is free of acrylic acid, and the copolymer having the peak of the main mass-peak at $140,000 \pm 20,000$ g/mol, (GPC dichloromethane, polystyrene standard, flowrate 1,0 ml/min, injection volume 100 μ l (mikroliter), T= 30°C).

5 Further in the most preferred embodiment, the main-mass peak comprises more than 80 % (F[%]) of the mass of the polymer, and copolymer has a polydispersity ($D = M_w/M_n$) in the range of 80 – 120.

In an alternatively preferred embodiment, the copolymer of the present invention may have a weight average molecular weight M_w in the range 125,000 to 250,000 g/mol, and vinyl acetate is present in 38 to 48 wt.-%, (meth)acrylic monomer of the general formula (I) in 35-40 wt.-%; and ethylene in 15 to 23 wt.-%; wherein the copolymer is free of acrylic acid, and the copolymer having the peak of the main
10 mass-peak at $140,000 \pm 20,000$ g/mol, (GPC dichloromethane, polystyrene standard, flowrate 1,0 ml/min, injection volume 100 μ l (mikroliter), T= 30°C).

Further in the most preferred embodiment, the main-mass peak comprises more than 80 % (F[%]) of the mass of the polymer, and copolymer has a polydispersity ($D = M_w/M_n$) in the range of 80 – 120.

The dispersion may for example have a solids content of 30 to 80 wt.-%, measured according to DIN EN
15 ISO 3251, 30 mins, at 130 °C, in particular from 50 to 70 wt.-%, preferably from 55 to 65 wt.-%. When using dispersions with such solids contents, it is preferred that the dosage of the dispersion to an overall coating formulation including the agrochemical(s) is from 1 to 20 wt.-%, more preferred from 2 to 15 wt.-%, most preferred from 3 to 12 wt.-%.

The pH value of the dispersion may range from 4 to 7, measured according to DIN ISO 976 in a 1:1
20 mixture with water, in particular from 4.5 to 6.5. The dispersion may show an average particle size of 0.1 to 5 μ m, in particular from 0.2 to 2.0 μ m. The average particle size d_{50} is that size, above and below which 50 wt.-% are found. It can be measured by using an ultra centrifuge (W. Scholtan, H. Lange, Kolloid, Z. und Z. Polymere 250 (1972), 782-796).

In order to improve the film forming properties, it is advantageous that the dispersion has a minimum
25 film forming temperature of 0 °C, measured according to DIN ISO 2115.

According to a further preferred embodiment of the present invention, the dispersion is mostly free of plasticizers and/ or non-ionic detergents, in particular mostly free of alkylphenolethoxylate. This is advantageous as the inventive copolymers may be provided as water-based dispersion without the need of adding the before mentioned additives which may cause environmental problem. This is particularly
30 true for non-ionic detergents, especially alkylphenolethoxylate.

With regard to the present invention, any agrochemical can be used for providing the coating. So the agrochemical may be selected from the group comprising insecticides, fungicides, bactericides,

virucides, miticides, molluscicides, nematocides, ovicides, repellents, rodenticides, herbicides, safeners, fertilizers, biologicals, or mixtures thereof.

The agrochemicals, or in the following also titled as “active ingredients” (“a.i.”) are specified herein by their “common name”, known and described, for example, in the Pesticide Manual (“The Pesticide Manual”, 14th Ed., British Crop Protection Council 2006) or can be searched in the internet (e.g. <http://www.alanwood.net/pesticides>).

Where a compound (A) or a compound (B) can be present in tautomeric form, such a compound is understood hereinabove and herein below also to include, where applicable, corresponding tautomeric forms, even when these are not specifically mentioned in each case.

- 1) Inhibitors of the ergosterol biosynthesis, for example (1.1) aldimorph, (1.2) azaconazole, (1.3) bitertanol, (1.4) bromuconazole, (1.5) cyproconazole, (1.6) diclobutrazole, (1.7) difenoconazole, (1.8) diniconazole, (1.9) diniconazole-M, (1.10) dodemorph, (1.11) dodemorph acetate, (1.12) epoxiconazole, (1.13) etaconazole, (1.14) fenarimol, (1.15) fenbuconazole, (1.16) fenhexamid, (1.17) fenpropidin, (1.18) fenpropimorph, (1.19) fluquinconazole, (1.20) flurprimidol, (1.21) flusilazole, (1.22) flutriafol, (1.23) furconazole, (1.24) furconazole-cis, (1.25) hexaconazole, (1.26) imazalil, (1.27) imazalil sulfate, (1.28) imibenconazole, (1.29) ipconazole, (1.30) metconazole, (1.31) myclobutanil, (1.32) naftifine, (1.33) nuarimol, (1.34) oxpoconazole, (1.35) paclobutrazol, (1.36) pefurazoate, (1.37) penconazole, (1.38) piperalin, (1.39) prochloraz, (1.40) propiconazole, (1.41) prothioconazole, (1.42) pyributicarb, (1.43) pyrifenoxy, (1.44) quinconazole, (1.45) simeconazole, (1.46) spiroxamine, (1.47) tebuconazole, (1.48) terbinafine, (1.49) tetraconazole, (1.50) triadimefon, (1.51) triadimenol, (1.52) tridemorph, (1.53) triflumizole, (1.54) triforine, (1.55) triticonazole, (1.56) uniconazole, (1.57) uniconazole-p, (1.58) viniconazole, (1.59) voriconazole, (1.60) 1-(4-chlorophenyl)-2-(1H-1,2,4-triazol-1-yl)cycloheptanol, (1.61) methyl 1-(2,2-dimethyl-2,3-dihydro-1H-inden-1-yl)-1H-imidazole-5-carboxylate, (1.62) N'-{5-(difluoromethyl)-2-methyl-4-[3-(trimethylsilyl)propoxy]phenyl}-N-ethyl-N-methylimidoformamide, (1.63) N-ethyl-N-methyl-N'-{2-methyl-5-(trifluoromethyl)-4-[3-(trimethylsilyl)propoxy]phenyl} imidoformamide, (1.64) O-[1-(4-methoxyphenoxy)-3,3-dimethylbutan-2-yl] 1H-imidazole-1-carbothioate, (1.65) Pyrisoxazole.

- 2) Inhibitors of the respiratory chain at complex I or II, for example (2.1) bixafen, (2.2) boscalid, (2.3) carboxin, (2.4) diflumentorim, (2.5) fenfuram, (2.6) fluopyram, (2.7) flutolanil, (2.8) fluxapyroxad, (2.9) furametpyr, (2.10) furmecyclox, (2.11) isopyrazam (mixture of syn-epimeric racemate 1RS,4SR,9RS and anti-epimeric racemate 1RS,4SR,9SR), (2.12) isopyrazam (anti-epimeric racemate 1RS,4SR,9SR), (2.13) isopyrazam (anti-epimeric enantiomer 1R,4S,9S), (2.14) isopyrazam (anti-epimeric enantiomer 1S,4R,9R), (2.15) isopyrazam (syn epimeric racemate 1RS,4SR,9RS), (2.16) isopyrazam (syn-epimeric enantiomer 1R,4S,9R), (2.17) isopyrazam (syn-epimeric enantiomer 1S,4R,9S), (2.18) mepronil, (2.19) oxycarboxin, (2.20) penflufen, (2.21) penthiopyrad, (2.22) sedaxane, (2.23) thifluzamide, (2.24) 1-methyl-N-[2-(1,1,2,2-tetrafluoroethoxy)phenyl]-3-(trifluoromethyl)-1H-pyrazole-4-carboxamide, (2.25)

- 3-(difluoromethyl)-1-methyl-N-[2-(1,1,2,2-tetrafluoroethoxy)phenyl]-1H-pyrazole-4-carboxamide,
(2.26) 3-(difluoromethyl)-N-[4-fluoro-2-(1,1,2,3,3,3-hexafluoropropoxy)phenyl]-1-methyl-1H-pyrazole-
4-carboxamide, (2.27) N-[1-(2,4-dichlorophenyl)-1-methoxypropan-2-yl]-3-(difluoromethyl)-1-methyl-
1H-pyrazole-4-carboxamide, (2.28) 5,8-difluoro-N-[2-(2-fluoro-4-{[4-(trifluoromethyl)pyridin-2-
5 yl]oxy}phenyl)ethyl]quinazolin-4-amine, (2.29) benzovindiflupyr, (2.30) N-[(1S,4R)-9-
(dichloromethylene)-1,2,3,4-tetrahydro-1,4-methanonaphthalen-5-yl]-3-(difluoromethyl)-1-methyl-1H-
pyrazole-4-carboxamide, (2.31) N-[(1R,4S)-9-(dichloromethylene)-1,2,3,4-tetrahydro-1,4-
methanonaphthalen-5-yl]-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide, (2.32) 3-
(difluoromethyl)-1-methyl-N-(1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl)-1H-pyrazole-4-carboxamide,
10 (2.33) 1,3,5-trimethyl-N-(1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl)-1H-pyrazole-4-carboxamide,
(2.34) 1-methyl-3-(trifluoromethyl)-N-(1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl)-1H-pyrazole-4-
carboxamide, (2.35) 1-methyl-3-(trifluoromethyl)-N-[(3R)-1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl]-
1H-pyrazole-4-carboxamide, (2.36) 1-methyl-3-(trifluoromethyl)-N-[(3S)-1,1,3-trimethyl-2,3-dihydro-
1H-inden-4-yl]-1H-pyrazole-4-carboxamide, (2.37) 3-(difluoromethyl)-1-methyl-N-[(3S)-1,1,3-
15 trimethyl-2,3-dihydro-1H-inden-4-yl]-1H-pyrazole-4-carboxamide, (2.38) 3-(difluoromethyl)-1-methyl-
N-[(3R)-1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl]-1H-pyrazole-4-carboxamide, (2.39) 1,3,5-
trimethyl-N-[(3R)-1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl]-1H-pyrazole-4-carboxamide, (2.40)
1,3,5-trimethyl-N-[(3S)-1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl]-1H-pyrazole-4-carboxamide, (2.41)
benodanil, (2.42) 2-chloro-N-(1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl)pyridine-3-carboxamide,
20 (2.43) Isofetamid.
- 3) Inhibitors of the respiratory chain at complex III, for example (3.1) ametocradin, (3.2) amisulbrom,
(3.3) azoxystrobin, (3.4) cyazofamid, (3.5) coumethoxystrobin, (3.6) coumoxystrobin, (3.7)
dimoxystrobin, (3.8) enoxastrobin, (3.9) famoxadone, (3.10) fenamidone, (3.11) flufenoxystrobin, (3.12)
fluoxastrobin, (3.13) kresoxim-methyl, (3.14) metominostrobin, (3.15) orysastrobin, (3.16)
25 picoxystrobin, (3.17) pyraclostrobin, (3.18) pyrametostrobin, (3.19) pyraoxystrobin, (3.20) pyribencarb,
(3.21) triclopyricarb, (3.22) trifloxystrobin, (3.23) (2E)-2-(2-{[6-(3-chloro-2-methylphenoxy)-5-
fluoropyrimidin-4-yl]oxy}phenyl)-2-(methoxyimino)-N-methylacetamide, (3.24) (2E)-2-
(methoxyimino)-N-methyl-2-(2-{[(1E)-1-[3-(trifluoromethyl)phenyl]ethylidene}amino]oxy)methyl}
phenyl)acetamide, (3.25) (2E)-2-(methoxyimino)-N-methyl-2-{2-[(E)-({1-[3-(trifluoromethyl)phenyl]
30 ethoxy}imino)methyl]phenyl}acetamide, (3.26) (2E)-2-{2-[(E)-({1-[3-(trifluoromethyl)phenyl]
oxy}phenyl)ethylidene]amino}oxy)methyl]phenyl}-2-(methoxyimino)-N-methylacetamide, (3.27)
Fenaminostrobin, (3.28) 5-methoxy-2-methyl-4-(2-{[(1E)-1-[3-(trifluoromethyl)phenyl]ethylidene}
amino]oxy)methyl]phenyl)-2,4-dihydro-3H-1,2,4-triazol-3-one, (3.29) methyl (2E)-2-{2-[(cyclopropyl
[(4-methoxyphenyl)imino]methyl)sulfanyl]methyl]phenyl}-3-methoxyacrylate, (3.30) N-(3-ethyl-3,5,5-
35 trimethylcyclohexyl)-3-formamido-2-hydroxybenzamide, (3.31) 2-{2-[(2,5-dimethylphenoxy)methyl]
phenyl}-2-methoxy-N-methylacetamide, (3.32) 2-{2-[(2,5-dimethylphenoxy)methyl]phenyl}-2-
methoxy-N-methylacetamide.

- 4) Inhibitors of the mitosis and cell division, for example (4.1) benomyl, (4.2) carbendazim, (4.3) chlorfenazole, (4.4) diethofencarb, (4.5) ethaboxam, (4.6) fluopicolide, (4.7) fuberidazole, (4.8) pencycuron, (4.9) thiabendazole, (4.10) thiophanate-methyl, (4.11) thiophanate, (4.12) zoxamide, (4.13) 5-chloro-7-(4-methylpiperidin-1-yl)-6-(2,4,6-trifluorophenyl)[1,2,4]triazolo[1,5-a]pyrimidine, (4.14) 3-chloro-5-(6-chloropyridin-3-yl)-6-methyl-4-(2,4,6-trifluorophenyl)pyridazine.
- 5) Compounds capable to have a multisite action, for example (5.1) bordeaux mixture, (5.2) captafol, (5.3) captan, (5.4) chlorothalonil, (5.5) copper hydroxide, (5.6) copper naphthenate, (5.7) copper oxide, (5.8) copper oxychloride, (5.9) copper(2+) sulfate, (5.10) dichlofluanid, (5.11) dithianon, (5.12) dodine, (5.13) dodine free base, (5.14) ferbam, (5.15) fluorofolpet, (5.16) folpet, (5.17) guazatine, (5.18) guazatine acetate, (5.19) iminoctadine, (5.20) iminoctadine albesilate, (5.21) iminoctadine triacetate, (5.22) mancooper, (5.23) mancozeb, (5.24) maneb, (5.25) metiram, (5.26) metiram zinc, (5.27) oxine-copper, (5.28) propamidine, (5.29) propineb, (5.30) sulfur and sulfur preparations including calcium polysulfide, (5.31) thiram, (5.32) tolylfluanid, (5.33) zineb, (5.34) ziram, (5.35) anilazine.
- 6) Compounds capable to induce a host defence, for example (6.1) acibenzolar-S-methyl, (6.2) isotianil, (6.3) probenazole, (6.4) tiadinil, (6.5) laminarin.
- 7) Inhibitors of the amino acid and/or protein biosynthesis, for example (7.1) andoprim, (7.2) blasticidin-S, (7.3) cyprodinil, (7.4) kasugamycin, (7.5) kasugamycin hydrochloride hydrate, (7.6) mepanipyrim, (7.7) pyrimethanil, (7.8) 3-(5-fluoro-3,3,4,4-tetramethyl-3,4-dihydroisoquinolin-1-yl)quinoline, (7.9) oxytetracycline, (7.10) streptomycin.
- 8) Inhibitors of the ATP production, for example (8.1) fentin acetate, (8.2) fentin chloride, (8.3) fentin hydroxide, (8.4) silthiofam.
- 9) Inhibitors of the cell wall synthesis, for example (9.1) benthiavalicarb, (9.2) dimethomorph, (9.3) flumorph, (9.4) iprovalicarb, (9.5) mandipropamid, (9.6) polyoxins, (9.7) polyoxorim, (9.8) validamycin A, (9.9) valifenalate, (9.10) polyoxin B.
- 10) Inhibitors of the lipid and membrane synthesis, for example (10.1) biphenyl, (10.2) chloroneb, (10.3) dicloran, (10.4) edifenphos, (10.5) etridiazole, (10.6) iodocarb, (10.7) iprobenfos, (10.8) isoprothiolane, (10.9) propamocarb, (10.10) propamocarb hydrochloride, (10.11) prothiocarb, (10.12) pyrazophos, (10.13) quintozone, (10.14) tecnazene, (10.15) tolclofos-methyl.
- 11) Inhibitors of the melanin biosynthesis, for example (11.1) carpropamid, (11.2) diclocymet, (11.3) fenoxanil, (11.4) phthalide, (11.5) pyroquilon, (11.6) tricyclazole, (11.7) 2,2,2-trifluoroethyl {3-methyl-1-[(4-methylbenzoyl)amino]butan-2-yl} carbamate.
- 12) Inhibitors of the nucleic acid synthesis, for example (12.1) benalaxyl, (12.2) benalaxyl-M (kiralaxyl), (12.3) bupirimate, (12.4) clozylacon, (12.5) dimethirimol, (12.6) ethirimol, (12.7) furalaxyl, (12.8)

hymexazol, (12.9) metalaxyl, (12.10) metalaxyl-M (mefenoxam), (12.11) ofurace, (12.12) oxadixyl, (12.13) oxolinic acid, (12.14) othilinone.

13) Inhibitors of the signal transduction, for example (13.1) chlozolate, (13.2) fenpiclonil, (13.3) fludioxonil, (13.4) iprodione, (13.5) procymidone, (13.6) quinoxifen, (13.7) vinclozolin, (13.8) proquinazid.

14) Compounds capable to act as an uncoupler, for example (14.1) binapacryl, (14.2) dinocap, (14.3) ferimzone, (14.4) fluazinam, (14.5) meptyldinocap.

15) Further compounds, for example (15.1) benthiazole, (15.2) bethoxazin, (15.3) capsimycin, (15.4) carvone, (15.5) chinomethionat, (15.6) pyriofenone (chlazafenone), (15.7) cufraneb, (15.8) cyflufenamid, (15.9) cymoxanil, (15.10) cyprosulfamide, (15.11) dazomet, (15.12) debacarb, (15.13) dichlorophen, (15.14) diclomezine, (15.15) difenzoquat, (15.16) difenzoquat metilsulfate, (15.17) diphenylamine, (15.18) ecomate, (15.19) fenpyrazamine, (15.20) flumetover, (15.21) fluoroimide, (15.22) flusulfamide, (15.23) flutianil, (15.24) fosetyl-aluminium, (15.25) fosetyl-calcium, (15.26) fosetyl-sodium, (15.27) hexachlorobenzene, (15.28) irumamycin, (15.29) methasulfocarb, (15.30) methyl isothiocyanate, (15.31) metrafenone, (15.32) mildiomyacin, (15.33) natamycin, (15.34) nickel dimethyldithiocarbamate, (15.35) nitrothal-isopropyl, (15.37) oxamocarb, (15.38) oxyfenthiiin, (15.39) pentachlorophenol and salts, (15.40) phenothrin, (15.41) phosphorous acid and its salts, (15.42) propamocarb-fosetylate, (15.43) propanosine-sodium, (15.44) pyrimorph, (15.45) (2E)-3-(4-tert-butylphenyl)-3-(2-chloropyridin-4-yl)-1-(morpholin-4-yl)prop-2-en-1-one, (15.46) (2Z)-3-(4-tert-butylphenyl)-3-(2-chloropyridin-4-yl)-1-(morpholin-4-yl)prop-2-en-1-one, (15.47) pyrrolnitrine, (15.48) tebufloquin, (15.49) tecloftalam, (15.50) tolmanide, (15.51) triazoxide, (15.52) trichlamide, (15.53) zarilamid, (15.54) (3S,6S,7R,8R)-8-benzyl-3-[(3-[(isobutyryloxy)methoxy]-4-methoxypyridin-2-yl)carbonyl]amino]-6-methyl-4,9-dioxo-1,5-dioxonan-7-yl 2-methylpropanoate, (15.55) 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, (15.56) 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, (15.57) 1-(4-{4-[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, (15.58) 1-(4-methoxyphenoxy)-3,3-dimethylbutan-2-yl 1H-imidazole-1-carboxylate, (15.59) 2,3,5,6-tetrachloro-4-(methylsulfonyl)pyridine, (15.60) 2,3-dibutyl-6-chlorothieno[2,3-d]pyrimidin-4(3H)-one, (15.61) 2,6-dimethyl-1H,5H-[1,4]dithiino[2,3-c:5,6-c']dipyrrole-1,3,5,7(2H,6H)-tetrone, (15.62) 2-[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]-1-(4-{4-[(5R)-5-phenyl-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)ethanone, (15.63) 2-[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]-1-(4-{4-[(5S)-5-phenyl-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)ethanone, (15.64) 2-[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]-1-{4-[4-(5-phenyl-4,5-dihydro-1,2-oxazol-3-yl)-1,3-thiazol-2-yl]piperidin-1-yl}ethanone, (15.65) 2-butoxy-6-iodo-3-propyl-4H-chromen-4-one, (15.66) 2-chloro-5-[2-chloro-1-(2,6-difluoro-4-methoxyphenyl)-4-

methyl-1H-imidazol-5-yl]pyridine, (15.67) 2-phenylphenol and salts, (15.68) 3-(4,4,5-trifluoro-3,3-dimethyl-3,4-dihydroisoquinolin-1-yl)quinoline, (15.69) 3,4,5-trichloropyridine-2,6-dicarbonitrile, (15.70) 3-chloro-5-(4-chlorophenyl)-4-(2,6-difluorophenyl)-6-methylpyridazine, (15.71) 4-(4-chlorophenyl)-5-(2,6-difluorophenyl)-3,6-dimethylpyridazine, (15.72) 5-amino-1,3,4-thiadiazole-2-thiol, (15.73) 5-chloro-N'-phenyl-N'-(prop-2-yn-1-yl)thiophene-2-sulfonohydrazide, (15.74) 5-fluoro-2-[(4-fluorobenzyl)oxy]pyrimidin-4-amine, (15.75) 5-fluoro-2-[(4-methylbenzyl)oxy]pyrimidin-4-amine, (15.76) 5-methyl-6-octyl[1,2,4]triazolo[1,5-a]pyrimidin-7-amine, (15.77) ethyl (2Z)-3-amino-2-cyano-3-phenylacrylate, (15.78) N'-(4-{[3-(4-chlorobenzyl)-1,2,4-thiadiazol-5-yl]oxy}-2,5-dimethylphenyl)-N-ethyl-N-methylimidoformamide, (15.79) N-(4-chlorobenzyl)-3-[3-methoxy-4-(prop-2-yn-1-yloxy)phenyl]propanamide, (15.80) N-[(4-chlorophenyl)(cyano)methyl]-3-[3-methoxy-4-(prop-2-yn-1-yloxy)phenyl]propanamide, (15.81) N-[(5-bromo-3-chloropyridin-2-yl)methyl]-2,4-dichloronicotinamide, (15.82) N-[1-(5-bromo-3-chloropyridin-2-yl)ethyl]-2,4-dichloronicotinamide, (15.83) N-[1-(5-bromo-3-chloropyridin-2-yl)ethyl]-2-fluoro-4-iodonicotinamide, (15.84) N-{(E)-[(cyclopropylmethoxy)imino][6-(difluoromethoxy)-2,3-difluorophenyl]methyl}-2-phenylacetamide, (15.85) N-{(Z)-[(cyclopropylmethoxy)imino][6-(difluoromethoxy)-2,3-difluorophenyl]methyl}-2-phenylacetamide, (15.86) N'-{4-[(3-tert-butyl-4-cyano-1,2-thiazol-5-yl)oxy]-2-chloro-5-methylphenyl}-N-ethyl-N-methylimidoformamide, (15.87) N-methyl-2-(1-{[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]acetyl}piperidin-4-yl)-N-(1,2,3,4-tetrahydronaphthalen-1-yl)-1,3-thiazole-4-carboxamide, (15.88) N-methyl-2-(1-{[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]acetyl}piperidin-4-yl)-N-[(1R)-1,2,3,4-tetrahydronaphthalen-1-yl]-1,3-thiazole-4-carboxamide, (15.89) N-methyl-2-(1-{[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]acetyl}piperidin-4-yl)-N-[(1S)-1,2,3,4-tetrahydronaphthalen-1-yl]-1,3-thiazole-4-carboxamide, (15.90) pentyl {6-[(1-methyl-1H-tetrazol-5-yl)(phenyl)methylene]amino}oxy)methyl]pyridin-2-yl} carbamate, (15.91) phenazine-1-carboxylic acid, (15.92) quinolin-8-ol, (15.93) quinolin-8-ol sulfate (2:1), (15.94) tert-butyl {6-[(1-methyl-1H-tetrazol-5-yl)(phenyl)methylene]amino}oxy)methyl]pyridin-2-yl} carbamate, (15.95) 1-methyl-3-(trifluoromethyl)-N-[2'-(trifluoromethyl)biphenyl-2-yl]-1H-pyrazole-4-carboxamide, (15.96) N-(4'-chlorobiphenyl-2-yl)-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide, (15.97) N-(2',4'-dichlorobiphenyl-2-yl)-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide, (15.98) 3-(difluoromethyl)-1-methyl-N-[4'-(trifluoromethyl)biphenyl-2-yl]-1H-pyrazole-4-carboxamide, (15.99) N-(2',5'-difluorobiphenyl-2-yl)-1-methyl-3-(trifluoromethyl)-1H-pyrazole-4-carboxamide, (15.100) 3-(difluoromethyl)-1-methyl-N-[4'-(prop-1-yn-1-yl)biphenyl-2-yl]-1H-pyrazole-4-carboxamide, (15.101) 5-fluoro-1,3-dimethyl-N-[4'-(prop-1-yn-1-yl)biphenyl-2-yl]-1H-pyrazole-4-carboxamide, (15.102) 2-chloro-N-[4'-(prop-1-yn-1-yl)biphenyl-2-yl]nicotinamide, (15.103) 3-(difluoromethyl)-N-[4'-(3,3-dimethylbut-1-yn-1-yl)biphenyl-2-yl]-1-methyl-1H-pyrazole-4-carboxamide, (15.104) N-[4'-(3,3-dimethylbut-1-yn-1-yl)biphenyl-2-yl]-5-fluoro-1,3-dimethyl-1H-pyrazole-4-carboxamide, (15.105) 3-(difluoromethyl)-N-(4'-ethynylbiphenyl-2-yl)-1-methyl-1H-pyrazole-4-carboxamide, (15.106) N-(4'-ethynylbiphenyl-2-yl)-5-fluoro-1,3-dimethyl-1H-pyrazole-4-carboxamide, (15.107) 2-chloro-N-(4'-ethynylbiphenyl-2-yl)nicotinamide, (15.108) 2-chloro-N-[4'-(3,3-dimethylbut-1-yn-1-yl)biphenyl-2-

- yl]nicotinamide, (15.109) 4-(difluoromethyl)-2-methyl-N-[4'-(trifluoromethyl)biphenyl-2-yl]-1,3-thiazole-5-carboxamide, (15.110) 5-fluoro-N-[4'-(3-hydroxy-3-methylbut-1-yn-1-yl)biphenyl-2-yl]-1,3-dimethyl-1H-pyrazole-4-carboxamide, (15.111) 2-chloro-N-[4'-(3-hydroxy-3-methylbut-1-yn-1-yl)biphenyl-2-yl]nicotinamide, (15.112) 3-(difluoromethyl)-N-[4'-(3-methoxy-3-methylbut-1-yn-1-yl)biphenyl-2-yl]-1-methyl-1H-pyrazole-4-carboxamide, (15.113) 5-fluoro-N-[4'-(3-methoxy-3-methylbut-1-yn-1-yl)biphenyl-2-yl]-1,3-dimethyl-1H-pyrazole-4-carboxamide, (15.114) 2-chloro-N-[4'-(3-methoxy-3-methylbut-1-yn-1-yl)biphenyl-2-yl]nicotinamide, (15.115) (5-bromo-2-methoxy-4-methylpyridin-3-yl)(2,3,4-trimethoxy-6-methylphenyl)methanone, (15.116) N-[2-(4-{[3-(4-chlorophenyl)prop-2-yn-1-yl]oxy}-3-methoxyphenyl)ethyl]-N2-(methylsulfonyl)valinamide, (15.117) 4-oxo-4-[(2-phenylethyl)amino]butanoic acid, (15.118) but-3-yn-1-yl {6-[(Z)-(1-methyl-1H-tetrazol-5-yl)(phenyl)methylene]amino}oxy)methyl]pyridin-2-yl} carbamate, (15.119) 4-amino-5-fluoropyrimidin-2-ol (tautomeric form: 4-amino-5-fluoropyrimidin-2(1H)-one), (15.120) propyl 3,4,5-trihydroxybenzoate, (15.121) 1,3-dimethyl-N-(1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl)-1H-pyrazole-4-carboxamide, (15.122) 1,3-dimethyl-N-[(3R)-1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl]-1H-pyrazole-4-carboxamide, (15.123) 1,3-dimethyl-N-[(3S)-1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl]-1H-pyrazole-4-carboxamide, (15.124) [3-(4-chloro-2-fluorophenyl)-5-(2,4-difluorophenyl)-1,2-oxazol-4-yl](pyridin-3-yl)methanol, (15.125) (S)-[3-(4-chloro-2-fluorophenyl)-5-(2,4-difluorophenyl)-1,2-oxazol-4-yl](pyridin-3-yl)methanol, (15.126) (R)-[3-(4-chloro-2-fluorophenyl)-5-(2,4-difluorophenyl)-1,2-oxazol-4-yl](pyridin-3-yl)methanol, (15.127) 2-{[3-(2-chlorophenyl)-2-(2,4-difluorophenyl)oxiran-2-yl]methyl}-2,4-dihydro-3H-1,2,4-triazole-3-thione, (15.128) 1-{[3-(2-chlorophenyl)-2-(2,4-difluorophenyl)oxiran-2-yl]methyl}-1H-1,2,4-triazol-5-yl thiocyanate, (15.129) 5-(allylsulfanyl)-1-{[3-(2-chlorophenyl)-2-(2,4-difluorophenyl)oxiran-2-yl]methyl}-1H-1,2,4-triazole, (15.130) 2-[1-(2,4-dichlorophenyl)-5-hydroxy-2,6,6-trimethylheptan-4-yl]-2,4-dihydro-3H-1,2,4-triazole-3-thione, (15.131) 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, (15.132) 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, (15.133) 1-{[rel(2R,3S)-3-(2-chlorophenyl)-2-(2,4-difluorophenyl)oxiran-2-yl]methyl}-1H-1,2,4-triazol-5-yl thiocyanate, (15.134) 1-{[rel(2R,3R)-3-(2-chlorophenyl)-2-(2,4-difluorophenyl)oxiran-2-yl]methyl}-1H-1,2,4-triazol-5-yl thiocyanate, (15.135) 5-(allylsulfanyl)-1-{[rel(2R,3S)-3-(2-chlorophenyl)-2-(2,4-difluorophenyl)oxiran-2-yl]methyl}-1H-1,2,4-triazole, (15.136) 5-(allylsulfanyl)-1-{[rel(2R,3R)-3-(2-chlorophenyl)-2-(2,4-difluorophenyl)oxiran-2-yl]methyl}-1H-1,2,4-triazole, (15.137) 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, (15.138) 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, (15.139) 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, (15.140) 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, (15.141) 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, (15.142) 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, (15.143)

2-[(2R,4R,5S)-1-(2,4-dichlorophenyl)-5-hydroxy-2,6,6-trimethylheptan-4-yl]-2,4-dihydro-3H-1,2,4-triazole-3-thione, (15.144) 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, (15.145) 2-fluoro-6-(trifluoromethyl)-N-(1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl)benzamide, (15.146) 2-(6-benzylpyridin-2-yl)quinazoline, (15.147) 2-[6-(3-fluoro-4-methoxyphenyl)-5-methylpyridin-2-yl]quinazoline, (15.148) 3-(4,4-difluoro-3,3-dimethyl-3,4-dihydroisoquinolin-1-yl)quinoline, (15.149) Absciscic acid, (15.150) 3-(difluoromethyl)-N-methoxy-1-methyl-N-[1-(2,4,6-trichlorophenyl)propan-2-yl]-1H-pyrazole-4-carboxamide, (15.151) N'-[5-bromo-6-(2,3-dihydro-1H-inden-2-yloxy)-2-methylpyridin-3-yl]-N-ethyl-N-methylimidoformamide, (15.152) N'-{5-bromo-6-[1-(3,5-difluorophenyl)ethoxy]-2-methylpyridin-3-yl}-N-ethyl-N-methylimidoformamide, (15.153) N'-{5-bromo-6-[(1R)-1-(3,5-difluorophenyl)ethoxy]-2-methylpyridin-3-yl}-N-ethyl-N-methylimidoformamide, (15.154) N'-{5-bromo-6-[(1S)-1-(3,5-difluorophenyl)ethoxy]-2-methylpyridin-3-yl}-N-ethyl-N-methylimidoformamide, (15.155) N'-{5-bromo-6-[(cis-4-isopropylcyclohexyl)oxy]-2-methylpyridin-3-yl}-N-ethyl-N-methylimidoformamide, (15.156) N'-{5-bromo-6-[(trans-4-isopropylcyclohexyl)oxy]-2-methylpyridin-3-yl}-N-ethyl-N-methylimidoformamide, (15.157) N-cyclopropyl-3-(difluoromethyl)-5-fluoro-N-(2-isopropylbenzyl)-1-methyl-1H-pyrazole-4-carboxamide, (15.158) N-cyclopropyl-N-(2-cyclopropylbenzyl)-3-(difluoromethyl)-5-fluoro-1-methyl-1H-pyrazole-4-carboxamide, (15.159) N-(2-tert-butylbenzyl)-N-cyclopropyl-3-(difluoromethyl)-5-fluoro-1-methyl-1H-pyrazole-4-carboxamide, (15.160) N-(5-chloro-2-ethylbenzyl)-N-cyclopropyl-3-(difluoromethyl)-5-fluoro-1-methyl-1H-pyrazole-4-carboxamide, (15.161) N-(5-chloro-2-isopropylbenzyl)-N-cyclopropyl-3-(difluoromethyl)-5-fluoro-1-methyl-1H-pyrazole-4-carboxamide, (15.162) N-cyclopropyl-3-(difluoromethyl)-N-(2-ethyl-5-fluorobenzyl)-5-fluoro-1-methyl-1H-pyrazole-4-carboxamide, (15.163) N-cyclopropyl-3-(difluoromethyl)-5-fluoro-N-(5-fluoro-2-isopropylbenzyl)-1-methyl-1H-pyrazole-4-carboxamide, (15.164) N-cyclopropyl-N-(2-cyclopropyl-5-fluorobenzyl)-3-(difluoromethyl)-5-fluoro-1-methyl-1H-pyrazole-4-carboxamide, (15.165) N-(2-cyclopentyl-5-fluorobenzyl)-N-cyclopropyl-3-(difluoromethyl)-5-fluoro-1-methyl-1H-pyrazole-4-carboxamide, (15.166) N-cyclopropyl-3-(difluoromethyl)-5-fluoro-N-(2-fluoro-6-isopropylbenzyl)-1-methyl-1H-pyrazole-4-carboxamide, (15.167) N-cyclopropyl-3-(difluoromethyl)-N-(2-ethyl-5-methylbenzyl)-5-fluoro-1-methyl-1H-pyrazole-4-carboxamide, (15.168) N-cyclopropyl-3-(difluoromethyl)-5-fluoro-N-(2-isopropyl-5-methylbenzyl)-1-methyl-1H-pyrazole-4-carboxamide, (15.169) N-cyclopropyl-N-(2-cyclopropyl-5-methylbenzyl)-3-(difluoromethyl)-5-fluoro-1-methyl-1H-pyrazole-4-carboxamide, (15.170) N-(2-tert-butyl-5-methylbenzyl)-N-cyclopropyl-3-(difluoromethyl)-5-fluoro-1-methyl-1H-pyrazole-4-carboxamide, (15.171) N-[5-chloro-2-(trifluoromethyl)benzyl]-N-cyclopropyl-3-(difluoromethyl)-5-fluoro-1-methyl-1H-pyrazole-4-carboxamide, (15.172) N-cyclopropyl-3-(difluoromethyl)-5-fluoro-1-methyl-N-[5-methyl-2-(trifluoromethyl)benzyl]-1H-pyrazole-4-carboxamide, (15.173) N-[2-chloro-6-(trifluoromethyl)benzyl]-N-cyclopropyl-3-(difluoromethyl)-5-fluoro-1-methyl-1H-pyrazole-4-carboxamide, (15.174) N-[3-chloro-2-fluoro-6-(trifluoromethyl)benzyl]-N-cyclopropyl-3-(difluoromethyl)-5-fluoro-1-methyl-1H-pyrazole-4-carboxamide, (15.175) N-cyclopropyl-3-(difluoromethyl)-N-(2-ethyl-4,5-dimethylbenzyl)-5-fluoro-1-methyl-1H-pyrazole-4-carboxamide,

(15.176) N-cyclopropyl-3-(difluoromethyl)-5-fluoro-N-(2-isopropylbenzyl)-1-methyl-1H-pyrazole-4-carbothioamide, (15.177) 3-(difluoromethyl)-N-(7-fluoro-1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl)-1-methyl-1H-pyrazole-4-carboxamide, (15.178) 3-(difluoromethyl)-N-[(3R)-7-fluoro-1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl]-1-methyl-1H-pyrazole-4-carboxamide, (15.179) 3-(difluoromethyl)-N-[(3S)-7-fluoro-1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl]-1-methyl-1H-pyrazole-4-carboxamide, (15.180) N'-(2,5-dimethyl-4-phenoxyphenyl)-N-ethyl-N-methylimidoforamide, (15.181) N'-{4-[(4,5-dichloro-1,3-thiazol-2-yl)oxy]-2,5-dimethylphenyl}-N-ethyl-N-methylimidoforamide, (15.182) N-(4-chloro-2,6-difluorophenyl)-4-(2-chloro-4-fluorophenyl)-1,3-dimethyl-1H-pyrazol-5-amine.

All named mixing partners of the classes (1) to (15) can, if their functional groups enable this, optionally form salts with suitable bases or acids, in particular in the form of biologically acceptable salts such as sodium, potassium, ammonium and the like.

Regarding insecticides, acaricides and nematocides, the following substances may be used:

1) Acetylcholinesterase (AChE) inhibitors, for example carbamates, e.g. 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, e.g. Acephate, Azamethiphos, Azinphos-ethyl, Azinphos-methyl, Cadusafos, Chlorethoxyfos, Chlorfenvinphos, Chlormephos, Chlorpyrifos, Chlorpyrifos-methyl, Coumaphos, Cyanophos, Demeton-S-methyl, Diazinon, Dichlorvos/DDVP, Dicrotophos, Dimethoate, Dimethylvinphos, Disulfoton, EPN, Ethion, Ethoprophos, Famphur, Fenamiphos, Fenitrothion, Fenthion, Fosthiazate, Heptenophos, Imicyafos, Isafenphos, Isopropyl O-(methoxyaminothiophosphoryl)salicylate, Isoxathion, Malathion, Mecarbam, Methamidophos, Methidathion, Mevinphos, Monocrotophos, Naled, Omethoate, Oxydemeton-methyl, Parathion, Parathion-methyl, Phenthoate, Phorate, Phosalone, Phosmet, Phosphamidon, Phoxim, Pirimiphos-methyl, Profenofos, Propetamphos, Prothiofos, Pyraclofos, Pyridaphenthion, Quinalphos, Sulfotep, Tebupirimfos, Temephos, Terbufos, Tetrachlorvinphos, Thiometon, Triazophos, Trichlorfon and Vamidothion.

2) GABA-gated chloride channel antagonists, for example cyclodiene organochlorines, e.g. Chlordane and Endosulfan or phenylpyrazoles (fiproles), e.g. (16.1) Ethiprole and (16.2) Fipronil.

3) Sodium channel modulators / voltage-dependent sodium channel blockers, for example pyrethroids, e.g. 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 isomers], Deltamethrin, Empenthrin [(EZ)-(1R) isomers], Esfenvalerate, Etofenprox, Fenpropathrin, Fenvalerate, Flucythrinate, Flumethrin, tau-Fluvalinate, Halfenprox, Imiprothrin, Kadethrin, Permethrin, Phenothrin [(1R)-trans isomer],

Prallethrin, Pyrethrin (pyrethrum), Resmethrin, Silafluofen, Tefluthrin, Tetramethrin, Tetramethrin [(1R) isomers)], Tralomethrin and Transfluthrin or DDT or Methoxychlor.

- 4) Nicotinic acetylcholine receptor (nAChR) agonists, for example neonicotinoids, e.g. (17.1) Acetamiprid, (17.2) Clothianidin, (17.3) Dinotefuran, (17.4) Imidacloprid, (17.5) Nitenpyram, (17.6) Thiachloprid and (17.7) Thiamethoxam or (17.8) Nicotine or (17.9) Sulfoxaflor.
- 5) Nicotinic acetylcholine receptor (nAChR) allosteric activators, for example spinosyns, e.g. (18.1) Spinetoram and (18.2) Spinosad.
- 6) Chloride channel activators, for example avermectins/milbemycins, e.g. Abamectin, Emamectin benzoate, Lepimectin and Milbemectin.
- 10 7) Juvenile hormone mimics, for example juvenile hormone analogues, e.g. Hydroprene, Kinoprene and Methoprene or Fenoxycarb or Pyriproxyfen.
- 8) Miscellaneous non-specific (multi-site) inhibitors, for example alkyl halides, e.g. Methyl bromide and other alkyl halides; or Chloropicrin or Sulfuryl fluoride or Borax or Tartar emetic.
- 9) Selective homopteran feeding blockers, e.g. Pymetrozine or Flonicamid.
- 15 10) Mite growth inhibitors, e.g. Clofentezine, Hexythiazox and Diflovidazin or Etoxazole.
- 11) Microbial disruptors of insect midgut membranes, e.g. *Bacillus thuringiensis* subspecies *israelensis*, *Bacillus sphaericus*, *Bacillus thuringiensis* subspecies *aizawai*, *Bacillus thuringiensis* subspecies *kurstaki*, *Bacillus thuringiensis* subspecies *tenebrionis* and BT crop proteins: Cry1Ab, Cry1Ac, Cry1Fa, Cry2Ab, mCry3A, Cry3Ab, Cry3Bb, Cry34/35Ab1.
- 20 12) Inhibitors of mitochondrial ATP synthase, for example Diafenthiuron or organotin miticides, e.g. Azocyclotin, Cyhexatin and Fenbutatin oxide or Propargite or Tetradifon.
- 13) Uncouplers of oxidative phosphorylation via disruption of the proton gradient, for example Chlorfenapyr, DNOC and Sulfluramid.
- 14) Nicotinic acetylcholine receptor (nAChR) channel blockers, for example Bensultap, Cartap hydrochloride, Thiocyclam and Thiosultap-sodium.
- 25 15) Inhibitors of chitin biosynthesis, type 0, for example Bistrifluron, Chlorfluazuron, Diflubenzuron, Flucycloxuron, Flufenoxuron, Hexaflumuron, Lufenuron, Novaluron, Noviflumuron, Teflubenzuron and Triflumuron.
- 16) Inhibitors of chitin biosynthesis, type 1, for example Buprofezin.

17) Moulting disruptors, for example Cyromazine.

18) Ecdysone receptor agonists, for example Chromafenozide, Halofenozide, Methoxyfenozide and Tebufenozide.

19) Octopamine receptor agonists, for example Amitraz.

5 20) Mitochondrial complex III electron transport inhibitors, for example Hydramethylnon or Acequinocyl or Fluacrypyrim.

21) Mitochondrial complex I electron transport inhibitors, for example METI acaricides, e.g. Fenazaquin, Fenpyroximate, Pyrimidifen, Pyridaben, Tebufenpyrad and Tolfenpyrad or Rotenone (Derris).

22) Voltage-dependent sodium channel blockers, e.g. Indoxacarb or Metaflumizone.

10 23) Inhibitors of acetyl CoA carboxylase, for example tetronic and tetramic acid derivatives, e.g. Spirodiclofen, Spiromesifen and Spirotetramat.

24) Mitochondrial complex IV electron transport inhibitors, for example phosphines, e.g. Aluminium phosphide, Calcium phosphide, Phosphine and Zinc phosphide or Cyanide.

25) Mitochondrial complex II electron transport inhibitors, for example Cyenopyrafen and Cyflumetofen.

15 28) Ryanodine receptor modulators, for example diamides, e.g. (19.1) Chlorantraniliprole, (19.2) Cyantraniliprole and (19.3) Flubendiamide.

Further active ingredients with unknown or uncertain mode of action, for example Afidopyropen, Azadirachtin, Benclothiaz, Benzoximate, Bifenazate, Bromopropylate, Chinomethionat, Cryolite, Dicofol, Diflovidazin, Fluensulfone, Flometoquin, Flufenerim, Flufenoxystrobin, Flufiprole, Fluopyram, Flupyradifurone, Fufenozide, Heptafluthrin, Imidaclothiz, Iprodione, Meperfluthrin, Paichongding, Pyflubumide, Pyrfluquinazon, Pyriminostrobin, Tetramethylfluthrin and Iodomethane; furthermore products based on *Bacillus firmus* (including but not limited to strain CNCM I-1582, such as, for example, VOTiVO™, BioNem) or one of the following known active compounds:

25 3-bromo-N-{2-bromo-4-chloro-6-[(1-cyclopropylethyl)carbamoyl]phenyl}-1-(3-chloropyridin-2-yl)-1H-pyrazole-5-carboxamide (known from WO2005/077934) and 1-{2-fluoro-4-methyl-5-[(2,2,2-trifluorethyl)sulfinyl]phenyl}-3-(trifluoromethyl)-1H-1,2,4-triazol-5-amine (known from WO2006/043635), {1'-[(2E)-3-(4-chlorophenyl)prop-2-en-1-yl]-5-fluorospiro[indole-3,4'-piperidin]-1(2H)-yl}(2-chloropyridin-4-yl)methanone (known from WO2003/106457), 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), 3-(2,5-dimethylphenyl)-4-hydroxy-8-methoxy-1,8-diazaspiro[4.5]dec-3-en-2-one (known from WO2009/049851), 3-(2,5-dimethylphenyl)-8-methoxy-2-oxo-1,8-diazaspiro[4.5]dec-3-en-4-yl ethyl carbonate (known from WO2009/049851), 4-(but-2-yn-1-yloxy)-6-(3,5-dimethylpiperidin-1-

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yl)-5-fluoropyrimidine (known from WO2004/099160), 4-(but-2-yn-1-yloxy)-6-(3-chlorophenyl)pyrimidine (known from WO2003/076415), PF1364 (CAS-Reg.No. 1204776-60-2), 4-[5-(3,5-dichlorophenyl)-5-(trifluoromethyl)-4,5-dihydro-1,2-oxazol-3-yl]-2-methyl-N-{2-oxo-2-[(2,2,2-trifluoroethyl)amino]ethyl}benzamide (known from WO2005/085216), 4-{5-[3-chloro-5-(trifluoromethyl)phenyl]-5-(trifluoromethyl)-4,5-dihydro-1,2-oxazol-3-yl}-N-{2-oxo-2-[(2,2,2-trifluoroethyl)amino]ethyl}-1-naphthamide (known from WO2009/002809), methyl 2-[2-({[3-bromo-1-(3-chloropyridin-2-yl)-1H-pyrazol-5-yl]carbonyl}amino)-5-chloro-3-methylbenzoyl]-2-methylhydrazinecarboxylate (known from WO2005/085216), methyl 2-[2-({[3-bromo-1-(3-chloropyridin-2-yl)-1H-pyrazol-5-yl]carbonyl}amino)-5-cyano-3-methylbenzoyl]-2-ethylhydrazinecarboxylate (known from WO2005/085216), methyl 2-[2-({[3-bromo-1-(3-chloropyridin-2-yl)-1H-pyrazol-5-yl]carbonyl}amino)-5-cyano-3-methylbenzoyl]-2-methylhydrazinecarboxylate (known from WO2005/085216), methyl 2-[3,5-dibromo-2-({[3-bromo-1-(3-chloropyridin-2-yl)-1H-pyrazol-5-yl]carbonyl}amino)benzoyl]-2-ethylhydrazinecarboxylate (known from WO2005/085216), 1-(3-chloropyridin-2-yl)-N-[4-cyano-2-methyl-6-(methylcarbamoyl)phenyl]-3-{[5-(trifluoromethyl)-2H-tetrazol-2-yl]methyl}-1H-pyrazole-5-carboxamide (known from WO2010/069502), N-[2-(5-amino-1,3,4-thiadiazol-2-yl)-4-chloro-6-methylphenyl]-3-bromo-1-(3-chloropyridin-2-yl)-1H-pyrazole-5-carboxamide (known from CN102057925), 3-chloro-N-(2-cyanopropan-2-yl)-N-[4-(1,1,1,2,3,3,3-heptafluoropropan-2-yl)-2-methylphenyl]phthalamide (known from WO2012/034472), 8-chloro-N-[(2-chloro-5-methoxyphenyl)sulfonyl]-6-(trifluoromethyl)imidazo[1,2-a]pyridine-2-carboxamide (known from WO2010/129500), 8-chloro-N-[(2-chloro-5-methoxyphenyl)sulfonyl]-6-(trifluoromethyl)imidazo[1,2-a]pyridine-2-carboxamide (known from WO2009/080250), N-[(2E)-1-[(6-chloropyridin-3-yl)methyl]pyridin-2(1H)-ylidene]-2,2,2-trifluoroacetamide (known from WO2012/029672), 1-[(2-chloro-1,3-thiazol-5-yl)methyl]-4-oxo-3-phenyl-4H-pyrido[1,2-a]pyrimidin-1-ium-2-olate (known from WO2009/099929), 1-[(6-chloropyridin-3-yl)methyl]-4-oxo-3-phenyl-4H-pyrido[1,2-a]pyrimidin-1-ium-2-olate (known from WO2009/099929), (5S,8R)-1-[(6-chloropyridin-3-yl)methyl]-9-nitro-2,3,5,6,7,8-hexahydro-1H-5,8-epoxyimidazo[1,2-a]azepine (known from WO2010/069266), (2E)-1-[(6-chloropyridin-3-yl)methyl]-N'-nitro-2-pentylidenehydrazinecarboximidamide (known from WO2010/060231), 4-(3-{2,6-dichloro-4-[(3,3-dichloroprop-2-en-1-yl)oxy]phenoxy}propoxy)-2-methoxy-6-(trifluoromethyl)pyrimidine (known from CN101337940), N-[2-(tert-butylcarbamoyl)-4-chloro-6-methylphenyl]-1-(3-chloropyridin-2-yl)-3-(fluoromethoxy)-1H-pyrazole-5-carboxamide (known from WO2008/134969).

Although the agrochemical or agrochemicals can be selected independently from the substances mentioned above and also combined in any possible way, it is preferred that at least one agrochemical is selected from isotianil, sedaxane, penflufen, azole fungicides, in particular tebuconazole, ipconazole, propiconazole or difenoconazole, strobilurins, in particular trifloxystrobin, azoxystrobin or picoxystrobin, penthiopyrad, metalaxyl, fludioxonil, tiadinil, fipronil, flubendiamide, chlorantraniliprol, cyantraniliprole, imidacloprid, thiacloprid, thiamethoxam, clothianidin, spinosad, ethiprole or mixtures

thereof, preferably a combination of isotianil and trifloxystrobin, isotianil and penflufen, penflufen and trifloxystrobin or isotianil and acetamiprid. Particularly preferred is isotianil. These agrochemicals are particularly preferred for the inventive coating of rice seed as fit to the rice-specific diseases and pests and because the inventive copolymer effectively prevents wash-off of these substances from the coated seed.

The seed coating may further comprise at least one colorant, a surfactant, an organic solvent and/ or a further polymer or copolymer. Adding a colorant, like red, green, blue or the like, has the advantage that it is obvious to everyone that the rice seed is treated so the danger that the coated rice is unintentionally used for food purposes is drastically reduced. Furthermore, the colorant may indicate that the coating remains on the seed during soaking and incubation. The colorant could for example be chosen not only by its color but also by its bleeding behavior from the coating in so far that it is similar to the agrochemicals used in the coating. Thus, the applicant may actually see that coating wash-off practically does not occur. In this context, the colorant may be used as semi-quantitative benchmark for the bleeding behavior, for example by comparison of the color of the seeds before and after soaking with color tables which indicate the relation between color and agrochemical content. For the purpose of color intensity before and after soaking, also spectroscopic methods may be used. Furthermore, the colorant can also indicate quality of coating showing with respect to coating evenness across or between all seeds.

The colorant used may be of visible color or also a UV-dye. If an inorganic colorant is used, it may at the same time work as a source of trace elements.

The coating may have any structure or layer sequence possible. According to one preferred embodiment, the copolymer and the agrochemical are mixed before being applied to the seed, whereas in particular the coated rice seed is then treated with a further agrochemical, preferably with an insecticide. The agrochemical mixed with the copolymer is favorable a fungicide.

Alternatively, the copolymer and the agrochemical can be applied to the seed in sequential manner, whereas preferably the seed is coated first with at least one agrochemical and then with the copolymer.

The application rate of the copolymer may vary in broad ranges. The application rate is for example 0,001 to 2,5 wt.-% in relation to the weight of the untreated seed, in particular 0,01 to 1,25 wt.-%, preferably 0,025 to 1 wt.-%.

The application rate of the agrochemical mainly depends on the dosage requirement and can be adopted by the skilled person. Just to give an example, the application rate of the agrochemical is 0,001 to 5 wt.-% in relation to the weight of the untreated seed, in particular 0,01 to 2,5 wt.-%, preferably 0,05 to 1 wt.-%. To give non-limiting examples for specific fungicides, the application rate of isotianil may be chosen from 0,05 to 2 wt.-%, in particular from 0,1 to 1 wt.-% and the application rate of trifloxystrobin may be

chosen from 0,01 to 1 wt.-%, in particular from 0,05 to 0,5 wt.-%, each in relation to the weight of the untreated seed.

The agrochemical may be used in any available form or formulation, for example as a solid, for example a (wetttable) powder, water-soluble formulations, liquid formulations, applicable liquids, aqueous suspensions, dispersions or emulsions, microcapsule preparations, just to give a few examples. The formulations can be obtained by known methods, for example by mixing the agrochemical with developers, that is, liquid or solid diluents or carriers, and, in some cases, with surfactants, that is, emulsifiers and/or dispersants. In the case water is used as a developing agent, organic solvents, for example, can be used as auxiliary solvents.

- 10 In the present invention, aqueous suspensions of the agrochemical are preferable from workability point of view. As an aqueous suspension agent, aqueous suspension compositions comprising water, surfactants, liquid diluents (organic solvents), and polymer resins, especially acryl resins ((co)polymer resin comprising of acrylic acid alkyl esters and/or methacrylic acid alkyl esters) besides the agrochemical are particularly preferable from the viewpoint of durability of the effect.
- 15 Antifoaming agents, antiseptics, thickening agents, dispersants, antifreezing agents, and the like can be added to said aqueous suspension of the agrochemical as needed. The preferred agrochemical content in the aqueous suspension composition is from 1 to 50 wt.-%, particularly from 5 to 40 wt.-%. The preferred surfactant content is from 0.01 to 10 wt.-%, particularly 0.1 to 5 wt.-%. The preferred diluent content is from 1 to 50 wt.-%, particularly 5 to 30 wt.-%. The preferred acrylic resin content is from 0.1 to 20 wt.-%, particularly from 1 to 10 wt.-%. For other added ingredients such as antifoaming agents, antiseptics and thickening agents, the preferred total content is from 0 to 10 wt.-%, particularly from 0.1 to 5 wt.-%. A granular polymer resin is preferred as the polymer resin in the aqueous suspension composition and those that are finely pulverized by grinding, and the like is particularly preferred.

- 25 As the examples of liquid diluents or carriers, there may be mentioned aromatic hydrocarbons (for example, xylene, toluene, alkyl naphthalene, and the like), chlorinated aromatics or chlorinated aliphatic hydrocarbons (for example, chlorobenzenes, ethylene chlorides, methylene chlorides, and the like), aliphatic hydrocarbons [for example, cyclohexane, and the like, paraffins (for example, mineral oil fractions, and the like)], alcohols (for example, C₂₋₁₀ alcohols such as butanol, ethylene glycol, glycols such as propylene glycol, and the like, and their ethers, esters and the like), ketones (for example, 30 acetone, methyl ethyl ketone, methyl isobuthyl ketone, cyclohexanone, and the like), strongly polar solvents (for example, dimethylformamide, dimethyl sulfoxide, and the like), water, and the like.

- As the examples of solid diluents or carriers, there may be mentioned crushed natural minerals (for example, kaolin, clay, talc, chalk, quartz, attapulgite, montmorillonite, diatom earth, and the like), crushed synthetic minerals (for example, bentonite, silicic acid, alumina, silicate, silica sand, and the like), and the like. As the examples of solid carriers for granular formulations, there may be mentioned
- 35

crushed and sorted rocks (for example, calcite, marbles, pumice stones, meerschaum, dolomite, and the like), synthetic granules of inorganic and organic powders, fine grains, and the like of organic substances (for example, sawdusts, coconut shells, corncobs, tobacco stems, and the like).

5 As the examples of surfactants, there may be mentioned non-ionic and anionic surfactants [for example, polyoxyethylene fatty acid esters, polyoxyethylene fatty acid alcohol ethers (for example, alkyl aryl polyglycol ether, alkyl sulfonate, alkyl sulfate, arylsulfonate), tristyrylphenols and their ethoxylates], albumin hydrolysates, and the like.

As the examples of dispersants, there may be included lignin-sulfite waste liquors, methyl cellulose, and the like.

10 Adhesive agents can also be added to the formulations (powder formulations, granular formulations, emulsions), and as the examples of said adhesive agents there may be mentioned carboxy methyl cellulose, natural and synthetic polymers (for example, gum Arabic, polyvinyl alcohols, polyvinyl acetates, and the like).

15 Coloring agents can also be used in the formulation, and as the examples of said coloring agents there may be mentioned inorganic pigments (for example, iron oxides, titanium oxides, Prussian blues, and the like), and organic dyes such as alizarin dyes, azo dyes and metal phthalocyanine dyes, as well as trace elements such as metal salts of iron, manganese, boron, copper, cobalt, molybdenum, zinc, and the like.

20 There are no particular restrictions to the methods for providing the inventive coating to rice seeds. The compositions of the coating may be in liquid form but it is also possible that the agrochemical is in solid form and the copolymer is in liquid form. In such a case, the agrochemical can be brought onto the seed surface by any powder coat method, followed by any liquid coating method for the copolymer. The coating can be applied in one step, but also in two steps or more, if further coating layers are to be applied.

25 As the method of powder-coating, for example, there is a method, wherein rice seeds and the agrochemical are put in a rotary drum and the rice seeds are coated homogeneously with the agrochemical by rotating the drum. As the methods for spraying the agrochemical, the copolymer or a mixture of both, there are, for example, (1) a method, wherein the agrochemical, the copolymer or a mixture of both is directly sprayed to the rice seeds falling from a hopper and the like by using an appropriate nozzle, (2) a method, wherein a vibrating guide plate is attached from a hopper to a nursery
30 box, and the rice seeds are sprayed with the agrochemical, the copolymer or a mixture of both using an appropriate nozzle when the rice seeds pass bouncing on the plate, and (3) a method, wherein a drum, through which the rice seeds pass, is installed between a hopper and above a nursery box, and the agrochemical, the copolymer or a mixture of both is sprayed to the rice seeds passing through the drum.

As a method for spraying the agrochemical, the copolymer or a mixture of both to the rice seeds in a small scale, a method, wherein the rice seeds are put into a rotating machine like a mortar mixer, and a predetermined dose of the agrochemical, the copolymer or a mixture of both is homogeneously sprayed to the rice seeds with an appropriate sprayer, can also be used. And also, a method, wherein the rice seeds are put into a plastic bag or an appropriate container with twice to three times the volume of the rice seeds, and after the agrochemical, the copolymer or a mixture of both is added, it is closed (for a plastic bag, the entrance of the bag is closed after the inside of the bag is filled with air so that the whole bag is inflated), shook and stirred so that the agrochemical, the copolymer or a mixture of both spreads inside the whole container or the bag, can also be used.

- 10 In the case of spraying a large amount of rice seeds, it is possible to install a spray nozzle in the midst of the transporting means leading to a sowing machine for nursery boxes to spray the agrochemical, the copolymer or a mixture of both. This can be followed by a mixing step and an optional drying step.

A further embodiment of the present invention is a rice seed treatment agent, characterized in that the treatment agent comprises

- 15 an ethylene-vinylacetate copolymer and
at least one agrochemical.

The rice seed treatment agent may have any modification as set above regarding the inventive method without exception.

- 20 Yet a further embodiment of the present invention is a coated rice seed being at least partially coated with the inventive rice seed treatment agent.

- As set out above, the inventive coating protects the seed from disease and pest without major impact on the germination rate. Hence, the typical preparation of the rice seed known to the applicant comprising soaking in water and incubation before sowing can be maintained. Preferably, the coated rice seed of this invention shows an average germination rate reduction of 0 to 10 % after soaking the rice seed in water at 25°C followed by incubating the soaked rice seed at 7°C for 144 hours (6 days) compared to untreated rice seed of the same variety and age, preferably 0 to 5 %. Soaking of the seed is carried out for example by spreading 30 seeds over a tissue paper and spraying 50 mL of water over the paper. The paper is then rolled up and put into a closed jar and exposed to the above-mentioned temperature and humidity conditions in the dark, for example in a refrigerator. The germination tests are carried out under the test conditions explained above, whereas the evaluation is made by counting at least 30 seeds, randomly chosen. This test is made with at least three samples, soaked and incubated in different containers and the average germination rate is calculated.

Furthermore, the coated rice seed can be stored without significant reduction of germination rate and/or activity loss of the agrochemical(s) for several months.

The coated rice seed of the present invention allows soaking in water without substantial loss of the agrochemical by wash-off or bleeding. This, in a preferred embodiment of the invention, the coated rice seed shows a release rate of the agrochemical during soaking of the rice seed in water at 25°C for 24h without agitation of 5 wt.-% or less compared to the total weight of that agrochemical in the coating, in particular 3 wt.-% or less. The agrochemical is in particular selected from fungicides.

Another embodiment of this invention is a method for protecting emerging seedlings of rice plants against fungal diseases and/ or pests before planting, the method comprising the steps of:

- 10 a. Soaking the coated rice seed according to the present invention in water, in particular for at least 12 hours, preferably at a temperature of 10 to 40 °C, more preferred at 20 to 30 °C and
- b. if desired, incubating the soaked rice seed for at least 36 hours, in particular for at least 72 hours,

wherein optionally at least one further agrochemical is applied to the rice seed during soaking and/ or incubating and wherein the further agrochemical is in particular an insecticide, preferably thiamethoxam, imidacloprid, clothianidin or mixtures thereof. By this method, it is possible to adjust the protection profile to the actual requirements, for example, if a danger of insect pest is eminent. The rice seed may be sowed after soaking or the optional incubation step in nursery boxes (for example with a size of 60 cm × 30 cm × 3 cm), for example. However, it is also in the range of the present invention that the rice seed is directly seeded in-field after soaking for cultivation or into in-field nursery systems for later transplantation.

There are in principle no restrictions concerning soaking methods of rice seeds and it is preferred in the above described method for protecting emerging seedlings to have rice seeds absorb enough water with accumulated temperature of 60 to 140 °C · days (for example, from 7 to 10 days at 13 to 14 °C).

- 25 Incubation can be carried out for at least 24 hours, preferably for at least 72 or even 132 hours, at 20 to 40°C, preferably at 25 to 35°C, after soaking, for example.

Methods for raising seedlings of rice after rice seeds are sowed in nursery boxes and covered with soil, transplantation of seedlings to rice paddies and the raising of rice after transplantation are not restricted in particular, and a commonly known method can be adopted. For example, after covering the seeds with soil, each nursery box is put in a nursery cabinet and the seeds are germinated, and then, nursery boxes are moved to a nursery house, and are further raised. It is only necessary to transplant the raised seedlings in rice paddies by using a cultivator, and the like. There are also no restrictions concerning the

raising methods of rice after transplanted to the rice paddies, and rice can be raised in accordance with conventional methods.

The inventive coating typically allows a longer lasting protection compared to the seed directly coated with the respective agrochemical while requiring a lower amount of agrochemicals. For example, in the
5 inventive method for protecting emerging seedlings of rice plants, the disease and/ or pest protection may still be observed at 50 or more days after transplantation of the soaked and incubated seed, in particular at 60 or more days. A typical disease against which protection is achieved, is caused by filamentous fungi and/or microorganisms. The disease is particularly selected from rice blast (caused by *Pyricularia oryzae*), rice brown spot or rice head blight (caused by *Cochliobolus miyabeanus*), rice
10 sheath blight (caused by *Rhizoctonia solani*), rice bacterial leaf blight (caused by *Xanthomonas oryzae* pv. *oryzae*), rice bacterial grain rot (caused by *Burkholderia glumae*) or combinations thereof.

In a further aspect of the inventive method for protecting emerging seedlings, the pest is an animal pest, which is in particular selected from *Lissorhoptrus oryzophilus*, *Oulema oryzae* Kuwayama, *Delphacidae*, *Nephotettix cincticeps*, *Hydrellia griseola* (rice leaf miner), *Parnara guttata* (rice skipper),
15 *Naranga aenescens* Moore, *Cnaphalocrocis medinalis*, *Chilo suppressalis*, *Stenchaetothrips biformis* (rice thrips) or combinations thereof.

The present invention will further be explained on the basis of the following example.

Substances used:

Agrochemical formulation:

20 As agrochemical, a water-based formulation containing isotianil (200 g/L) and trifloxystrobin (80 g/L) was used. The formulation had an overall water content of about 60 wt.-% and further contained 2,5 wt.-% of a mixture of a red pigment as well as further additives like defoamers, thickeners and the like. This is further referred to as “agrochemical formulation” in the following.

Copolymer:

25 As copolymer, a non-plasticized aqueous copolymer dispersion was used:

Atlox™ 1656 Product from Croda Crop Care, non-plasticised aqueous copolymer dispersion based on the following monomers

Monomer ACAS no. 108-05-4, vinyl acetate

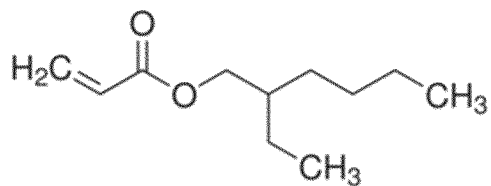
$C_4H_6O_2$, $AcO-CH=CH_2$

30 35 - 50 %

Monomer B

CAS no. 103-11-7, 2-Ethylhexyl acrylate

C₁₁H₂₀O₂



- 5 25 - 55 % soft (meth)acrylic monomer

Monomer C

CAS no. 74-85-1, *ethylene*

CH₂=CH₂

5 - 25 %

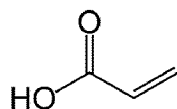
- 10 Percentiles of monomers A+B+C add up to 100 %.

In addition, although this copolymer itself doesn't contain acrylic acid, the product does as it may be added as part of the synthesis.

Monomer D

CAS no. 79-10-7, acrylic acid

- 15 C₃H₄O₂



Present at 0 - 5% of the total product, i.e. in the copolymer dispersion.

- 20 Acrylic acid may be added initially to start the polymerization reaction. This acrylic acid does not form part of the copolymer, but does remain in the product and is therefore present as monomer and acrylic acid polymer – distinct from the copolymer.

The copolymer dispersion has a solid content of around from 59 to 61 wt.% (DIN EN ISO 3251; 30 mins; 130 °C).

The Tg of the polymer as produced is -30°C. The dispersion neither contains a plasticizer nor alkylphenolethoxylate.

Brookfield Viscosity (DIN EN ISO 2555; RVT; spindle no. 4; 20 rpm, 25°C) - Lower limit - 2,000 mPa·s, Upper limit - mPa·s 10,000 mPa·s.

5 **pH value** (DIN ISO 976; 1:1 with water) - Lower limit - 4.5, Upper limit - 6.5.

Particle size in dispersion - Lower limit - 0.2 µm, Upper limit - 2.0 µm determined by Laser-Aerosol-Spectroscopy with a Nd:YVO4 Laser (Millenii II) with 2W / 532 nm and a Bialkali Photocathode Type 4517 (Fa. Burle) on spray dried particles at an angle of 40° (calculated in a range from 80nm to 550 nm).

Minimum film forming temperature (MFFT) (DIN ISO 2115) - 0°C

10 Experiments:

Preparation of the seed treatment formulations:

The following inventive and comparative seed treatment formulations were prepared:

Exp.	Copolymer Dispersion	Mass of Dispersion / (g)	Agrochemical formulation added* (mL)/ (g)	Demin. Water (g)	Wt.-% dispersion in coating composition
1 (inv.)	Atlox 1656	1.05	9/ 10.01	—	9
2 (inv.)	Atlox 1656	0.50	9/ 10.01	0.50	9
3 (comp.)	None	—	2.25/ 2.51	0.25	0

*9 mL of the supplied formulation was determined to correspond to 10.05 g in mass.

Table 1: Seed Treatment Formulations

15 In order to obtain the seed treatment formulations, the polymer dispersion was added to a 60 mL jar and the agrochemical formulation was added. The mixture was subjected to high shear mixing on an IKA Ultra Turrax for 2 min, at 9500 rpm and afterwards rolled for 30 min. before use.

Seed treatment

In order to prepare coated rice seed, 1.00 g of the seed treatment formulations were added to 50.0 g of rice seeds in baffled flasks and rolled for 30 min at room temperature in order to spread the coating evenly over the seed surface. The application rate is equivalent to 20g/kg of dry rice seeds, based on the liquid seed treatment formulations. “Dry” means in that context, that the seed has a rest water content typical for rice seed, for example 14 wt.-% or less. As the seed treatment formulations is highly red in color, the uniform coating can be observed by the naked eye. Furthermore, the flask surface is mostly free from red color, which indicates that the seed treatment formulation adheres stronger to the seed than to glass. Afterwards, the seeds were spread on tablets and dried at room temperature for one day.

10 HPLC Determination of release of agrochemical in wash-off-water

In order to determine the adherence of the agrochemical to the rice seed, the coated and dried seeds were objected to soaking in water and incubation preparation, which is a typical method before sowing. During this procedure, samples of the soaking water were collected at fixed time points and analysed by HPLC with respect to its contents regarding isotianil and trifloxystrobin. .

- 15 The concentration that corresponds to theoretical maximum release (100 wt.-%) is calculated to be 720 µg/mL and 288 µg/mL for isotianil and trifloxystrobin respectively and the release rate of the substances were related to these amounts.

The inventive examples 1 and 2 including the copolymer dispersion and the comparative example 3 showed the following release of isotianil and trifloxystrobin after 48 h

20	Example 1:	0.2 wt.-% isotianil;	0.8 wt.-% trifloxystrobin
	Example 2:	0.6 wt.-% isotianil;	1.3 wt.-% trifloxystrobin
	Example 3:	6.5 wt.-% isotianil;	11.8 wt.-% trifloxystrobin

- 25 The comparison between Examples 1 and 2 indicates that decreasing the copolymer concentration by 50 wt.-% increased the release of isotianil from 0.3 to 0.6% after 48 h and trifloxystrobin from 1.0 to 1.3% after 48 h which corresponds to an increase in total active ingredient concentration from 5.3 to 8.0 µg/mL.

Germination testing

Germination testing was also carried out. An amount of 30 to 40 rice seeds are spread over a tissue paper and 50 mL of water over is sprayed on the paper. The paper is then rolled up and put into a closed jar and exposed to 7 °C and a relative humidity of about 55%. Incubation is carried out for 144 hours (6 days) and the seeds are grouped into the germination stages “no germination” “marginal germination (sprout or root < 1 cm)”, “roots only (sprout 5 mm)” and “firm root and sprout” by the human eye.

The % germination results from the testing of triplicate samples for each candidate are summarized in table 3 below:

Sample	% Germination - Germination			
	Stage			
	1. No germination	2. Marginal (sprout or root <1cm)	3. Roots only (sprout < 5mm)	4. Firm root & sprout
Untreated control	5.5	12.8	4.6	77.1
Exp. 1 (inv.)	3.4	25.6	7.7	63.2
Exp. 2 (inv.)	6.6	19.0	10.7	63.6
Exp. 3 (comp.)	0.9	17.5	17.5	64.0

Table 3: Percentage of seeds present in stages 1-4 of germination

- 10 The percentage of seeds in stages 1-3 germination for all batches of treated seeds was similar to the untreated control. Germination for all batches of treated seeds in stage 4 was slightly lower compared to the untreated control (sample 1). The experiments show however that no significant difference can be seen by comparing the inventive examples 1 and 2 to comparative example 3.

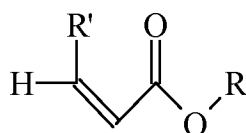
Conclusion

- 15 The two inventive (Exp. 1 and 2) and one comparative (Exp. 3) examples show that the inventive coating (i) has no negative effect on germination and (ii) is robust and has improved wash-off resistance. The inventive seed coating formulations are stable and can be easily applied to the seed surface without leaving major remains on the mixing machinery parts.

Claims

1. A method for preparing a coated rice seed wherein a seed coating is at least partially applied to the surface of dry rice seed, characterized in that the seed coating comprises at least an ethylene-vinylacetate copolymer and at least one agrochemical.
2. The method according to claim 1, characterized in that the copolymer is prepared by reacting at least the following monomers:

- a. Vinyl acetate,
- b. a (meth)acrylic monomer of the general formula (I)



(formula I),

- wherein R is a saturated or unsaturated organic radical having at least 3 carbon atoms and R' is Hydrogen or a methyl group, and
- c. ethylene.
3. The method according to claim 2, characterized in that the copolymer is prepared from at least:
 - a. 35 to 50 wt.-% vinyl acetate, in particular 38 to 48 wt.-%, preferably 40 to 45 wt.-%,
 - b. 25 - 55 % wt.-% (meth)acrylic monomer of the general formula (I), in particular 30 to 50 wt.-%, preferably 35 to 45 wt.-%,,
 - c. 5 to 25 wt.-% ethylene, in particular 10 to 25 wt.-%, preferably 15 to 23 wt.-%, and
 - d. 0 to 5 wt.-% acrylic acid, in particular 0,1 to 4,5 wt.-%, preferably 0,5 to 4,0 wt.-%,.
4. The method according to claim 2 or 3, characterized in that R has 4 to 15 carbon atoms, in particular 5 to 10 and is preferably selected from n-butyl, n-pentyl, n-hexyl, cyclohexyl, isoheptyl, n-nonyl, n-decyl, isohexyl, isobornyl, 2-ethyloctyl, isooctyl, 2-ethylhexyl, tetrahydrofurfuryl, ethoxyethoxyethyl, phenoxyethyl, cyclic trimethylpropane formal, 3,3,5-trimethylcyclohexyl, t-butylcyclohexyl and/or t-butyl.
5. The method according to any of the preceding claims, characterized in that the copolymer is an ethylene-2-ethylhexyl acrylate-vinyl acetate copolymer.

6. The method according to any of the preceding claims, characterized in that the copolymer has a glass transition temperature T_g of -60 to 20 °C, measured by dynamic differential scanning calorimetry according to DIN 53 765 with a heating rate of 20 K/min and a definition of T_g as midpoint temperature using the tangent method and nitrogen as inert gas, whereas T_g is in particular
5 -10 °C or less, preferably -20 °C or less.
7. The method according to any of the preceding claims, characterized in that the copolymer is applied to the seed in the form of a dispersion, in particular in the form of a water based dispersion, whereas the rice seed is dried after the coating is applied.
8. The method according to claim 7, characterized in that the dispersion has a Brookfield Viscosity of
10 $1,000$ to $30,000$ mPa·s, measured according to DIN EN ISO 2555, RVT, spindle no. 4, at 20 rpm and 25 °C, in particular from $1,500$ to $20,000$ mPa·s, preferably from $2,000$ to $10,000$ mPa·s.
9. The method according to claim 7 or 8, characterized in that the dispersion has a solids content of 30 to 80 wt.-%, measured according to DIN EN ISO 3251, 30 mins, at 130 °C, in particular from 50 to 70 wt.-%, preferably from 55 to 65 wt.-%.
- 15 10. The method according to any of the claims 7 to 9, characterized in that the dispersion has a pH value of 4 to 7 , measured according to DIN ISO 976 in a $1:1$ mixture with water, in particular from 4.5 to 6.5 .
11. The method according to any of the claims 7 to 10, characterized in that the dispersion has an average particle size d_{50} of 0.1 to 5 μm , in particular from 0.2 to 2.0 μm .
- 20 12. The method according to any of the claims 7 to 11, characterized in that the dispersion has a minimum film forming temperature of 0 °C, measured according to DIN ISO 2115.
13. The method according to any of the claims 7 to 12, characterized in that the dispersion is mostly free of plasticizers and/ or non-ionic detergents, in particular mostly free of alkylphenolethoxylate.
14. The method according to any of the preceding claims, characterized in that the agrochemical is
25 selected from the group comprising insecticides, fungicides, bactericides, virucides, miticides, molluscicides, nematocides, ovicides, repellents, rodenticides, herbicides, safeners, fertilizers, biologicals, or mixtures thereof.
15. The method according to any of the preceding claims, characterized in that at least one agrochemical is selected from isotianil, sedaxane, penflufen, azole fungicides, in particular tebuconazole,
30 ipconazole, propiconazole or difenconazole, strobilurins, in particular trifloxystrobin, azoxystrobin or picoxystrobin, penthiopyrad, metalaxyl, fludioxonil, tiadinil, fipronil, flubendiamide,

chlorantraniliprole, cyantraniliprole, imidacloprid, thiacloprid, thiamethoxam, clothianidin, spinosad, ethiprole or mixtures thereof, preferably a combination of

a. isotianil and trifloxystrobin,

b. isotianil and penflufen,

5 c. penflufen and trifloxystrobin or,

d. isotianil and acetamiprid.

16. The method according to any of the preceding claims, characterized in that the seed coating further comprises at least one colorant, a surfactant, an organic solvent and/ or a further polymer or copolymer.

10 17. The method according to any of the preceding claims, characterized in that the copolymer and the agrochemical are mixed before being applied to the seed, whereas in particular the coated rice seed is then treated with a further agrochemical, preferably with an insecticide.

18. The method according to any of the claims 1 to 16, characterized in that the copolymer and the agrochemical are applied to the seed in sequential manner, whereas preferably the seed is coated
15 first with at least one agrochemical and then with the copolymer.

19. The method according to any of the preceding claims, characterized in that the application rate of the copolymer is 0,001 to 2,5 wt.-% in relation to the weight of the untreated seed, in particular 0,01 to 1,25 wt.-%, preferably 0,025 to 1 wt.-%.

20 20. The method according to any of the preceding claims, characterized in that the application rate of the agrochemical is 0,001 to 5 wt.-% in relation to the weight of the untreated seed, in particular 0,01 to 2,5 wt.-%, preferably 0,05 to 1 wt.-%.

21. Coated rice seed being at least partially coated with a rice seed treatment agent, characterized in the rice seed treatment agent comprises

a. an ethylene-vinylacetate copolymer and

25 b. at least one agrochemical.

22. Coated rice seed according to claim 21, characterized in that it shows an average germination rate reduction of 0 to 10 % after soaking the rice seed in water at 25°C followed by incubating the soaked rice seed at 7°C and 55 % rel. humidity for 144 hours compared to untreated rice seed of the same variety and age.

23. Coated rice seed according to claim 21 or 22, characterized in that the release rate of the agrochemical during soaking the rice seed in water at 25°C for 24h without agitation is 5 wt.-% or less compared to the total weight of that agrochemical in the coating, in particular 3 wt.-% or less, wherein the agrochemical is in particular selected from fungicides.

5 24. A method for protecting emerging seedlings of rice plants against fungal diseases and/ or pests before planting, the method comprising the steps of:

a. Soaking the coated rice seed according any of the claims 21 to 23 in water, in particular for at least 12 hours, and

10 b. if desired, incubating the soaked rice seed for at least 36 hours, in particular for at least 72 hours,

wherein optionally at least one further agrochemical is applied to the rice seed during soaking and/ or incubating and wherein the further agrochemical is in particular an insecticide, preferably thiamethoxam, imidacloprid, clothianidin or mixtures thereof.

15 25. The method according to claim 24, wherein the disease and/ or pest protection is still observed at 50 or more days after transplantation of the soaked and incubated seed.

26. The method according to claim 24 or 25, wherein the disease is caused by filamentous fungi and/or microorganisms.

20 27. The method according to any of the claims 24 to 26, wherein the disease is selected from rice blast (caused by *Pyricularia oryzae*), rice brown spot or rice head blight (caused by *Cochliobolus miyabeanus*), rice sheath blight (caused by *Rhizoctonia solani*), rice bacterial leaf blight (caused by *Xanthomonas oryzae* pv. *oryzae*), rice bacterial grain rot (caused by *Burkholderia glumae*) or combinations thereof.

25 28. The method according to any of the claims 24 to 27, wherein the pest is an animal pest, which is in particular selected from *Lissorhoptrus oryzophilus*, *Oulema oryzae* Kuwayama, *Delphacidae*, *Nephotettix cincticeps*, *Hydrellia griseola* (rice leaf miner), *Parnara guttata* (rice skipper), *Naranga aenescens* Moore, *Cnaphalocrocis medinalis*, *Chilo suppressalis*, *Stenchaetothrips biformis* (rice thrips) or combinations thereof.

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2015/072981

A. CLASSIFICATION OF SUBJECT MATTER

INV. A01N25/24 A01N25/26 A01N43/80 A01N37/50 A01P3/00
A01P7/00

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)

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	DATABASE WPI Week 199701 Thomson Scientific, London, GB; AN 1997-006095 XP002747919, -& JP H08 275621 A (NISSAN CHEM IND LTD) 22 October 1996 (1996-10-22)	1,6-17, 19-24, 26-28
Y	abstract examples 1, 2, 4, 7 paragraphs [[0012]] - [[[0014]]], [[0059]] - [[0061]]	1-28
Y	US 2004/025208 A1 (HARADA NAOKI [JP] ET AL) 5 February 2004 (2004-02-05) examples 1, 2 ----- -/--	1-28



Further documents are listed in the continuation of Box C.



See patent family annex.

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"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

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"&" document member of the same patent family

Date of the actual completion of the international search

22 October 2015

Date of mailing of the international search report

03/11/2015

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INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2015/072981

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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