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(54) Title: DUST-FREE GRANULES AND METHOD FOR PRODUCING SAME

(57) Abstract: The present invention discloses a dust-free granular composition. The present invention also discloses a granular composition comprising a) at least one active ingredient (A); b) a granular nucleus; c) a first coating layer of a water soluble polymer comprises said active ingredient (A) which applied on the granular nucleus; and d) at least one second coating layer of a polymeric composition applied on the first polymer coating layer. Further, the present invention relates to a process for the preparation of dust-free granular composition.



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DUST-FREE GRANULES AND METHOD FOR PRODUCING SAME**FIELD OF THE INVENTION:**

The present invention relates to a dust-free granular composition. More particularly, the present invention relates to a dust-free granular composition comprising a) at least one active ingredient (A); b) a granular nucleus; c) a first coating layer of a water soluble polymer that comprises said active ingredient (A) which applied on the granular nucleus; and d) at least one second coating layer of polymeric composition applied on the first coating layer. Further, the present invention also relates to a process for the preparation of the dust-free granular composition.

BACKGROUND OF THE INVENTION:

A large number of biologically active substances have been extensively used in various formulations for agricultural purposes for the control of weeds, insects, fungi and other pests and are usually referred to as agrochemicals/pesticides. These active substances can be solids, liquids or low melting solids. In recent years, the pesticides have been most preferably formulated in the form of dusts, wettable powders, soluble powders, granules, water dispersible granules, coated granules, emulsifiable concentrates, soluble liquid, soluble concentrates, suspension concentrates, and solutions.

Solid formulations, which are commercially available, can have various disadvantages; the dusts, granules, wettable powders and soluble powders in particular can be difficult to measure, drift problems, the dust particles tend to stick to sides of the containers, and while transferring the measured amount from the package to equipment in which the material is contacted with air can generate air-borne dust with which the user may undesirably come in contact. The left over pesticides within the containers pose great problems to the environment, operators and users. The pesticide dust may be irritating to the skin, eyes or mucous membranes of the nose or throat of the user during application.

To overcome the airborne contamination and handling difficulties, liquid spray formulations have not provided an acceptable alternative, because they involve solvents and packaging expenses, and container disposal requirements that detract from their commercial desirability. These problems impose a significant barrier in widening the market acceptance of suitable pesticides. The problems posed by dusts, wettable powders and liquid spray formulations can be overcome by coated granules as the preferred formulation.

There are various known technologies in the prior art disclosing the film/coating granular formulation, for instance:

JPS5399327 discloses a formulation in which agrochemically active ingredients are impregnated into a foamed plastic material having particle sizes of 0.1 mm to 10 mm and packed with a water soluble film.

JP06336403 discloses an agricultural formulation for application in a paddy field in which water-floatable solid agricultural chemicals containing an agrochemically active ingredient, a water-floatable

granular nucleus chosen from calcined vermiculite, foamed pearlite, foamed shirasu, and cork, a specific surfactant (acetylene alcohol) are packed with a water soluble film.

JPH09183701 discloses a formulation in which agrochemically active ingredients are coated on and carried by a granular nucleus such as pumice or calcined pearlite having apparent specific gravity of less than 1 and particle sizes of 0.3 mm to 1.4 mm and packed with a water soluble film.

However, there may arise a problem in spreadability of the components because a portion of the formulation settles down at the bottom of the water at the point of the treatment (application), and a disadvantage that since much quantity of the agrochemically active ingredient still remains on the granular nucleus made of a foamed plastic material, pumice, calcined pearlite, or the like after the treatment (application), the desired effect of the agricultural chemicals cannot be exhibited and, on the contrary, phytotoxicity may arise from bringing the agricultural chemicals gathered together by the wind.

Typical granule formulations comprise an active ingredient which is absorbed onto a granular carrier, typically comprised of cellulose, compressed wood, or clays which include, inter alia, attapulgite, montmorillonite, kaolin, or bentonite type clays and/or silica or a combination thereof. The carrier granule is then treated with a spray solution containing the active ingredient in order to coat the granules. This process frequently involves the use of a solvent in order to aid in dissolving solid active ingredients, which prevents crystallization of the active ingredient and aids in application and penetration of the spray solution by reducing viscosity. Such granule formulations typically contain relatively low concentrations of the active ingredient. This has the disadvantage that, as a result of the low active ingredient concentrations, a large amount of formulated material must be handled in order to achieve biological efficacy against target pests when treating large surface areas (such as those typical in farming applications). Also, in the granular composition that uses river sand gravel, the surface of the sand gravel is not smooth which coupled with the dirt on the sand surface, prevents the formation of uniform and stable films on its surface. Furthermore, gravel surface is composite and heterogeneous in nature and as adhesion between the polymer film and the substrate varies depending on the composition of the gravel, high strain lines are created along the contact boundaries causing the polymer film to break and strip off creating the active ingredients loaded dusting. Also, abrasion forces arising out of the granules rubbing against each other also contributes significantly to dusting.

Further, the disadvantage of some conventional granule pesticide formulations is that the total amount of active pesticide carried on the granule is limited by carrier, equipment metering and efficacy considerations to 5-25% loadings. These low loadings contribute to the expense of the granules. This and the added expense of separate granular application equipment are economic limitations on granule use. Caking can be a problem if the active pesticidal agent readily migrates to the surface of the granule

making it "sticky". Finally, since many granules are irregularly shaped, some dusting occurs as the granules wear against each other in the package during storage and handling.

Additionally, frequent handling of the granule formulations, including manufacturing, processing, shipping and their use, is known to degrade granules in a process commonly known as granular attrition.

5 Attrition of the granules leads to the generation of fine particles which may expose the operator to the absorbed pesticidal substances.

Thus, there remains a need for the development of new granular composition(s), which have "dust-free" properties thereby reducing operator exposure whilst maintaining or improving upon their utility in terms of biological efficacy and convenience (e.g. optimally carrying higher concentrations of the active
10 ingredient whilst retaining their favourable dust-free properties).

It has now surprisingly been found that certain novel granular compositions have favourable dust-free properties and advantageously, are capable of carrying higher concentrations of the active ingredient whilst retaining their favourable dust-free properties. Although, as indicated above, granules are generally known and have been commercially available for sometime now, the present invention affords
15 an economical means of making granules from chemicals and combinations thereof having a wide range of melting points, including low melters. The process according to this invention permits the formation of granules having a particularly advantageous structure and physical properties and formulation compatible with that process.

The present invention seeks to overcome, or at least ameliorate, one or more of the deficiencies mentioned above. Therefore, there is a need for solid granular formulation which has improved handling characteristics and enhanced biological activity over conventional forms, to satisfy both environmental concerns and provide an effective granular product with commercially acceptable levels of stability for
20 long term use.

OBJECTIVE OF THE INVENTION:

25 The main objective of the present invention is to provide a dust-free granular composition.

Another objective of the present invention is to provide a dust-free granular composition comprising a) at least one active ingredient (A); b) a granular nucleus; c) a first coating layer of a water soluble polymer that comprises said active ingredient (A) which is applied on the granular nucleus; and d) at least one second coating layer of polymeric composition applied on the first coating layer.

30 Yet another objective of the present invention is to provide a process for the preparation of the dust-free granular composition.

Still another object of the present invention is to provide a dust-free granular composition to prevent inhalation hazards or skin and/or eye irritation for the user during granules application.

SUMMARY OF THE INVENTION:

In one embodiment, the present invention provides a dust-free granular composition comprising a) at least one active ingredient (A); b) a granular nucleus; c) a first coating layer of a water soluble polymer that comprises said at least one active ingredient (A) which is applied on the granular nucleus; and d) at least one second coating layer of polymeric composition applied on the first coating layer.

In another embodiment, the active ingredient is selected from the group consisting of insecticides, acaricides, fungicides, herbicides, nematocides, molluscides, stimulants, plant growth regulators and/or repellents, fertilizers, biocides, pheromones, bactericides, and the like. Further, the active ingredient may be biologicals.

In yet another embodiment, the present invention provides a process for the preparation of the dust-free granular composition.

DETAILED DESCRIPTION OF THE INVENTION:**ABBREVIATIONS**

GR: Granule	e.g.: Example
PVA: Polyvinyl alcohol	PEG: Polyethylene glycol
CMC: Carboxymethyl cellulose	HPMC: Hydroxylpropyl methylcellulose
HPC: Hydroxypropyl cellulose	kDa: Thousand daltons

DEFINITIONS

The foregoing definitions provided herein for the terminologies used in the present disclosure are for illustrative purpose only and in no manner limit, the scope of the present invention disclosed in the present disclosure. It will be understood that the terminology used herein is for the purpose of describing embodiments only, and is not intended to be limiting.

As used in this specification, the singular forms "a", "an" and "the" include plural referents unless the context clearly dictates otherwise. Thus, for example, the reference to "a surfactant" includes one or more of such surfactants.

As used herein, the terms "comprises", "comprising", "includes", "including", or any other variation thereof, are intended to cover a non-exclusive inclusion, subject to any limitation explicitly indicated.

For example, a composition or a method that comprises a list of elements is not necessarily limited to only those elements but may include other elements not expressly listed or inherent to such composition, or method.

As used herein, the term "composition" or "formulation" can be used interchangeably, unless stated otherwise, is meant to encompass.

As used herein, the term “weight percent”, “wt-%”, “percent by weight”, “% by weight”, and variations thereof refer to the concentration of a substance as the weight of that substance divided by the total weight of the composition and multiplied by 100. It is understood that, as used here, “percent”, “%”, and the like are intended to be synonymous with “weight percent,” “wt-%” etc.

- 5 As used herein, the term “about” refers to variation in the numerical quantity that can occur, for example, through typical measuring and liquid handling procedures used for making concentrates or use solutions in the real world; through inadvertent error in these procedures; through differences in the manufacture, source, or purity of the ingredients used to make the compositions or carry out the methods; and the like. The term “about” also encompasses amounts that differ due to different
10 equilibrium conditions for a composition resulting from a particular initial mixture. Whether or not modified by the term “about”, the claims include equivalents to the quantities.

- As used herein, the term “active ingredient” or “agrochemically active substance” means agent/ substance that is selected from the group comprising of at least one of insecticide, acaricide, fungicide, herbicide, nematocide, molluscicide, stimulant, plant growth regulator and/or repellent, fertilizer, biocide,
15 pheromone, bactericide, and the like.

As used herein, the term “agrochemically acceptable salts” are typically acid addition salts of inorganic or organic acids, preferably of hydrochloric acid, hydrobromic acid, sulfuric acid, nitric acid, perchloric acid, phosphoric acid, formic acid, acetic acid, trifluoroacetic acid, oxalic acid, malonic acid, toluenesulfonic acid or benzoic acid.

- 20 As used herein, the term “polymorph” encompasses the different crystal forms of compound. When a compound recrystallizes from a solution or slurry, it may crystallize with different spatial lattice arrangements, a property referred to as “polymorphism”. Different polymorphic forms of a given substance may differ from each other with respect to one or more physical properties, such as solubility and dissociation, true density, crystal shape, compaction behavior, flow properties, and/or solid state
25 stability.

As used herein, the term “additive(s)” or “auxiliary agent(s)” or “agriculturally acceptable carrier(s)” can be used interchangeably and refers to inert substances which are commonly used as diluent, to provide stability or to increase the activity profile of the composition or formulation with or without having agrochemical activity.

- 30 As used herein, the term “surfactant(s)” means a compound that, when dissolved in a liquid, reduces the surface tension of the liquid, which reduces the interfacial tension between two liquids or which reduces surface tension between a liquid and a solid.

As used herein, the term “stabilizer(s)” refers to a substance capable of imparting resistance against physical or chemical deterioration or deformation.

As used herein, the term “defoaming agent(s)” refers to a chemical additive that reduces and hinders the formation of foam in the industrial process liquids, semi-solids, or solids. The terms defoaming agent and anti-foaming agent can be used interchangeably.

As used herein, the term “thickener(s)” refers to a polymeric material, which at a low concentration increases the viscosity of an aqueous solution and helps to stabilize the composition.

Unless otherwise specified, % refers to % weight, and % weight refers to % of the weight of the respective component with respect to the total weight of the composition.

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

Unless defined otherwise, all technical and scientific terms used herein have the same meaning as commonly understood by one ordinary skilled in the art to which the invention pertains. Although other methods and materials similar, or equivalent, to those described herein can be used in the practice of the present invention, the preferred materials and methods are described herein.

In one embodiment, the present invention provides a dust-free granular composition comprising:

- a) at least one active ingredient (A);
- b) a granular nucleus;
- c) a first coating layer of a water soluble polymer applied onto the granular nucleus; and
- d) at least one second polymeric composition coating layer applied onto the first coating layer.

In another embodiment, the present invention provides a dust-free granular compositions comprising:

- a) at least one active ingredient (A);
- b) a granular nucleus;
- c) a first coating layer of a water soluble polymer that comprises said active ingredient (A) which is applied on the granular nucleus; and
- d) at least one second coating layer of polymeric composition applied onto the first coating layer.

In one embodiment, the granular nucleus as used in the present invention is a water in-soluble material. General examples of water in-soluble materials are rock fines, includes fines of igneous, sedimentary, and/or metamorphic rocks and/or mineral fines. Specific examples of rock fines and/or mineral fines can include olivines, pyroxenes, plagioclases, amphiboles, muscovites, biotites, quartz, quartzite, potash feldspars, clastics, conglomerates, gravels, breccias, sand clastics, sandstones, calcium rocks, silica rocks

or silicon dioxide (SiO₂), siltstones, claystones, mudstones, shale, evaporites, halites, gypsums, anhydrites, calcites, argonites, dolomites, travertines, tufas, oolites, cherts, flints, jaspers, marbles, micas, chlorites, graphites, hornblendes, staurolites, pyroxenes, slates, phyllites, schists, gneisses, actinolites, tourmalines, migmatites, granites, pyrolusites, limonites, hematites, galenas, silvers, golds, mournites, coppers, chalcopyrites, chromites, magnetites, pyrites, talcs, montmorillonites, bauxites, kaolinites, bentonite, lithium magnesium sodium silicate (Laponite), montmorillonite, calcium sulfate, calcium phosphate, serpentines, sphalerites, siderites, fluorites, apatites, kyanites, orthoclase feldspars, plagioclase feldspars, garnets, micro-crystalline quartz, beryls, topazes, corundums, diamonds, clay, feldspar, calcite, illite, calcium carbonate, carbon, mica, Georgia white clay, hectorite, smectite, opal, pumice, , tobermite, slate, gypsum, vermiculite, halloysite, sepiolite, marls, diatomaceous earth, dolomite, attapulgite, montmorillonite, Monterey shale, Fuller's earth, fossilized plant materials, perlites, expanded perlites, combinations thereof, and the like. Preferably, the granular nucleus is selected from quartzite, quartz, silicon dioxide (SiO₂) or silica, micro-crystalline quartz, pyrites, talcs, montmorillonites, bauxites, kaolinites, bentonite, lithium magnesium sodium silicate (Laponite), calcium sulfate, calcium phosphate, white clay, hectorite, dolomite, attapulgite, Fuller's earth, fossilized plant materials, perlites or a combination thereof. More preferably, the granular nucleus is selected from dolomite, silicon dioxide (SiO₂) or silica, quartz and quartzite.

Dolomite, quartz, silica and quartzite have the advantages of being low in dust content, and offering a smoother surface and a glassy appearance that makes the coated granules appear bright and attractive – a clear differentiator with respect to other materials in the market that also conveys to its user an impression that this is a superior and purer product.

In one embodiment, the present invention comprises a granular nucleus (or core material) having a diameter in the range of 1 to 200 μm, preferably in the range of 1 to 100 μm and more preferably in the range of 1 to 50 μm.

In one embodiment, the first coating layer of the water soluble polymer having at least one active ingredient (A) incorporated therein is applied onto the granular nucleus. Suitable examples for the first coating layer of water soluble or water-dispersible hydrophilic polymers, including but not limited to polyvinyl alcohol (PVA), polyvinylpyrrolidone (PVP); water soluble synthetic polymers such as polyacrylamide (PAAM), polyacrylic acid (PAA), sodium polyacrylate, polymethacrylates, polyethyleneimine, polyhydroxyethylmethacrylate, hydroxypropyl cellulose (HPC), carboxymethyl starch, dialdehyde starch, alginate, polystyrene sulfonate; carboxymethylcellulose (CMC), hydroxylpropyl methylcellulose (HPMC), hydroxylpropyl cellulose (HPC), polysaccharides, copolymer of polyoxyethylene and polyoxypropylene, copolymer of maleic and acrylic acid, poly-*N*-alkyl acrylamides, hydroxyethyl cellulose, poly-*N*-isopropyl acrylamide (PNIAAm), chondroitin sulfate; copolymer of acrylamide and acrylate such as dextran sulfate, dermatan sulfate, copolymer of methyl vinyl ether and maleic anhydride, copolymer of ethylene and vinyl acetate, and copolymer of

dimethylacrylamide and glycidyl methacrylate, copolymer of acrylic and maleic acid, or a combination thereof. Further, water soluble or water-dispersible hydrophilic polymers can be in the form of soluble salts such as sodium acrylate. Preferably, the first coating layer of water soluble polymer is selected from polyvinyl alcohol, polyvinylpyrrolidone, polyacrylamide, polyacrylic acid, sodium polyacrylate, carboxymethyl starch, dialdehyde starch, alginate, polystyrene sulfonate, hydroxypropyl cellulose, methylcellulose, carboxymethylcellulose, hydroxyethyl cellulose, hydroxypropyl methylcellulose, or a combination thereof. More preferably, the first coating layer of water soluble polymer is selected from polyvinyl alcohol, carboxymethylcellulose, hydroxypropyl methylcellulose, hydroxypropyl cellulose or a combination thereof.

In an embodiment, the content of the first coating layer of the water soluble polymer is 0.01 parts by weight to 50 parts by weight for 100 parts by weight of the granular nucleus; preferably 0.05 parts by weight to 10 parts by weight for 100 parts by weight of the granular nucleus

In an embodiment, the thickness of the first coating layer of the water soluble polymer is in the range of 0.01 to 20 μm , preferably in the range of 0.1 to 10 μm , and more preferably in the range of 0.1 to 5 μm .

In an embodiment, the molecular weight of the first coating layer of the water soluble polymer is in the range of 100 to 100 kDa (or 100000 Da), preferably 100 to 5000 Da, and more preferably 100 to 1000 Da.

In one embodiment, the second coating layer of the polymeric composition on the first coating layer to control dusting due to abrasion that rips off the first coating layer containing the active ingredients preferably has a molecular weight of more than 5000 Da. Suitable examples for the second coating layer include polyethylene glycols (PEG), polysiloxanes, polyacrylates, polyoxyethylene oxides, poloxamers, polyoxyethylene stearates, poly-epsilon caprolactone, polyglycolized glycerides polyvinylpyrrolidones, copolymer of polyvinyl and polyvinylacetate (PVP-PVA), polyvinyl alcohol (PVA), polymethacrylic polymers, hydroxypropyl methylcellulose (HPMC), hydroxypropyl cellulose (HPC), methylcellulose, sodium carboxymethylcellulose, hydroxyethyl cellulose, pectins, cyclodextrins, gaiactomannans, alginates, carragenates, xanthan gums, polyacrylonitrile, acrylonitrile butadiene styrene (ABS) polymer, acrylic (PMMA), celluloid, cellulose acetate, ethylene-vinyl acetate (EVA), ethylene vinyl alcohol (EVOH), fluoropolymers (PTFE, FEP, PFA, CTFE, ECTFE, ETFE), liquid crystal polymer (LCP), polyacetal (POM or Acetal), polyacrylates (acrylic), polyacrylonitrile (PAN or acrylonitrile), polyamide (PA or Nylon), polyamide-imide (PAT), polyaryletherketone (PAEK or Ketone), polybutadiene (PBD), polybutylene (PB), polybutylene terephthalate (PBT), polycaprolactone (PCL), polychlorotrifluoroethylene (PCTFE), polyethylene terephthalate (PET), polycyclohexylene dimethylene terephthalate (PCT), polycarbonate (PC), polyhydroxyalkanoates (PHAs), polyketone (PK), polyester, polyethylene (PE), polyetheretherketone (PEEK),

polyetherketoneketone (PEKK), polyetherimide (PEI), polyethersulfone (PES), polyethylenechlorinates (PEC), polyimide (PI), polylactic acid (PLA), polymethylpentene (PMP), polyphenylene oxide (PPO), polyphenylene sulfide (PPS), polyphthalamide (PPA), polypropylene (PP), polystyrene (PS), polysulfone (PSU), polytrimethylene terephthalate (PTT), polyurethane (PU),
5 polyvinyl acetate (PVA), polyvinyl chloride (PVC), polyvinylidene chloride (PVDC), styrene-acrylonitrile (SAN), silicone polymers, or a combination thereof. Preferably, the second coating layer is selected from polyethylene glycols, polysiloxanes, polyacrylates, polymethacrylic polymers, polyacrylonitrile, acrylonitrile butadiene styrene polymer, celluloid, cellulose acetate, ethylene-vinyl acetate, ethylene vinyl alcohol, polybutylene terephthalate, polycaprolactone,
10 polychlorotrifluoroethylene, polyethylene terephthalate, polycyclohexylene dimethylene terephthalate, polycarbonate or a combination thereof. More preferably, the second coating layer is selected from polyethylene glycols, polysiloxanes, and polyacrylates or a combination thereof.

In an embodiment, the content of the second coating layer of polymer is 0.01 parts by weight to 50 parts by weight for 100 parts by weight of the granular nucleus; preferably 0.05 parts by weight to 10 parts
15 by weight for 100 parts by weight of the granular nucleus.

In an embodiment, the thickness of the second coating layer of the polymer composition is in the range of 0.01 to 20 μm , preferably in the range of 0.1 to 10 μm , and more preferably in the range of 0.1 to 5 μm .

In an embodiment, the molecular weight of the second coating layer of the polymeric composition
20 polymer is in the range of 10 kDa to 100 kDa, preferably 10 kDa to 50 kDa, and more preferably 10 kDa to 30 kDa (or in the range of 10000 Da to 100000 Da, preferably 10000 Da to 50000 Da, and more preferably 10000 Da to 30000 Da).

The second coating layer of the polymeric composition is selected such that it controls the dusting due to abrasion that rips off the first water soluble polymer coating layer containing the active ingredient(s).
25 The second coating outer layer also improves the grease compatibility of the first coating layer of water soluble polymer and can further provide cleaning benefits. The coating layer provides higher adhesiveness, lubrication and pinhole free surface. The second coating layer material has a high melting point, and has low solubility in water.

In one embodiment, the dust-free granular composition comprises an active ingredient that is water
30 soluble or water in-soluble. In another embodiment, the active ingredient is selected from insecticides, fungicides, herbicides, acaricides, nematocides, molluscides, stimulants, plant growth regulators and/or repellents, fertilizers, biocides, pheromones, bactericides or a combination thereof. Preferred pesticides are fungicides, insecticides, stimulants, and herbicides. Mixtures of pesticides of two or more of the abovementioned classes may also be used. The skilled worker is familiar with such pesticides, which

can be found, for example, in the The Pesticide Manual, 19th Edition (2021), The British Crop Protection Council, London.

In an embodiment, the examples of insecticides may be selected from the following groups:

(A) Acetylcholinesterase (AChE) inhibitors, selected from the class of

- 5 (A1) Carbamates, for example, (A1001) alanycarb, (A1002) aldicarb, (A1003) bendiocarb, (A1004) benfuracarb, (A1005) butocarboxim, (A1006) butoxycarboxim, (A1007) carbaryl, (A1008) carbofuran, (A1009) carbosulfan, (A1010) ethiofencarb, (A1011) fenobucarb, (A1012) formetanate, (A1013) furathiocarb, (A1014) isoprocarb, (A1015) methiocarb, (A1016) methomyl, (A1017) metolcarb, (A1018) oxamyl, (A1019) pirimicarb, (A1020) propoxur, (A1021) thiodicarb, (A1022) thiofanox,
10 (A1023) triazamate, (A1024) trimethacarb, (A1025) XMC, (A1026) xylylcarb;

- (A2) Organophosphates, for example, (A2001) acephate, (A2002) azamethiphos, (A2003) azinphos-ethyl, (A2004) azinphosmethyl, (A2005) cadusafos, (A2006) chlorethoxyfos, (A2007) chlorfenvinphos, (A2008) chlormephos, (A2009) chlorpyrifos, (A2010) chlorpyrifos-methyl, (A2011) coumaphos, (A2012) cyanophos, (A2013) demeton-s-methyl, (A2014) diazinon, (A2015)
15 dichlorvos/ddvp, (A2016) dicrotophos, (A2017) dimethoate, (A2018) dimethylvinphos, (A2019) disulfoton, (A2020) EPN, (A2021) ethion, (A2022) ethoprophos, (A2023) famphur, (A2024) fenamiphos, (A2025) fenitrothion, (A2026) fenthion, (A2027) fosthiazate, (A2028) heptenophos, (A2029) imicyafos, (A2030) isofenphos, (A2031) isopropyl o-(methoxyaminothio-phosphoryl) salicylate, (A2032) isoxathion, (A2033) malathion, (A2034) mecarbam, (A2035) methamidophos,
20 (A2036) methidathion, (A2037) mevinphos, (A2038) monocrotophos, (A2039) naled, (A2040) omethoate, (A2041) oxydemeton-methyl, (A2042) parathion, (A2043) parathion-methyl, (A2044) phenthoate, (A2045) phorate, (A2046) phosalone, (A2047) phosmet, (A2048) phosphamidon, (A2049) phoxim, (A2050) pirimiphos-methyl, (A2051) profenofos, (A2052) propetamphos, (A2053) prothiofos, (A2054) pyraclofos, (A2055) pyridaphenthion, (A2056) quinalphos, (A2057) sulfotep, (A2058)
25 tebupirimfos, (A2059) temephos, (A2060) terbufos, (A2061) tetrachlorvinphos, (A2062) thiometon, (A2063) triazophos, (A2064) trichlorfon, (A2065) vamidothion;

(B) GABA-gated chloride channel blockers, selected from the class of

- (B1) Cyclodiene organochlorines, for example, (B1001) chlordane, (B1002) endosulfan;
(B2) Phenylpyrazoles (fiproles), for example, (B2001) ethiprole, (B2002) fipronil, (B2003) flufiprole,
30 (B2004) pyrafluprole, (B2005) pyriprole;

(C) Sodium channel modulators, selected from the class of

(C1) Pyrethroids/Pyrethrins, for example, (C1001) acrinathrin, (C1002) allethrin, (C1003) d-cis-trans allethrin, (C1004) d-trans-allethrin, (C1005) bifenthrin, (C1006) bioallethrin, (C1007) bioallethrin s-cyclopentenyl isomer, (C1008) bioresmethrin, (C1009) cycloprothrin, (C1010) cyfluthrin, (C1011)

- beta-cyfluthrin, (C1012) cyhalothrin, (C1013) lambda-cyhalothrin, (C1014) gamma-cyhalothrin, (C1015) cypermethrin, (C1016) alpha-cypermethrin, (C1017) beta-cypermethrin, (C1018) theta-cypermethrin, (C1019) zeta-cypermethrin, (C1020) cyphenothrin, (C1021) (1R)-trans- isomers], (C1022) deltamethrin, (C1023) empenethrin (EZ)-(1R)-isomers], (C1024) esfenvalerate, (C1025) etofenprox, (C1026) fenpropathrin, (C1027) fenvalerate, (C1028) flucythrinate, (C1029) flumethrin, (C1030) tau-fluvalinate, (C1031) halfenprox, (C1032) imiprothrin, (C1033) meperfluthrin, (C1034) metofluthrin, (C1035) momfluorothrin, (C1036) kadethrin, (C1037) permethrin, (C1038) phenothrin [(1R)-trans-isomer], (C1039) prallethrin, (C1040) profluthrin, (C1041) pyrethrins (pyrethrum), (C1042) resmethrin, (C1043) silafluofen, (C1044) tefluthrin, (C1045) tetramethylfluthrin, (C1046) tetramethrin, (C1047) tetramethrin [(1R)-isomers], (C1048) tralomethrin, (C1049) transfluthrin;
- (C2) Organochlorine, for example, (C2001) DDT, (C2002) methoxychlor;
- (D) Nicotinic acetylcholine receptor (nAChR) competitive modulators, selected from the class of
- (D1) Neonicotinoids, for example, (D1001) acetamiprid, (D1002) clothianidin, (D1003) dinotefuran, (D1004) imidacloprid, (D1005) nitenpyram, (D1006) thiacloprid, (D1007) thiamethoxam, (D1008) 1-[(6-chloro-3-pyridinyl)methyl]-2,3,5,6,7,8-hexahydro-9-nitro-(5S,8R)-5,8-epoxy-H-imidazo[1,2-a]azepine, (D1009) 1-[(6-chloro-3-pyridyl)methyl]-2-nitro-1-[(E)-pentylideneamino]guanidine, (D1010) 1-[(6-chloro-3-pyridyl)methyl]-7-methyl-8-nitro-5-propoxy-3,5,6,7-tetrahydro-2H-imidazo[1,2-a]pyridine;
- (D2001) nicotine;
- (D3) Sulfoximines, for example, (D3001) sulfoxaflor;
- (D4) Butenolides, for example, (D4001) flupyradifurone;
- (D5) Mesoionics, for example, (D5001) triflumezopyrim, (D5002) dichloromezotiazze;
- (D6) Pyridylidenes, for example, (D6001) flupyrimin;
- (E) Nicotinic acetylcholine receptor (nAChR) allosteric modulators – Site I, selected from the class of
- (E1) Spinosyns, for example, (E1001) spinetoram, (E1002) spinosad;
- (F) Glutamate-gated chloride channel (GluCl) allosteric modulators, selected from the class of
- (F1) Avermectins/Milbemycins, for example, (F1001) abamectin, (F1002) emamectin benzoate, (F1003) lepipmectin, (F1004) milbemectin;
- (G) Juvenile hormone mimics, selected from the class of
- (G1) Juvenile hormone analogues, for example, (G1001) hydroprene, (G1002) kinoprene, (G1003) methoprene;
- (G2001) fenoxycarb;

- (G3001) pyriproxyfen;
- (H) Miscellaneous non-specific (multi-site) inhibitors, selected from the class of
- (H1) Alkyl halides, for example, (H1001) methyl bromide, (H1002) other alkyl halides;
- (H2001) chloropicrin;
- 5 (H3) Fluorides, for example, (H3001) cryolite (sodium aluminium fluoride), (H3002) sulfuric fluoride;
- (H4) Borates, for example, (H4001) borax, (H4002) boric acid, (H4003) disodium octaborate, (H4004) sodium borate, (H4005) sodium metaborate;
- (H5001) tartar emetic;
- (H6) Methyl isothiocyanate generators, for example, (H6001) dazomet, (H6002) metam;
- 10 (I) Chordotonal organ TRPV channel modulators, selected from the class of
- (I1) Pyridine azomethine derivatives, for example, (I1001) pymetrozine, (I1002) pyrifluquinazon;
- (I2001) afidopyropen;
- (J) Mite growth inhibitors affecting CHS1, selected from the class of
- (J1) Clofentezine, Diflovidazin, Hexythiazox, for example, (J1001) clofentezine, (J1002) hexythiazox,
- 15 (J1003) diflovidazin;
- (J2003) etoxazole;
- (K) Microbial disruptors of insect midgut membranes, selected from the class of
- (K1) *Bacillus thuringiensis* and the Insecticidal Proteins they produce, for example, (K1001) *Bacillus thuringiensis*, (K1002) *Bacillus thuringiensis* var. *israelensis*, (K1003) *Bacillus thuringiensis* var. *aizawai*, (K1004) *Bacillus thuringiensis* var. *kurstaki*, (K1005) *Bacillus thuringiensis* var. *tenebrionis*,
- 20 (K1006) Cry1Ab, (K1007) Cry1Ac, (K1008) Cry1Fa, (K1009) Cry1A.105, (K1010) Cry2Ab, (K1011) Vip3A, (K1012) mCry3A, (K1013) Cry3Ab, (K1014) Cry3Bb, (K1015) Cry34/35Ab1;
- (K2001) *Bacillus sphaericus*;
- (L) Inhibitors of mitochondrial ATP synthase, selected from the class of
- 25 (L1001) diafenthiuron;
- (L2) Organotin miticides, for example, (L2001) azocyclotin, (L2002) cyhexatin, (L2003) fenbutatin oxide;
- (L3001) propargite;
- (L4001) tetradifon;

- (M) Uncouplers of oxidative phosphorylation via disruption of the proton gradient, selected from the class of
- (M1) Pyrroles, for example, (M1001) chlorfenapyr;
- (M2) Dinitrophenols, for example, (M2001) DNOC;
- 5 (M3001) sulfluramid;
- (N) Nicotinic acetylcholine receptor (nAChR) channel blockers, selected from the class of
- (N1) Nereistoxin analogues, for example, (N1001) bensultap, (N1002) cartap hydrochloride, (N1003) thiocyclam, (N1004) thiocyclam hydrogen oxalate, (N1005) thiosultap-sodium;
- (O) Inhibitors of the chitin biosynthesis affecting CHS1, selected from the class of
- 10 (O1) Benzoylureas, for example, (O1001) bistrifluron, (O1002) chlorfluazuron, (O1003) diflubenzuron, (O1004) flucycloxuron, (O1005) flufenoxuron, (O1006) hexaflumuron, (O1007) lufenuron, (O1008) novaluron, (O1009) noviflumuron, (O1010) teflubenzuron, (O1011) triflumuron;
- (P) Inhibitors of the chitin biosynthesis type 1, for example, (P1001) buprofezin;
- (Q) Moulting disruptors, selected from the class of
- 15 (Q1) Dipteran, for example, (Q1001) cyromazine;
- (R) Ecdysone receptor agonists, selected from the class of
- (R1) Diacylhydrazines, for example, (R1001) methoxyfenozide, (R1002) tebufenozide, (R1003) halofenozide, (R1004) fufenozide, (R1005) chromafenozide;
- (S) Octopamin receptor agonists, for example, (S1001) amitraz;
- 20 (T) Mitochondrial complex III electron transport inhibitors, for example, (T1001) hydramethylnon; (T2001) acequinocyl; (T3001) fluacrypyrim; (T4001) bifenazate;
- (U) Mitochondrial complex I electron transport inhibitors, selected from the class of
- (U1) METI acaricides and insecticides, for example, (U1001) fenazaquin, (U1002) fenpyroximate, (U1003) pyrimidifen, (U1004) pyridaben, (U1005) tebufenpyrad, (U1006) tolfenpyrad;
- 25 (U2001) rotenone;
- (V) Voltage-dependent sodium channel blockers, selected from the class of
- (V1) Oxadiazines, for example, (V1001) indoxacarb;
- (V2) Semicarbazones, for example, (V2001) metaflumizone;
- (V3001) 1-[(E)-[2-(4-cyanophenyl)-1-[3-(trifluoromethyl)phenyl]ethylidene]amino]-3-[4-(difluoromethoxy)phenyl]urea;
- 30

(V4001) 2-[3-(ethanesulfonyl)pyridin-2-yl]-5-[trifluoro(methanesulfonyl)]-1,3-benzoxazole (oxazosulfonyl);

(W) Inhibitors of the acetyl CoA carboxylase, selected from the class of

(W1) Tetronic and Tetramic acid derivatives, for example, (W1001) spirodiclofen, (W1002) spiromesifen, (W1003) spiropidion, (W1004) spirotetramat;

(X) Mitochondrial complex IV electron transport inhibitors, selected from the class of

(X1) Phosphides, for example, (X1001) aluminium phosphide, (X1002) calcium phosphide, (X1003) phosphine, (X1004) zinc phosphide;

(X2) Cyanides, for example, (X2001) calcium cyanide, (X2002) potassium cyanide, (X2003) sodium cyanide;

(Y) Mitochondrial complex II electron transport inhibitors, selected from the class of

(Y1) Beta-ketonitrile derivatives, for example, (Y1001) cyenopyrafen, (Y1002) cyflumetofen;

(Y2) Caboxanilides, for example, (Y2001) pyflubumide;

(Z) Ryanodine receptor-modulators, selected from the class of

(Z1) Diamides, for example, (Z1001) flubendiamide, (Z1002) chlorantraniliprole (Rynaxypyr®), (Z1003) cyantraniliprole (Cyazypyr®), (Z1004) cyclaniliprole, (Z1005) tetraniliprole, (Z1006) tetra-chlorantraniliprole, (Z1007) (R)-3-Chlor-N1-{2-methyl-4-[1,2,2,2-tetrafluor-1-(trifluormethyl)ethyl]phenyl}-N2-(1-methyl-2-methylsulfonyl)ethylphthalamid, (Z1008) (S)-3-Chlor-N1-{2-methyl-4-[1,2,2,2-tetrafluor-1-(trifluormethyl)ethyl]phenyl}-N2-(1-methyl-2-

methylsulfonyl)ethylphthalamid, (Z1009) methyl-2-[3,5-dibromo-2-([3-bromo-1-(3-chlorpyridin-2-yl)-1H-pyrazol-5-yl]carbonyl)amino]benzoyl-1,2-dimethylhydrazinecarboxylate, (Z1010) N-[2-(5-amino-1,3,4-thiadiazol-2-yl)-4-chloro-6-methyl-phenyl]-5-bromo-2-(3-chloro-2-pyridyl)pyrazole-3-carboxamide, (Z1011) 5-chloro-2-(3-chloro-2-pyridyl)-N-[2,4-dichloro-6-[(1-cyano-1-methyl-ethyl)carbamoyl]phenyl]pyrazole-3-carboxamide, (Z1012) 5-bromo-N-[2,4-dichloro-6-(methylcarbamoyl)phenyl]-2-(3,5-dichloro-2-pyridyl)pyrazole-3-carboxamide, (Z1013) N-[2-(tert-butylcarbamoyl)-4-chloro-6-methyl-phenyl]-2-(3-chloro-2-pyridyl)-5-(fluoromethoxy)pyrazole-3-carboxamide, (Z1014) N2-(1-cyano-1-methyl-ethyl)-N1-(2,4-dimethylphenyl)-3-iodo-phthalamide; and 3-chloro-N2-(1-cyano-1-methyl-ethyl)-N1-(2,4-dimethylphenyl)phthalamide;

(AA) Chordotonal organ Modulators – undefined target site, for example, (AA1001) flonicamid;

(BB) GABA-gated chloride channel allosteric modulators, selected from the class of

(BB1) Meta-diamides, for example, (BB1001) broflanilide;

(BB2) Isoxazolines, for example, (BB2001) fluxametamide, (BB2002) isocycloseram;

(CC) Baculoviruses, selected from the class of

(CC1) Granuloviruses (GVs), for example, (CC1001) *Cydia pomonella* GV, (CC1002) *Thaumatotibia leucotreta* GV;

(CC2) Nucleopolyhedroviruses (NPVs), for example, (CC2001) *Anticarsia gemmatilis* MNPV, (CC2002) *Helicoverpa armigera* NPV;

(DD) Nicotinic Acetylcholine Receptor (nAChR) Allosteric Modulators - Site II, for example, (DD1001) GS omega/kappa HXTX-Hv1a peptide;

(EE) Insecticidal active compounds of unknown or uncertain mode of action, for example, (EE1001) afidopyropen, (EE1002) azadirachtin, (EE1003) amidoflumet, (EE1004) benzoximate, (EE1005)

benzpyrimoxan, (EE1006) bifenthrin, (EE1007) bromopropylate, (EE1008) chinomethionat, (EE1009) cryolite, (EE1010) dicofol, (EE1011) flufenimer, (EE1012) flometoquin, (EE1013) fluhexafon, (EE1014) fluensulfone, (EE1015) flupyradifurone, (EE1016) lime sulphur, (EE1017) mancozeb, (EE1018) piperonyl butoxide, (EE1019) pyridalyl, (EE1020) pyrifluquinazon, (EE1021) sulfoxaflo, (EE1022) sulphur, (EE1023) 4-[5-(3,5-Dichloro-phenyl)-5-trifluoromethyl-4,5-dihydro-isoxazol-3-yl]-

2-methyl-N-[(2,2,2-trifluoro-ethylcarbamoyl)-methyl]-benzamide, (EE1024) cyclopropaneacetic acid, (EE1025) 1,1'-[(3S,4R,4aR,6S,6aS,12R,12aS,12bS)-4-[(2-cyclopropylacetyl)oxy]methyl]-1,3,4,4a,5,6,6a,12,12a,12b-decahydro-12-hydroxy-4,6a,12b-trimethyl-11-oxo-9-(3-pyridinyl)-

2H,11H-naphtho[2,1-b]pyrano[3,4-e]pyran-3,6-diyl]ester, (EE1026) 11-(4-chloro-2,6-dimethylphenyl)-12-hydroxy-1,4-dioxo-9-azadispiro[4.2.4.2]-tetradec-11-en-10-one, (EE1027) 4,3-

(4'-fluoro-2,4-dimethylbiphenyl-3-yl)-4-hydroxy-8-oxa-1-azaspiro[4.5]dec-3-en-2-one, (EE1028) 1-[2-fluoro-4-methyl-5-[(2,2,2-trifluoroethyl)sulfinyl]phenyl]-3-(trifluoromethyl)-1H-1,2,4-triazole-5-

amine, (EE1029) actives on basis of bacillus firmus (Votivo, II-1582), (EE1030) (E/Z)-N-[1-[(6-chloro-3-pyridyl)methyl]-2-pyridylidene]-2,2,2-trifluoro-acetamide, (EE1031) (E/Z)-N-[1-[(6-chloro-5-fluoro-3-pyridyl)methyl]-2-pyridylidene]-2,2,2-trifluoro-acetamide, (EE1032) (E/Z)-2,2,2-

trifluoro-N-[1-[(6-fluoro-3-pyridyl)methyl]-2-pyridylidene]acetamide, (EE1033) (E/Z)-N-[1-[(6-bromo-3-pyridyl)methyl]-2-pyridylidene]-2,2,2-trifluoro-acetamide, (EE1034) (E/Z)-N-[1-[(6-chloro-3-pyridyl)ethyl]-2-pyridylidene]-2,2,2-trifluoro-acetamide, (EE1035) (E/Z)-N-[1-[(6-chloro-3-pyridyl)methyl]-2-pyridylidene]-2,2-difluoro-acetamide, (EE1036) (E/Z)-2-chloro-N-[1-[(6-chloro-3-pyridyl)methyl]-2-pyridylidene]-2,2-difluoro-acetamide, (EE1037) (E/Z)-N-[1-[(2-

chloropyrimidin-5-yl)methyl]-2-pyridylidene]-2,2,2-trifluoro-acetamide, (EE1038) (E/Z)-N-[1-[(6-chloro-3-pyridyl)methyl]-2-pyridylidene]-2,2,3,3,3-pentafluoro-propanamide), (EE1039)

triflumezopyrim, (EE1040) 4-[5-[3-chloro-5-(trifluoromethyl)phenyl]-5-(trifluoromethyl)-4H-isoxazol-3-yl]-N-[2-oxo-2-(2,2,2-trifluoroethylamino)ethyl]naphthalene-1-carboxamide, (EE1041) 3-

[3-chloro-5-(trifluoromethyl)phenyl]-4-oxo-1-(pyrimidin-5-ylmethyl)pyrido[1,2-a]pyrimidin-1-ium-2-

olate, (EE1042) 8-chloro-N-[2-chloro-5-methoxyphenyl)sulfonyl]-6-trifluoromethyl-imidazo[1,2-

olate, (EE1042) 8-chloro-N-[2-chloro-5-methoxyphenyl)sulfonyl]-6-trifluoromethyl-imidazo[1,2-

a]pyridine-2-carboxamide, (EE1043) 4-[5-(3,5-dichlorophenyl)-5-(trifluoromethyl)-4H-isoxazol-3-yl]-2-methyl-N-(1-oxothietan-3-yl)benzamide, (EE1044) 5-[3-[2,6-dichloro-4-(3,3-dichloroallyloxy)phenoxy]propoxy]-1H-pyrazole, (EE1045) dimpropyridaz, (EE1046) tyclopyrazoflor, (EE1047) nicofluprole, (EE1048) acynonapyr;

5 (FF) Biopesticides, selected from the class of

(FF1) Microbial pesticides, for example, (FF1001) *Bacillus firmus*, (FF1002) *Bacillus thuringiensis* subsp. *galleriae*, (FF1003) *Bacillus thuringiensis* subsp. *kurstaki*, (FF1004) *Beauveria bassiana*, (FF1005) *Burkholderia* sp., (FF1006) *Chromobacterium subtsugae*, (FF1007) *Chromobacterium subtsugae* sp. nov., (FF1008) *Isaria fumosorosea*, (FF1009) *Lecanicillium longisporum*, (FF1010) *Lecanicillium muscarium* (formerly *Verticillium lecanii*), (FF1011) *Metarhizium anisopliae*, (FF1012) *Metarhizium anisopliae* var. *acridum*, (FF1013) *Paecilomyces fumosoroseus* Apopka strain 97, (FF1014) *Purpureocillium lilacinus*, (FF1015) *Paenibacillus popilliae*, (FF1016) *Pasteuria* spp., (FF1017) *Pasteuria nishizawae*, (FF1018) *Pasteuria reneformis*, (FF1019) *Pasteuria usagae*, (FF1020) *Pseudomonas fluorescens*, (FF1021) *Steinernema feltiae*, (FF1022) *Streptomces galbus*, (FF1023)

15 *Wolbachia pipientis* (Zap); and

(GG) Biochemical pesticides with insecticidal, acaricidal, molluscidal, pheromone and/or nematicidal activity, for example, (GG1001) L-carvone, (GG1002) citral, (GG1003) (E,Z)-7,9-dodecadien-1-yl acetate, (GG1004) ethyl formate, (GG1005) (E,Z)-2,4-ethyl decadienoate (pear ester), (GG1006) (Z,Z,E)-7,11,13-hexadecatrienal, (GG1007) heptyl butyrate, (GG1008) isopropyl myristate, (GG1009) lavanulyl senecioate, (GG1010) 2-methyl 1-butanol, (GG1011) methyl eugenol, (GG1012) methyl jasmonate, (GG1013) (E,Z)-2,13-octadecadien-1-ol, (GG1014) (E,Z)-2,13-octadecadien-1-ol acetate, (GG1015) (E,Z)-3,13-octadecadien-1-ol, (GG1016) R-1-octen-3-ol, (GG1017) pentatermanone, (GG1018) potassium silicate, (GG1019) sorbitol actanoate, (GG1020) (E,Z,Z)-3,8,11-tetradecatrienyl acetate, (GG1021) (Z,E)-9,12-tetradecadien-1-yl acetate, (GG1022) Z-7-tetradecen-2-one, Z-9-tetradecen-1-yl acetate, (GG1023) Z-11-tetradecenal, (GG1024) Z-11-tetradecen-1-ol, (GG1025) *Acacia negra* extract, (GG1026) extract of grapefruit seeds and pulp, (GG1027) extract of *Chenopodium ambrosioidae*, (GG1028) fatty acid monoester with glycerol or propanediol, (GG1029) catnip oil, (GG1030) neem oil, (GG1031) quillay extract, (GG1032) tagetes oil.

In a preferred embodiment, the novel granular agrochemical composition according to the invention comprises at least one insecticidally or nematicidally active compound (III) as a component (2) selected from the following groups:

(B) GABA-gated chloride channel blockers, selected from the class of

(B1) Cyclodiene organochlorines, for example, (B1001) chlordane, (B1002) endosulfan;

(B2) Phenylpyrazoles (fiproles), for example, (B2001) ethiprole, (B2002) fipronil, (B2003) flufiprole, (B2004) pyrafluprole, (B2005) pyriprole;

(C) Sodium channel modulators, selected from the class of

(C1) Pyrethroids/Pyrethrins, for example, (C1001) acrinathrin, (C1002) allethrin, (C1003) d-cis-trans allethrin, (C1004) d-trans-allethrin, (C1005) bifenthrin, (C1006) bioallethrin, (C1007) bioallethrin s-
 5 cyclopentenyl isomer, (C1008) bioresmethrin, (C1009) cycloprothrin, (C1010) cyfluthrin, (C1011) beta-cyfluthrin, (C1012) cyhalothrin, (C1013) lambda-cyhalothrin, (C1014) gamma-cyhalothrin, (C1015) cypermethrin, (C1016) alpha-cypermethrin, (C1017) beta-cypermethrin, (C1018) theta-cypermethrin, (C1019) zeta-cypermethrin, (C1020) cyphenothrin, (C1021) (1R)-trans- isomers],
 10 (C1022) deltamethrin, (C1023) empenethrin (EZ)-(1R)-isomers], (C1024) esfenvalerate, (C1025) etofenprox, (C1026) fenpropathrin, (C1027) fenvalerate, (C1028) flucythrinate, (C1029) flumethrin, (C1030) tau-fluvalinate, (C1031) halfenprox, (C1032) imiprothrin, (C1033) meperfluthrin, (C1034) metofluthrin, (C1035) momfluorothrin, (C1036) kadethrin, (C1037) permethrin, (C1038) phenothrin [(1R)-trans-isomer], (C1039) prallethrin, (C1040) profluthrin, (C1041) pyrethrins (pyrethrum),
 15 (C1042) resmethrin, (C1043) silafluofen, (C1044) tefluthrin, (C1045) tetramethylfluthrin, (C1046) tetramethrin, (C1047) tetramethrin [(1R)-isomers], (C1048) tralomethrin, (C1049) transfluthrin;

(C2) Organochlorine, for example, (C2001) DDT, (C2002) methoxychlor;

(D) Nicotinic acetylcholine receptor (nAChR) competitive modulators, selected from the class of

(D1) Neonicotinoids, for example, (D1001) acetamiprid, (D1002) clothianidin, (D1003) dinotefuran,
 20 (D1004) imidacloprid, (D1005) nitenpyram, (D1006) thiacloprid, (D1007) thiamethoxam, (D1008) 1-[(6-chloro-3-pyridinyl)methyl]-2,3,5,6,7,8-hexahydro-9-nitro-(5S,8R)-5,8-epoxy-H-imidazo[1,2-a]azepine, (D1009) 1-[(6-chloro-3-pyridyl)methyl]-2-nitro-1-[(E)-pentylideneamino]guanidine, (D1010) 1-[(6-chloro-3-pyridyl)methyl]-7-methyl-8-nitro-5-propoxy-3,5,6,7-tetrahydro-2H-imidazo[1,2-a]pyridine;

25 (D2001) nicotine;

(D3) Sulfoximines, for example, (D3001) sulfoxaflor;

(D4) Butenolides, for example, (D4001) flupyradifurone;

(D5) Mesoionics, for example, (D5001) triflumezopyrim, (D5002) dichloromezotiaze;

(D6) Pyridylidenes, for example, (D6001) flupyrimin;

30 (E) Nicotinic acetylcholine receptor (nAChR) allosteric modulators – Site I, selected from the class of

(E1) Spinosyns, for example, (E1001) spinetoram, (E1002) spinosad;

(F) Glutamate-gated chloride channel (GluCl) allosteric modulators, selected from the class of

- (F1) Avermectins/Milbemycins, for example, (F1001) abamectin, (F1002) emamectin benzoate, (F1003) lepipsectin, (F1004) milbemectin;
- (G) Juvenile hormone mimics, selected from the class of
- (G1) Juvenile hormone analogues, for example, (G1001) hydroprene, (G1002) kinoprene, (G1003) methoprene;
- (G2001) fenoxycarb;
- (G3001) pyriproxyfen;
- (I) Chordotonal organ TRPV channel modulators, selected from the class of
- (I1) Pyridine azomethine derivatives, for example, (I1001) pymetrozine, (I1002) pyrifluquinazon;
- (I2001) afidopyropen;
- (K) Microbial disruptors of insect midgut membranes, selected from the class of
- (K1) *Bacillus thuringiensis* and the Insecticidal Proteins they produce, for example, (K1001) *Bacillus thuringiensis*, (K1002) *Bacillus thuringiensis* var. *israelensis*, (K1003) *Bacillus thuringiensis* var. *aizawai*, (K1004) *Bacillus thuringiensis* var. *kurstaki*, (K1005) *Bacillus thuringiensis* var. *tenebrionis*, (K1006) Cry1Ab, (K1007) Cry1Ac, (K1008) Cry1Fa, (K1009) Cry1A.105, (K1010) Cry2Ab, (K1011) Vip3A, (K1012) mCry3A, (K1013) Cry3Ab, (K1014) Cry3Bb, (K1015) Cry34/35Ab1;
- (K2001) *Bacillus sphaericus*;
- (M) Uncouplers of oxidative phosphorylation via disruption of the proton gradient, selected from the class of
- (M1) Pyrroles, for example, (M1001) chlorfenapyr;
- (M2) Dinitrophenols, for example, (M2001) DNOC;
- (M3001) sulfluramid;
- (V) Voltage-dependent sodium channel blockers, selected from the class of
- (V1) Oxadiazines, for example, (V1001) indoxacarb;
- (V2) Semicarbazones, for example, (V2001) metaflumizone;
- (V3001) 1-[(E)-[2-(4-cyanophenyl)-1-[3-(trifluoromethyl)phenyl]ethylidene]amino]-3-[4-(difluoromethoxy)phenyl]urea;
- (V4001) 2-[3-(ethanesulfonyl)pyridin-2-yl]-5-[trifluoro(methanesulfonyl)]-1,3-benzoxazole (oxazosulfonyl);
- (Z) Ryanodine receptor-modulators, selected from the class of

- (Z1) Diamides, for example, (Z1001) flubendiamide, (Z1002) chlorantraniliprole (Rynaxypyr®), (Z1003) cyantraniliprole (Cyazypyr®), (Z1004) cyclaniliprole, (Z1005) tetraniliprole, (Z1006) tetra-chlorantraniliprole, (Z1007) (R)-3-Chlor-N1-{2-methyl-4-[1,2,2,2-tetrafluor-1-(trifluoromethyl)ethyl]phenyl}-N2-(1-methyl-2-methylsulfonyl)phthalamid, (Z1008) (S)-3-Chlor-N1-{2-methyl-4-[1,2,2,2-tetrafluor-1-(trifluoromethyl)ethyl]phenyl}-N2-(1-methyl-2-methylsulfonyl)phthalamid, (Z1009) methyl-2-[3,5-dibromo-2-([3-bromo-1-(3-chlorpyridin-2-yl)-1H-pyrazol-5-yl]carbonyl)amino)benzoyl]-1,2-dimethylhydrazinecarboxylate, (Z1010) N-[2-(5-amino-1,3,4-thiadiazol-2-yl)-4-chloro-6-methyl-phenyl]-5-bromo-2-(3-chloro-2-pyridyl)pyrazole-3-carboxamide, (Z1011) 5-chloro-2-(3-chloro-2-pyridyl)-N-[2,4-dichloro-6-[(1-cyano-1-methyl-ethyl)carbamoyl]phenyl]pyrazole-3-carboxamide, (Z1012) 5-bromo-N-[2,4-dichloro-6-(methylcarbamoyl)phenyl]-2-(3,5-dichloro-2-pyridyl)pyrazole-3-carboxamide, (Z1013) N-[2-(tert-butylcarbamoyl)-4-chloro-6-methyl-phenyl]-2-(3-chloro-2-pyridyl)-5-(fluoromethoxy)pyrazole-3-carboxamide, (Z1014) N2-(1-cyano-1-methyl-ethyl)-N1-(2,4-dimethylphenyl)-3-iodo-phthalamide; and 3-chloro-N2-(1-cyano-1-methyl-ethyl)-N1-(2,4-dimethylphenyl)phthalamide;
- (BB) GABA-gated chloride channel allosteric modulators, selected from the class of
- (BB1) Meta-diamides, for example, (BB1001) broflanilide;
- (BB2) Isoxazolines, for example, (BB2001) fluxametamide, (BB2002) isocycloseram, and
- (EE) Insecticidal active compounds of unknown or uncertain mode of action, for example, (EE1001) afidopyropen, (EE1002) azadirachtin, (EE1003) amidoflumet, (EE1004) benzoximate, (EE1005) benzpyrimoxan, (EE1006) bifenazate, (EE1007) bromopropylate, (EE1008) chinomethionat, (EE1009) cryolite, (EE1010) dicofol, (EE1011) flufenimer, (EE1012) flometoquin, (EE1013) fluhexafon, (EE1014) fluensulfone, (EE1015) flupyradifurone, (EE1016) lime sulphur, (EE1017) mancozeb, (EE1018) piperonyl butoxide, (EE1019) pyridalyl, (EE1020) pyrifluquinazon, (EE1021) sulfoxafloor, (EE1022) sulphur, (EE1023) 4-[5-(3,5-Dichloro-phenyl)-5-trifluoromethyl-4,5-dihydro-isoxazol-3-yl]-2-methyl-N-[(2,2,2-trifluoro-ethylcarbamoyl)-methyl]-benzamide, (EE1024) cyclopropaneacetic acid, (EE1025) 1,1'-[(3S,4R,4aR,6S,6aS,12R,12aS,12bS)-4-[(2-cyclopropylacetyl)oxy]methyl]-1,3,4,4a,5,6,6a,12,12a,12b-decahydro-12-hydroxy-4,6a,12b-trimethyl-11-oxo-9-(3-pyridinyl)-2H,11H-naphtho[2,1-b]pyrano[3,4-e]pyran-3,6-diyl]ester, (EE1026) 11-(4-chloro-2,6-dimethylphenyl)-12-hydroxy-1,4-dioxo-9-azadispiro[4.2.4.2]-tetradec-11-en-10-one, (EE1027) 4,3-(4'-fluoro-2,4-dimethylbiphenyl-3-yl)-4-hydroxy-8-oxa-1-azaspiro[4.5]dec-3-en-2-one, (EE1028) 1-[2-fluoro-4-methyl-5-[(2,2,2-trifluoroethyl)sulfinyl]phenyl]-3-(trifluoromethyl)-1H-1,2,4-triazole-5-amine, (EE1029) actives on basis of bacillus firmus (Votivo, II-1582), (EE1030) (E/Z)—N-[1-[(6-chloro-3-pyridyl)methyl]-2-pyridylidene]-2,2,2-trifluoro-acetamide, (EE1031) (E/Z)—N-[1-[(6-chloro-5-fluoro-3-pyridyl)methyl]-2-pyridylidene]-2,2,2-trifluoro-acetamide, (EE1032) (E/Z)-2,2,2-trifluoro-N-[1-[(6-fluoro-3-pyridyl)methyl]-2-pyridylidene]acetamide, (EE1033) (E/Z)—N-[1-[(6-

bromo-3-pyridyl)methyl]-2-pyridylidene]-2,2,2-trifluoro-acetamide, (EE1034) (E/Z)—N-[1-[1-(6-chloro-3-pyridyl)ethyl]-2-pyridylidene]-2,2,2-trifluoro-acetamide, (EE1035) (E/Z)—N-[1-[(6-chloro-3-pyridyl)methyl]-2-pyridylidene]-2,2-difluoro-acetamide, (EE1036) (E/Z)-2-chloro-N-[1-[(6-chloro-3-pyridyl)methyl]-2-pyridylidene]-2,2-difluoro-acetamide, (EE1037) (E/Z)—N-[1-[(6-chloropyrimidin-5-yl)methyl]-2-pyridylidene]-2,2,2-trifluoro-acetamide, (EE1038) (E/Z)—N-[1-[(6-chloro-3-pyridyl)methyl]-2-pyridylidene]-2,2,3,3,3-pentafluoro-propanamide), (EE1039) triflumezopyrim, (EE1040) 4-[5-[3-chloro-5-(trifluoromethyl)phenyl]-5-(trifluoromethyl)-4H-isoxazol-3-yl]-N-[2-oxo-2-(2,2,2-trifluoroethylamino)ethyl]naphthalene-1-carboxamide, (EE1041) 3-[3-chloro-5-(trifluoromethyl)phenyl]-4-oxo-1-(pyrimidin-5-ylmethyl)pyrido[1,2-a]pyrimidin-1-ium-2-olate, (EE1042) 8-chloro-N-[2-chloro-5-methoxyphenyl)sulfonyl]-6-trifluoromethyl)-imidazo[1,2-a]pyridine-2-carboxamide, (EE1043) 4-[5-(3,5-dichlorophenyl)-5-(trifluoromethyl)-4H-isoxazol-3-yl]-2-methyl-N-(1-oxothietan-3-yl)benzamide, (EE1044) 5-[3-[2,6-dichloro-4-(3,3-dichloroallyloxy)phenoxy]propoxy]-1H-pyrazole, (EE1045) dimpropyridaz, (EE1046) tyclopyrazoflor, (EE1047) nicofluprole, (EE1048) acynonapyr.

In an embodiment, the examples of fungicides may be selected from the following groups:

(A) Inhibitors of the sterol biosynthesis, for example, (A001) cyproconazole, (A002) difenoconazole, (A003) epoxiconazole, (A004) fenhexamid, (A005) fenpropidin, (A006) fenpropimorph, (A007) fenpyrazamine, (A008) fluquinconazole, (A009) flutriafol, (A010) imazalil, (A011) imazalil sulfate, (A012) ipconazole, (A013) metconazole, (A014) myclobutanil, (A015) paclobutrazol, (A016) prochloraz, (A017) propiconazole, (A018) prothioconazole, (A019) pyrisoxazole, (A020) spiroxamine, (A021) tebuconazole, (A022) tetraconazole, (A023) triadimenol, (A024) tridemorph, (A025) triticonazole, (A026) (1R,2S,5S)-5-(4-chlorobenzyl)-2-(chloromethyl)-2-methyl-1-(1H-1,2,4-triazol-1-ylmethyl)cyclopentanol, (A027) (1S,2R,5R)-5-(4-chlorobenzyl)-2-(chloromethyl)-2-methyl-1-(1H-1,2,4-triazol-1-ylmethyl)cyclopentanol, (A028) (2R)-2-(1-chlorocyclopropyl)-4-[(1R)-2,2-dichlorocyclopropyl]-1-(1H-1,2,4-triazol-1-yl)butan-2-ol, (A029) (2R)-2-(1-chlorocyclopropyl)-4-[(1S)-2,2-dichlorocyclopropyl]-1-(1H-1,2,4-triazol-1-yl)butan-2-ol, (A030) (2R)-2-[4-(4-chlorophenoxy)-2-(trifluoromethyl)phenyl]-1-(1H-1,2,4-triazol-1-yl)propan-2-ol, (A031) (2S)-2-(1-chlorocyclopropyl)-4-[(1R)-2,2-dichlorocyclopropyl]-1-(1H-1,2,4-triazol-1-yl)butan-2-ol, (A032) (2S)-2-(1-chlorocyclopropyl)-4-[(1S)-2,2-dichlorocyclopropyl]-1-(1H-1,2,4-triazol-1-yl)butan-2-ol, (A033) (2S)-2-[4-(4-chlorophenoxy)-2-(trifluoromethyl)phenyl]-1-(1H-1,2,4-triazol-1-yl)propan-2-ol, (A034) (R)-[3-(4-chloro-2-fluorophenyl)-5-(2,4-difluorophenyl)-1,2-oxazol-4-yl](pyridin-3-yl)methanol, (A035) (S)-[3-(4-chloro-2-fluorophenyl)-5-(2,4-difluorophenyl)-1,2-oxazol-4-yl](pyridin-3-yl)methanol, (A036) [3-(4-chloro-2-fluorophenyl)-5-(2,4-difluorophenyl)-1,2-oxazol-4-yl](pyridin-3-yl)methanol, (A037) 1-({(2R,4S)-2-[2-chloro-4-(4-chlorophenoxy)phenyl]-4-methyl-1,3-dioxolan-2-yl)methyl}-1H-1,2,4-triazole, (A038) 1-({(2S,4S)-2-[2-chloro-4-(4-chlorophenoxy)phenyl]-4-methyl-1,3-dioxolan-2-yl)methyl}-1H-1,2,4-triazole, (A039) 1-{{[3-(2-

- chlorophenyl)-2-(2,4-difluorophenyl)oxiran-2-yl)methyl}-1H-1,2,4-triazol-5-yl thiocyanate, (A040) 1-
 {[rel(2R,3R)-3-(2-chlorophenyl)-2-(2,4-difluorophenyl)oxiran-2-yl)methyl}-1H-1,2,4-triazol-5-yl
 thiocyanate, (A041) 1- {[rel(2R,3S)-3-(2-chlorophenyl)-2-(2,4-difluorophenyl)oxiran-2-yl)methyl}-
 1H-1,2,4-triazol-5-yl thiocyanate, (A042) 2- [(2R,4R,5R)-1-(2,4-dichlorophenyl)-5-
 5 hydroxy-2,6,6-trimethylheptan-4-yl]-2,4-dihydro-3H-1,2,4-triazole-3-thione, (A043) 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,
 (A044) 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, (A045) 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, (A046) 2-[(2S,4R,5R)-1-
 10 (2,4-dichlorophenyl)-5-hydroxy-2,6,6-trimethylheptan-4-yl]-2,4-dihydro-3H-1,2,4-triazole-3-thione,
 (A047) 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, (A048) 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, (A049) 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 (A050) 2-[1-(2,4-dichlorophenyl)-5-hydroxy-2,6,6-trimethylheptan-4-yl]-2,4-dihydro-3H-1,2,4-
 triazole-3-thione, (A051) 2-[2-chloro-4-(2,4-dichlorophenoxy)phenyl]-1-(1H-1,2,4-triazol-1-
 yl)propan-2-ol, (A052) 2-[2-chloro-4-(4-chlorophenoxy)phenyl]-1-(1H-1,2,4-triazol-1-yl)butan-2-ol,
 (A053) 2-[4-(4-chlorophenoxy)-2-(trifluoromethyl)phenyl]-1-(1H-1,2,4-triazol-1-yl)butan-2-ol,
 (A054) 2-[4-(4-chlorophenoxy)-2-(trifluoromethyl)phenyl]-1-(1H-1,2,4-triazol-1-yl)pentan-
 20 2-ol, (A055) 2-[4-(4-chlorophenoxy)-2-(trifluoromethyl)phenyl]-1-(1H-1,2,4-triazol-1-yl)propan-2-
 ol, (A056) 2- {[3-(2-chlorophenyl)-2-(2,4-difluorophenyl)oxiran-2-yl)methyl}-2,4-dihydro-3H-
 1,2,4-triazole-3-thione, (A057) 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, (A058) 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, (A059) 5-(4-
 25 chlorobenzyl)-2-(chloromethyl)-2-methyl-1-(1H-1,2,4-triazol-1-ylmethyl)cyclopentanol, (A060) 5-
 (allylsulfanyl)-1- {[3-(2-chlorophenyl)-2-(2,4-difluorophenyl)oxiran-2-yl)methyl}-1H-1,2,4-triazole,
 (A061) 5-(allylsulfanyl)-1- {[rel(2R,3R)-3-(2-chlorophenyl)-2-(2,4-difluorophenyl)oxiran-2-
 yl)methyl}-1H-1,2,4-triazole, (A062) 5-(allylsulfanyl)-1- {[rel(2R,3S)-3-(2-chlorophenyl)-2-(2,4-
 difluorophenyl)oxiran-2-yl)methyl}-1H-1,2,4-triazole, (A063) N'-(2,5-dimethyl-4- {[3-(1,1,2,2-
 30 tetrafluoroethoxy)phenyl]sulfanyl}phenyl)-N-ethyl-N-methylimidoforamamide, (A064) N'-(2,5-
 dimethyl-4- {[3-(2,2,2-trifluoroethoxy)phenyl]sulfanyl}phenyl)-N-ethyl-N-methylimidoforamamide,
 (A065) N'-(2,5-dimethyl-4- {[3-(2,2,3,3-tetrafluoropropoxy)phenyl]sulfanyl}phenyl)-N-ethyl-
 N-methylimidoforamamide, (A066) N'-(2,5-dimethyl-4- {[3-
 (pentafluoroethoxy)phenyl]sulfanyl}phenyl)-N-ethyl-N-methylimidoforamamide, (A067) N'-(2,5-
 35 dimethyl-4- {[3-[(1,1,2,2-tetrafluoroethyl)sulfanyl]phenoxy}phenyl)-N-ethyl-
 N-methylimidoforamamide, (A068) N'-(2,5-dimethyl-4- {[3-[(2,2,2-
 trifluoroethyl)sulfanyl]phenoxy}phenyl)-N-ethyl-N-methylimidoforamamide, (A069) N'-(2,5-

- dimethyl-4-{3-[(2,2,3,3-tetrafluoropropyl)sulfanyl]phenoxy}phenyl)-N-ethyl-N-methylimidofornamide, (A070) N'-(2,5-dimethyl-4-{3-[(pentafluoroethyl)sulfanyl]phenoxy}phenyl)-N-ethyl-N-methylimidofornamide, (A071) N'-(2,5-dimethyl-4-phenoxyphenyl)-N-ethyl-N-methylimidofornamide, (A072) N'-(4-{3-[(difluoromethoxy)phenyl]sulfanyl}-2,5-dimethylphenyl)-N-ethyl-N-methylimidofornamide, (A073) N'-(4-{3-[(difluoromethyl)sulfanyl]phenoxy}-2,5-dimethylphenyl)-N-ethyl-N-methylimidofornamide, (A074) N'-[5-bromo-6-(2,3-dihydro-1H-inden-2-yloxy)-2-methylpyridin-3-yl]-N-ethyl-N-methylimidofornamide, (A075) N'-{4-[(4,5-dichloro-1,3-thiazol-2-yl)oxy]-2,5-dimethylphenyl}-N-ethyl-N-methylimidofornamide, (A076) N'-{5-bromo-6-[(1R)-1-(3,5-difluorophenyl)ethoxy]-2-methylpyridin-3-yl}-N-ethyl-N-methylimidofornamide, (A077) N'-{5-bromo-6-[(1S)-1-(3,5-difluorophenyl)ethoxy]-2-methylpyridin-3-yl}-N-ethyl-N-methylimidofornamide, (A078) N'-{5-bromo-6-[(cis-4-isopropylcyclohexyl)oxy]-2-methylpyridin-3-yl}-N-ethyl-N-methylimidofornamide, (A079) N'-{5-bromo-6-[(trans-4-isopropylcyclohexyl)oxy]-2-methylpyridin-3-yl}-N-ethyl-N-methylimidofornamide, (A080) N'-{5-bromo-6-[1-(3,5-difluorophenyl)ethoxy]-2-methylpyridin-3-yl}-N-ethyl-N-methylimidofornamide, (A081) mefentrifluconazole, (A082) ipfentrifluconazole, (A083) 1-(2,4-difluorophenyl)-2-(1H-1,2,4-triazol-1-yl)-1-[1-(2,6-difluoro-4-chlorophenoxy)cyclopropyl]ethanol, (A084) 1-[2-(1-chlorocyclopropyl)-3-(2-fluorophenyl)-2-hydroxypropyl]-1H-imidazole-5-carbonitrile, (A085) terbinafine, (A086) buthiobate, (A087) pyrifenoxy, (A088) fenarimol, (A089) nuarimol, (A090) triarimol, (A091) triforine, (A092) clotrimazole, (A093) econazole, (A094) isoconazole, (A095) miconazole, (A096) oxpoconazole, (A097) pefurazoate, (A098) triflumizole, (A099) azaconazole, (A100) bitertanol, (A101) bromuconazole, (A102) diniconazole, (A103) diniconazole-M, (A104) etaconazole, (A105) fenbuconazole, (A106) hexaconazole, (A107) imibenconazole, (A108) penconazole, (A109) simeconazole, (A110) triadimefon, (A111) uniconazole, (A112) pyributicarb, (A113) dodemorph, (A114) aldimorph, (A115) trimorphamide, (A116) piperalin, (A117) naftifine;
- (B) Inhibitors of the respiratory chain at complex I or II, for example, (B001) benzovindiflupyr, (B002) bixafen, (B003) boscalid, (B004) carboxin, (B005) fluopyram, (B006) flutolanil, (B007) fluxapyroxad, (B008) furametpyr, (B009) isofetamid, (B010) isopyrazam (anti-epimeric enantiomer 1R,4S,9S), (B011) isopyrazam (anti-epimeric enantiomer 1S,4R,9R), (B012) isopyrazam (anti-epimeric racemate 1RS,4SR,9SR), (B013) isopyrazam (mixture of syn-epimeric racemate 1RS,4SR,9RS and anti-epimeric racemate 1RS,4SR,9SR), (B014) isopyrazam (syn-epimeric enantiomer 1R,4S,9R), (B015) isopyrazam (syn-epimeric enantiomer 1S,4R,9S), (B016) isopyrazam (syn-epimeric racemate 1RS,4SR,9RS), (B017) penflufen, (B018) penhiopyrad, (B019) pydiflumetofen, (B020) pyraziflumid, (B021) sedaxane, (B022) 1,3-dimethyl-N-(1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl)-1H-pyrazole-4-carboxamide, (B023) 1,3-dimethyl-N-[(3R)-1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl]-1H-pyrazole-4-carboxamide, (B024) 1,3-dimethyl-N-[(3S)-1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl]-1H-pyrazole-4-carboxamide, (B025) 1-methyl-3-

(trifluoromethyl)-N-[2'-(trifluoromethyl)biphenyl-2-yl]-1H-pyrazole-4-carboxamide, (B026) 2-fluoro-6-(trifluoromethyl)-N-(1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl)benzamide, (B027) 3-(difluoromethyl)-1-methyl-N-(1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl)-1H-pyrazole-4-carboxamide, (B028) 3-(difluoromethyl)-1-methyl-N-[(3R)-1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl]-1H-pyrazole-4-carboxamide (inpyrfluxam), (B029) 3-(difluoromethyl)-1-methyl-N-[(3S)-1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl]-1H-pyrazole-4-carboxamide, (B030) 3-(difluoromethyl)-N-(7-fluoro-1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl)-1-methyl-1H-pyrazole-4-carboxamide (Fluindapyr), (B031) 3-(difluoromethyl)-N-[(3R)-7-fluoro-1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl]-1-methyl-1H-pyrazole-4-carboxamide, (B032) 3-(difluoromethyl)-N-[(3S)-7-fluoro-1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl]-1-methyl-1H-pyrazole-4-carboxamide, (B033) 5,8-difluoro-N-[2-(2-fluoro-4-{[4-(trifluoromethyl)pyridin-2-yl]oxy}phenyl)ethyl]quinazolin-4-amine, (B034) N-(2-cyclopentyl-5-fluorobenzyl)-N-cyclopropyl-3-(difluoromethyl)-5-fluoro-1-methyl-1H-pyrazole-4-carboxamide, (B035) N-(2-tert-butyl-5-methylbenzyl)-N-cyclopropyl-3-(difluoromethyl)-5-fluoro-1-methyl-1H-pyrazole-4-carboxamide, (B036) N-(2-tert-butylbenzyl)-N-cyclopropyl-3-(difluoromethyl)-5-fluoro-1-methyl-1H-pyrazole-4-carboxamide, (B037) N-(5-chloro-2-ethylbenzyl)-N-cyclopropyl-3-(difluoromethyl)-5-fluoro-1-methyl-1H-pyrazole-4-carboxamide, (B038) N-(5-chloro-2-isopropylbenzyl)-N-cyclopropyl-3-(difluoromethyl)-5-fluoro-1-methyl-1H-pyrazole-4-carboxamide (isoflucpyram), (B039) N-[(1R,4S)-9-(dichloromethylene)-1,2,3,4-tetrahydro-1,4-methanonaphthalen-5-yl]-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide, (B040) N-[(1S,4R)-9-(dichloromethylene)-1,2,3,4-tetrahydro-1,4-methanonaphthalen-5-yl]-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide, (B041) N-[1-(2,4-dichlorophenyl)-1-methoxypropan-2-yl]-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide, (B042) N-[2-chloro-6-(trifluoromethyl)benzyl]-N-cyclopropyl-3-(difluoromethyl)-5-fluoro-1-methyl-1H-pyrazole-4-carboxamide, (B043) N-[3-chloro-2-fluoro-6-(trifluoromethyl)benzyl]-N-cyclopropyl-3-(difluoromethyl)-5-fluoro-1-methyl-1H-pyrazole-4-carboxamide, (B044) N-[5-chloro-2-(trifluoromethyl)benzyl]-N-cyclopropyl-3-(difluoromethyl)-5-fluoro-1-methyl-1H-pyrazole-4-carboxamide, (B045) N-cyclopropyl-3-(difluoromethyl)-5-fluoro-1-methyl-N-[5-methyl-2-(trifluoromethyl)benzyl]-1H-pyrazole-4-carboxamide, (B046) N-cyclopropyl-3-(difluoromethyl)-5-fluoro-N-(2-fluoro-6-isopropylbenzyl)-1-methyl-1H-pyrazole-4-carboxamide, (B047) N-cyclopropyl-3-(difluoromethyl)-5-fluoro-N-(2-isopropyl-5-methylbenzyl)-1-methyl-1H-pyrazole-4-carboxamide, (B048) N-cyclopropyl-3-(difluoromethyl)-5-fluoro-N-(2-isopropylbenzyl)-1-methyl-1H-pyrazole-4-carbothioamide, (B049) N-cyclopropyl-3-(difluoromethyl)-5-fluoro-N-(2-isopropylbenzyl)-1-methyl-1H-pyrazole-4-carboxamide, (B050) N-cyclopropyl-3-(difluoromethyl)-5-fluoro-N-(5-fluoro-2-isopropylbenzyl)-1-methyl-1H-pyrazole-4-carboxamide, (B051) N-cyclopropyl-3-(difluoromethyl)-N-(2-ethyl-4,5-dimethylbenzyl)-5-fluoro-1-methyl-1H-pyrazole-4-carboxamide, (B052) N-cyclopropyl-3-(difluoromethyl)-N-(2-ethyl-5-fluorobenzyl)-5-fluoro-1-methyl-1H-pyrazole-4-carboxamide, (B053) N-cyclopropyl-3-(difluoromethyl)-N-(2-ethyl-5-methylbenzyl)-5-fluoro-1-methyl-1H-

- pyrazole-4-carboxamide, (B054) N-cyclopropyl-N-(2-cyclopropyl-5-fluorobenzyl)-3-(difluoromethyl)-5-fluoro-1-methyl-1H-pyrazole-4-carboxamide, (B055) N-cyclopropyl-N-(2-cyclopropyl-5-methylbenzyl)-3-(difluoromethyl)-5-fluoro-1-methyl-1H-pyrazole-4-carboxamide, (B056) N-cyclopropyl-N-(2-cyclopropylbenzyl)-3-(difluoromethyl)-5-fluoro-1-methyl-1H-pyrazole-4-carboxamide, (B057) 2-(difluoromethyl)-N-(1,1-dimethyl-3-propyl-2,3-dihydro-1H-inden-4-yl)nicotinamide, (B058) pyrapropoyne, (B059) inpyrfluxam, (B060) mepronil, (B061) isoflucypram, (B062) oxycarboxin, (B063) α -(methoxyimino)-N-methyl-2-[[[1-[3-(trifluoromethyl)phenyl]ethoxy]imino]methyl]benzeneacetamide, (B064) diflumetorim, (B065) thifluzamide, (B066) fenfuram, (B067) benodanil;
- 10 (C) Inhibitors of the respiratory chain at complex III, for example, (C001) ametocetradin, (C002) amisulbrom, (C003) azoxystrobin, (C004) coumethoxystrobin, (C005) coumoxystrobin, (C006) cyazofamid, (C007) dimoxystrobin, (C008) enoxastrobin, (C009) famoxadone, (C010) fenamidone, (C011) flufenoxystrobin, (C012) fluoxastrobin, (C013) kresoxim-methyl, (C014) metominostrobin, (C015) orysastrobin, (C016) picoxystrobin, (C017) pyraclostrobin, (C018) pyrametostrobin, (C019)
- 15 pyraoxystrobin, (C020) trifloxystrobin, (C021) (2E)-2-{2-[[[1-(1E)-1-(3-{[(E)-1-fluoro-2-phenylvinyl]oxy} phenyl)ethylidene]amino]oxy)methyl]phenyl}-2-(methoxyimino)-N-methylacetamide, (C022) (2E,3Z)-5-{[1-(4-chlorophenyl)-1H-pyrazol-3-yl]oxy}-2-(methoxyimino)-N,3-dimethylpent-3-enamide, (C023) (2R)-2-{2-[(2,5-dimethylphenoxy)methyl]phenyl}-2-methoxy-N-methylacetamide, (C024) (2S)-2-{2-[(2,5-dimethylphenoxy)methyl]phenyl}-2-methoxy-N-
- 20 methylacetamide, (C025) (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 (Fenpicoxamid), (C026) 2-{2-[(2,5-dimethylphenoxy)methyl]phenyl}-2-methoxy-N-methylacetamide (Mandestrobin), (C027) N-(3-ethyl-3,5,5-trimethylcyclohexyl)-3-formamido-2-hydroxybenzamide, (C028) (2E,3Z)-5-{[1-(4-chloro-2-fluorophenyl)-1H-pyrazol-3-yl]oxy}-2-(methoxyimino)-N,3-
- 25 dimethylpent-3-enamide, (C029) methyl {5-[3-(2,4-dimethylphenyl)-1H-pyrazol-1-yl]-2-methylbenzyl}carbamate, (C030) 1-(2-{[1-(4-chlorophenyl)pyrazol-3-yl]oxymethyl}-3-methylphenyl)-1,4-dihydro-4-methyl-5H-tetrazol-5-one (Metyltetraprole), (C031) florylpicoxamid, (C032) pyribencarb, (C033) α -(methoxyimino)-N-methyl-2-[[[1-[3-(trifluoromethyl)phenyl]ethoxy]imino]methyl]benzeneacetamide, (C034) metarylpicoxamid;
- 30 (D) Inhibitors of the mitosis and cell division, for example, (D001) carbendazim, (D002) diethofencarb, (D003) ethaboxam, (D004) fluopicolide, (D005) pencycuron, (D006) thiabendazole, (D007) thiophanate-methyl, (D008) zoxamide, (D009) 3-chloro-4-(2,6-difluorophenyl)-6-methyl-5-phenylpyridazine, (D010) 3-chloro-5-(4-chlorophenyl)-4-(2,6-difluorophenyl)-6-methylpyridazine, (D011) 3-chloro-5-(6-chloropyridin-3-yl)-6-methyl-4-(2,4,6-
- 35 trifluorophenyl)pyridazine, (D012) 4-(2-bromo-4-fluorophenyl)-N-(2,6-difluorophenyl)-1,3-dimethyl-1H-pyrazol-5-amine, (D013) 4-(2-bromo-4-fluorophenyl)-N-(2-bromo-6-fluorophenyl)-1,3-dimethyl-

- 1H-pyrazol-5-amine, (D014) 4-(2-bromo-4-fluorophenyl)-N-(2-bromophenyl)-1,3-dimethyl-1H-pyrazol-5-amine, (D015) 4-(2-bromo-4-fluorophenyl)-N-(2-chloro-6-fluorophenyl)-1,3-dimethyl-1H-pyrazol-5-amine, (D016) 4-(2-bromo-4-fluorophenyl)-N-(2-chlorophenyl)-1,3-dimethyl-1H-pyrazol-5-amine, (D017) 4-(2-bromo-4-fluorophenyl)-N-(2-fluorophenyl)-1,3-dimethyl-1H-pyrazol-5-amine, (D018) 4-(2-chloro-4-fluorophenyl)-N-(2,6-difluorophenyl)-1,3-dimethyl-1H-pyrazol-5-amine, (D019) 4-(2-chloro-4-fluorophenyl)-N-(2-chloro-6-fluorophenyl)-1,3-dimethyl-1H-pyrazol-5-amine, (D020) 4-(2-chloro-4-fluorophenyl)-N-(2-chlorophenyl)-1,3-dimethyl-1H-pyrazol-5-amine, (D021) 4-(2-chloro-4-fluorophenyl)-N-(2-fluorophenyl)-1,3-dimethyl-1H-pyrazol-5-amine, (D022) 4-(4-chlorophenyl)-5-(2,6-difluorophenyl)-3,6-dimethylpyridazine, (D023) N-(2-bromo-6-fluorophenyl)-4-(2-chloro-4-fluorophenyl)-1,3-dimethyl-1H-pyrazol-5-amine, (D024) N-(2-bromophenyl)-4-(2-chloro-4-fluorophenyl)-1,3-dimethyl-1H-pyrazol-5-amine, (D025) N-(4-chloro-2,6-difluorophenyl)-4-(2-chloro-4-fluorophenyl)-1,3-dimethyl-1H-pyrazol-5-amine, (D026) benomyl;
- (E) Compounds capable of having a multisite action, for example, (E001) bordeaux mixture, (E002) captafol, (E003) captan, (E004) chlorothalonil, (E005) copper hydroxide, (E006) copper naphthenate, (E007) copper oxide, (E008) copper oxychloride, (E009) copper sulfate, (E010) dithianon, (E011) dodine, (E012) folpet, (E013) mancozeb, (E014) maneb, (E015) metiram, (E016) metiram zinc, (E017) oxine-copper, (E018) propineb, (E019) sulfur and sulfur preparations including calcium polysulfide, (E020) thiram, (E021) zineb, (E022) ziram, (E023) 6-ethyl-5,7-dioxo-6,7-dihydro-5H-pynolo[3',4':5,6][1,4]dithiino[2,3-c][1,2]thiazole-3-carbonitrile, (E024) ferbam, (E025) dichlofluanid, (E026) tolylfluanid, (E027) guazatine, (E028) iminoctadine, (E029) anilazine, (E030) quinomethionate;
- (F) Compounds capable of inducing a host defense, for example, (F001) acibenzolar-S-methyl, (F002) isotianil, (F003) probenazole, (F004) tiadinil;
- (G) Inhibitors of the amino acid and/or protein biosynthesis, for example, (G001) cyprodinil, (G002) kasugamycin, (G003) kasugamycin hydrochloride hydrate, (G004) oxytetracycline, (G005) pyrimethanil, (G006) 3-(5-fluoro-3,3,4,4-tetramethyl-3,4-dihydroisoquinolin-1-yl)quinoline, (G007) fuberidazole, (G008) thiophanate, (G009) blasticidin-S, (G010) streptomycin, (G011) mepanipyrim;
- (H) Inhibitors of the ATP production, for example, (H001) silthiofam, (H002) fentin acetate, (H003) fentin chloride, (H004) fentin hydroxide;
- (I) Inhibitors of the cell wall synthesis, for example, (I001) benthiavalicarb, (I002) dimethomorph, (I003) flumorph, (I004) iprovalicarb, (I005) mandipropamid, (I006) pyrimorph, (I007) valifenalate, (I008) (2E)-3-(4-tert-butylphenyl)-3-(2-chloropyridin-4-yl)-1-(morpholin-4-yl)prop-2-en-1-one, (I009) (2Z)-3-(4-tert-butylphenyl)-3-(2-chloropyridin-4-yl)-1-(morpholin-4-yl)prop-2-en-1-one, (I010) benthiavalicarb-isopropyl, (I011) polyoxins, (I012) N-[2-[4-[[3-(4-chlorophenyl)-2-propyn-1-yl]oxy]-3-, (I013) methoxyphenyl]ethyl]-3-methyl-2-[(methylsulfonyl)-amino]butanamide, (I014) N-

[2-[4-[[3-(4-chlorophenyl)-2-propyn-1-yl]oxy]-3-methoxyphenyl]-ethyl]-3-methyl-2-[(ethylsulfonyl)amino]butanamide;

(J) Inhibitors of the lipid and membrane synthesis, for example, (J001) propamocarb, (J002) propamocarb hydrochloride, (J003) tolelofos-methyl, (J004) difenphos, (J005) iodocarb, (J006) prothiocarb, (J007) edifenphos, (J008) iprobenfos, (J009) pyrazophos, (J010) isoprothiolane, (J011) etridiazole, (J012) biphenyl, (J013) chloroneb, (J014) dicloran, (J015) quintozone, (J016) tecnazene;

(K) Inhibitors of the melanine biosynthesis, for example, (K001) tricyclazole, (K002) 2,2,2-trifluoroethyl {3-methyl-1-[(4-methylbenzoyl)amino]butan-2-yl}carbamate, (K003) carpropamid, (K004) diclocymet, (K005) fenoxanil, (K006) fthalide, (K007) pyroquilon;

(L) Inhibitors of the nucleic acid synthesis, for example, (L001) benalaxyl, (L002) benalaxyl-M (kiralaxyl), (L003) metalaxyl, (L004) metalaxyl-M (mefenoxam), (L005) ethirimol, (L006) furalaxyl, (L007) ofurace, (L008) oxolinic acid, (L009) hymexazole, (L010) octhilinone, (L011) bupirimate, (L012) dimethirimol;

(M) Inhibitors of the signal transduction, for example, (M001) fludioxonil, (M002) iprodione, (M003) procymidone, (M004) proquinazid, (M005) quinoxifen, (M006) vinclozolin, (M007) chlozolate, (M008) fenpiclonil, (M009) proquinazid, (M010) 2-butoxy-6-iodo-3-propyl-4H-1-benzopyran-4-one;

(N) Compounds capable of acting as uncoupler, for example, (N001) fluazinam, (N002) meptyldinocap, (N003) binapacryl, (N004) dinocap;

(O) Other fungicides, for example, (O001) abscisic acid, (O002) benthiazole, (O003) bethoxazin, (O004) capsimidin, (O005) carvone, (O006) chinomethionat, (O007) cufraneb, (O008) cyflufenamid, (O009) cymoxanil, (O010) cyprosulfamide, (O011) flutianil, (O012) fosetyl-aluminium, (O013) fosetyl-calcium, (O014) fosetyl-sodium, (O015) methyl isothiocyanate, (O016) metrafenone, (O017) mildiomicin, (O018) natamycin, (O019) nickel dimethyldithiocarbamate, (O020) nitrothal-isopropyl, (O021) oxamocarb, (O022) oxathiapiprolin, (O023) oxyfenthiin, (O024) pentachlorophenol and salts, (O025) phosphorous acid and its salts, (O026) propamocarb-fosetilate, (O027) pyriofenone (chlazafenone), (O028) tebufloquin, (O029) tecloftalam, (O030) tolnifanide, (O031) 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, (O032) 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, (O033) 2-(6-benzylpyridin-2-yl)quinazoline, (O034) 2,6-dimethyl-1H,5H-[1,4]dithiino[2,3-c:5,6-c']dipyrrole-1,3,5,7(2H,6H)-tetrone, (O035) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)ethanone, (O036) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-chloro-6-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)ethanone,

- (O037) 2-[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]-1-[4-(4-{5-[2-fluoro-6-(prop-2-yn-1-yloxy)phenyl]-4,5-dihydro-1,2-oxazol-3-yl}-1,3-thiazol-2-yl)piperidin-1-yl]ethanone, (O038) 2-[6-(3-fluoro-4-methoxyphenyl)-5-methylpyridin-2-yl]quinazoline, (O039) 2-[(5R)-3-[2-(1-{[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]acetyl}piperidin-4-yl)-1,3-thiazol-4-yl]-4,5-dihydro-1,2-oxazol-5-yl]-3-chlorophenyl methanesulfonate, (O040) 2-[(5S)-3-[2-(1-{[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]acetyl}piperidin-4-yl)-1,3-thiazol-4-yl]-4,5-dihydro-1,2-oxazol-5-yl]-3-chlorophenyl methanesulfonate, (O041) 2-{2-[(7,8-difluoro-2-methylquinolin-3-yl)oxy]-6-fluorophenyl}propan-2-ol, (O042) 2-{2-fluoro-6-[(8-fluoro-2-methylquinolin-3-yl)oxy]phenyl}propan-2-ol, (O043) 2-{3-[2-(1-{[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]acetyl}piperidin-4-yl)-1,3-thiazol-4-yl]-4,5-dihydro-1,2-oxazol-5-yl]-3-chlorophenyl methanesulfonate (fluoxapiprolin), (O044) 2-{3-[2-(1-{[3,5-bis(difluoromethyl)-1H-pyrazol-1-yl]acetyl}piperidin-4-yl)-1,3-thiazol-4-yl]-4,5-dihydro-1,2-oxazol-5-yl}phenyl methanesulfonate, (O045) 2-phenylphenol and salts, (O046) 3-(4,4,5-trifluoro-3,3-dimethyl-3,4-dihydroisoquinolin-1-yl)quinoline, (O047) 3-(4,4-difluoro-3,3-dimethyl-3,4-dihydroisoquinolin-1-yl)quinoline (Quinofumelin), (O048) 4-amino-5-fluoropyrimidin-2-ol (tautomeric form: 4-amino-5-fluoropyrimidin-2(1H)-one), (O049) 4-oxo-4-[(2-phenylethyl)amino]butanoic acid, (O050) 5-amino-1,3,4-thiadiazole-2-thiol, (O051) 5-chloro-N'-phenyl-N'-(prop-2-yn-1-yl)thiophene-2-sulfonohydrazide, (O052) 5-fluoro-2-[(4-fluorobenzyl)oxy]pyrimidin-4-amine, (O053) 5-fluoro-2-[(4-methylbenzyl)oxy]pyrimidin-4-amine, (O054) 9-fluoro-2,2-dimethyl-5-(quinolin-3-yl)-2,3-dihydro-1,4-benzoxazepine, (O055) but-3-yn-1-yl{6-[[[(Z)-(1-methyl-1H-tetrazol-5-yl)(phenyl)methylene]amino]oxy)methyl}pyridin-2-yl}carbamate, (O056) ethyl (2Z)-3-amino-2-cyano-3-phenylacrylate, (O057) phenazine-1-carboxylic acid, (O058) propyl 3,4,5-trihydroxybenzoate, (O059) quinolin-8-ol, (O060) quinolin-8-ol sulfate (2:1), (O061) tert-butyl {6-[[[(1-methyl-1H-tetrazol-5-yl)(phenyl)methylene]amino]oxy)methyl}pyridin-2-yl}carbamate, (O062) 5-fluoro-4-imino-3-methyl-1-[(4-methylphenyl)sulfonyl]-3,4-dihydropyrimidin-2(1H)-one, (O063) pyridachlometyl, (O064) ipflufenquin, (O065) aminopyrifin, (O066) N-[[[(cyclopropyl-methoxy)amino][6-(difluoromethoxy)-2,3-difluorophenyl]-methylene]benzeneacetamide, (O067) methasulfocarb, (O068) nabam, (O069) oxine copper, (O070) ditalimfos, (O071) drazoxolon, (O072) tolyfluanide, (O073) diclobutrazol, (O074) cyprofuram, (O075) phosphorous acid and salts, (O076) ferimzone, (O077) pyrrolnitrin, (O078) triazoxide, (O079) flusulfamide, (O080) diclomezine, (O081) mineral oils, (O082) organic oils, (O083) inorganic oils, (O084) potassium bicarbonate, (O085) ferric methanearsonate, (O086) 4-fluorophenyl-N-[1-[[[1-(4-cyanophenyl)ethyl]sulfonyl]methyl]propyl]carbamate, (O087) 5-chloro-6-(2,4,6-trifluorophenyl)-7-(4-methylpiperidin-1-yl)[1,2,4]triazolo[1,5-a]pyrimidine, (O088) N-[4-[4-chloro-3-(trifluoromethyl)phenoxy]-2,5-dimethylphenyl]-N-ethyl-N-methylmethanimidamide;
- (P) HDAC inhibitors, for example, (P001) N-(1-ethylcyclopropyl)-4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]benzamide; (P002) N-(2-isopropylcyclopropyl)-4-[5-(trifluoromethyl)-1,2,4-oxadiazol-

- 3-yl]benzamide; (P003) N-(2-methylcyclopropyl)-4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]benzamide; (P004) N-(1-methylcyclopropyl)-4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]benzamide; (P005) N-(2-ethylcyclopropyl)-4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]benzamide; (P006) N-(2,4-difluorophenyl)-4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]benzamide; (P007) 5-(trifluoromethyl)-3-[4-[[3-(trifluoromethyl)-1,2,4-triazol-1-yl]methyl]phenyl]-1,2,4-oxadiazole; (P008) 2-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]-1,2,4-triazole-3-carbonitrile; (P009) ethyl 1-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]pyrazole-4-carboxylate; (P010) N-cyclopropyl-1-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]pyrazole-4-carboxamide; (P011) N,N-dimethyl-1-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]pyrazole-4-carboxamide; (P012) N-methyl-1-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]pyrazole-4-carboxamide; (P013) N,N-dimethyl-H[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]-1,2,4-triazol-3-amine; (P014) 3-[4-[(5-ethylsulfanyl-1,2,4-triazol-1-yl)methyl]phenyl]-5-(trifluoromethyl)-1,2,4-oxadiazole; (P015) 3-[4-(triazolo[4,5-b]pyridin-1-ylmethyl)phenyl]-5-(trifluoromethyl)-1,2,4-oxadiazole; (P016) 3-[4-(triazolo[4,5-b]pyridin-2-ylmethyl)phenyl]-5-(trifluoromethyl)-1,2,4-oxadiazole; (P017) 3-[4-(triazolo[4,5-b]pyridin-3-ylmethyl)phenyl]-5-(trifluoromethyl)-1,2,4-oxadiazole; (P018) methyl 1-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]pyrazole-4-carboxylate; (P019) ethyl 1-[[3-fluoro-4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]pyrazole-4-carboxylate; (P020) N,N-diethyl-1-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]pyrazole-4-carboxamide; (P021) N-methoxy-N-methyl-1-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]pyrazole-4-carboxamide; (P022) propyl 1-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]pyrazole-4-carboxylate; (P023) N-methoxy-1-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]pyrazole-4-carboxamide; (P024) N-ethyl-1-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]pyrazole-4-carboxamide; (P025) 1-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]pyrazole-4-carboxamide; (P026) N-methoxy-1-[1-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]pyrazol-4-yl]methanimine; (P027) ethyl 1-[1-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]ethyl]pyrazole-4-carboxylate; (P028) 1-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]pyrrolidin-2-one; (P029) 1-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]piperidin-2-one; (P030) 4-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]morpholin-3-one; (P031) 4,4-dimethyl-2-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]isoxazolidin-3-one; (P032) 2-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]isoxazolidin-3-one; (P033) 5,5-dimethyl-2-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]isoxazolidin-3-one; (P034) 3,3-dimethyl-1-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]piperidin-2-one; (P035) 1-[[2-fluoro-4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]pyrrolidin-2-one; (P036) 1-[[2-fluoro-4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]piperidin-2-one; (P037) 2-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]oxazinan-3-one; (P038) 1-[[3-fluoro-4-[5-

(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]piperidin-2-one; (P039) 3-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]oxazolidin-2-one; (P040) 1-methyl-3-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]imidazolidin-2-one; (P041) 1-[[3-fluoro-4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]-3,3-dimethyl-piperidin-2-one; (P042) 1-[[3-fluoro-4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]pyrrolidin-2-one; (P043) 2-[[3-fluoro-4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]-4,4-dimethyl-isoxazolidin-3-one; (P044) 2-[[2,3-difluoro-4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]isoxazolidin-3-one; (P045) 2-[[3-fluoro-4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]isoxazolidin-3-one; (P046) 1-[[3-fluoro-4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]azepan-2-one; (P047) N-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]propanamide; (P048) 2,2-dimethyl-N-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]but-3-ynamide; (P049) N-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]butanamide; (P050) 3-methyl-N-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]butanamide; (P051) 2-methyl-N-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]prop-2-enamide; (P052) 2-methyl-N-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]butanamide; (P053) 2-methoxy-N-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]; (P054) 3,3,3-trifluoro-N-[[3-fluoro-4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]propanamide; (P055) 3,3,3-trifluoro-N-[[2-fluoro-4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]propanamide; (P056) N-[[2,3-difluoro-4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]butanamide; (P057) N-[[2,3-difluoro-4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]-3,3,3-trifluoro-propanamide; (P058) 2-(difluoromethoxy)-N-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]acetamide; (P059) 2-methoxy-2-methyl-N-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]propanamide; (P060) 1-methyl-3-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]urea; (P061) 1-ethyl-1-methyl-3-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]urea; (P062) 1-ethoxy-3-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]urea; (P063) 1-methoxy-1-methyl-3-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]; (P064) 1,1-diethyl-3-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]urea; (P065) N-methoxy-N-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]cyclopropanecarboxamide; (P066) N-methoxy-N-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]pent-4-ynamide; (P067) N-methoxy-2-methyl-N-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]prop-2-enamide; (P068) N,2-dimethoxy-N-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]propanamide; (P069) N-cyclopropyl-3,3,3-trifluoro-N-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]propanamide; (P070) 2,2-difluoro-N-(2-methoxyethyl)-N-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]cyclopropanecarboxamide; (P071) N-ethyl-2-methyl-N-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]propanamide; (P072) N-[[3-fluoro-4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]-N-methoxy-propanamide; (P073) 2-methoxy-N-(2,2,2-trifluoroethyl)-N-[[4-[5-

- (trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl] acetamide; (P074) N-[[2,3-difluoro-4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]-N-methoxy-cyclopropane carboxamide; (P075) 2-(difluoromethoxy)-N-methyl-N-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]acetamide; (P076) N-ethoxy-2-methoxy-N-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]propanamide; (P077) N-isopropyl-N-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]tetrahydrofuran-2-carboxamide; (P078) 1-methoxy-3-methyl-1-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]urea; (P079) 3-cyclopropyl-1-methoxy-1-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]urea; (P080) 3-ethoxy-1-methoxy-1-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]urea; (P081) 3-allyl-1-methoxy-1-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]urea; (P082) 1-cyclopropyl-3-methoxy-3-methyl-1-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]urea; (P083) 3-isopropyl-1-methoxy-1-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]urea; (P084) 1-methoxy-3-prop-2-ynyl-1-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]urea; (P085) 1-[[3-fluoro-4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]-1-methoxy-3-methyl-urea; (P086) 3-(cyclopropylmethyl)-1-methyl-1-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]urea; (P087) 1-ethyl-3-(2,2,2-trifluoroethyl)-1-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]urea; (P088) 1,3-dimethoxy-1-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]urea; (P089) 3-ethyl-1-methoxy-1-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]urea; (P090) N-methyl-4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]benzamide; (P091) N-[(E)-methoxyiminomethyl]-4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]benzamide; (P092) N-[(Z)-methoxyiminomethyl]-4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]benzamide; (P093) N-[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]cyclopropanecarboxamide; (P094) N-(2-fluorophenyl)-4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]benzamide; (P095) 2,2-difluoro-N-methyl-2-[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]acetamide; (P096) N-allyl-N-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]acetamide; (P097) N-[(E)-N-methoxy-C-methyl-carbonimidoyl]-4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]benzamide; (P098) N-[(Z)-N-methoxy-C-methyl-carbonimidoyl]-4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]benzamide; (P100) N-allyl-N-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]propanamide; (P101) 4,4-dimethyl-1-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]pyrrolidin-2-one; (P102) N-methyl-4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]benzenecarbothioamide; (P103) 5-methyl-1-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl)methyl]pyrrolidin-2-one; (P104) N-methyl-4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]benzenecarboxamide; (P105) N1-methyl-N2-(4-(5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl)benzyl)oxalamide;
- (Q) Compounds capable to act as a safener, for example, (Q001) 1-(2,4-dichlorophenyl)-5-(ethoxycarbonyl)-5-methyl-2-pyrazoline-3-carboxylic acid, (Q002) ethyl 1-(2,4-dichlorophenyl)-5-(ethoxycarbonyl)-5-methyl-2-pyrazoline-3-carboxylate ("mefenpyr (-diethyl)"), (Q003) benoxacor,

(Q004) cloquintocet-mexyl, (Q005) cumyluron, (Q006) cyometrinil, (Q007) daimuron, (Q008) dichlormid, (Q009) dicyclonon, (Q010) dietholate, (Q011) dimepiperate, (Q012) fenchlorazole-ethyl, (Q013) fenclorim, (Q014) flurazole, (Q015) fluxofenim, (Q016) furilazole, (Q017) isoxadifen-ethyl, (Q018) mefenpyr-diethyl, (Q019) mephenate, (Q020) methoxyphenone, (Q021) naphthalic anhydride, (Q022) oxabetrinil, (Q023) AD-67, (Q024) cyprosulfamide, (Q025) furilazole and the corresponding R isomer, (Q026) isoxadifenethyl, (Q027) N-(aminocarbonyl)-2-methylbenzenesulfonamide, (Q028) N-(aminocarbonyl)-2-fluorobenzenesulfonamide, (Q029) 1-bromo-4-[(chloromethyl)sulfonyl]benzene, (Q030) 2-(dichloromethyl)-2-methyl-1,3-dioxolane (MG 191), (Q031) 4-(dichloroacetyl)-1-oxa-4-azospiro-[4.5]decane (MON 4660), (Q032) 2,2-dichloro-1-(2,2,5-trimethyl-3-oxazolidinyl)-ethanone, (Q033) 2-methoxy-N-[[4-[(methylamino)carbonyl]amino]phenyl]sulfonyl]-benzamide, (Q034) 2-methoxy-N-[[4-[(methylamino)carbonyl]amino]-phenyl]sulfonyl]-benzamide.

In an embodiment, the examples of herbicides may be selected from the following groups:

(A) acetamides: (A001) acetochlor, (A002) alachlor, (A003) butachlor, (A004) dimethachlor, (A005) dimethenamid, (A006) dimethenamid-P, (A007) flufenacet, (A008) mefenacet, (A009) metolachlor, (A010) metazachlor, (A011) napropamide, (A012) naproanilide, (A013) pethoxamid, (A014) pretilachlor, (A015) propachlor, (A016) thenylchlor;

(B) amino acid derivatives: (B001) bilanafos, (B002) glyphosate, (B003) glufosinate, (B004) sulfosate;

(C) aryloxyphenoxypropionates: (C001) clodinafop, (C002) cyhalofop-butyl, (C003) fenoxaprop, (C004) fluazifop, (C005) haloxyfop, (C006) metamifop, (C007) propaquizafop, (C008) quizalofop, (C009) quizalofop-P-tefuryl;

(D) bipyridyls: (D001) diquat, (D002) paraquat;

(E) (thio)carbamates: (E001) asulam, (E002) butylate, (E003) carbetamide, (E004) desmedipham, (E005) dimepiperate, (E006) eptam (EPTC), (E007) esprocarb, (E008) molinate, (E009) orbencarb, (E010) phenmedipham, (E011) prosulfocarb, (E012) pyributicarb, (E013) thiobencarb, (E014) triallate;

(F) cyclohexanediones: (F001) butoxydim, (F002) clethodim, (F003) cycloxydim, (F004) profoxydim, (F005) sethoxydim, (F006) tepraloxym, (F007) tralkoxydim;

(G) dinitroanilines: (G001) benfluralin, (G002) ethalfluralin, (G003) oryzalin, (G004) pendimethalin, (G005) proflumetoxim, (G006) trifluralin;

(H) diphenyl ethers: (H001) acifluorfen, (H002) acifluorfen, (H003) bifenthrin, (H004) diclofop, (H005) ethoxyfen, (H006) fomesafen, (H007) lactofen, (H008) oxyfluorfen;

(I) hydroxybenzonitriles: (I001) bometoxynil, (I002) dichlobenil, (I003) ioxynil;

(J) imidazolinones: (J001) imazamethabenz, (J002) imazamox, (J003) imazapic, (J004) imazapyr, (J005) imazaquin, (J006) imazethapyr;

(K) phenoxy acetic acids: (K001) clomeprop, (K002) 2,4-dichlorophenoxyacetic acid (2,4-D), (K003) 2,4-DB, (K004) dichlorprop, (K005) MCPA, (K006) MCPA-thioethyl, (K007) MCPB, (K008) Mecoprop;

(L) pyrazines: (L001) chloridazon, (L002) flufenpyr-ethyl, (L003) fluthiacet, (L004) norflurazon,
5 (L005) pyridate;

(M) pyridines: (M001) aminopyralid, (M002) clopyralid, (M003) diflufenican, (M004) dithiopyr, (M005) fluridone, (M006) fluroxypyr, (M007) picloram, (M008) picolinafen, (M009) thiazopyr;

(N) sulfonyl ureas: (N001) amidosulfuron, (N002) azimsulfuron, (N003) bensulfuron, (N004) chlorimuron-ethyl, (N005) chlorsulfuron, (N006) cinosulfuron, (N007) cyclosulfamuron, (N008) ethoxysulfuron, (N009) flazasulfuron, (N010) flucetosulfuron, (N011) flupyr-sulfuron, (N012) foramsulfuron, (N013) halosulfuron, (N014) imazosulfuron, (N015) iodosulfuron, (N016) mesosulfuron, (N017) metazosulfuron, (N018) metsulfuron-methyl, (N019) nicosulfuron, (N020) oxasulfuron, (N021) primisulfuron, (N022) prosulfuron, (N023) pyrazosulfuron, (N024) rimsulfuron, (N025) sulfometuron, (N026) sulfosulfuron, (N027) thifensulfuron, (N028) triasulfuron, (N029) tribenuron, (N030) trifloxysulfuron, (N031) triflusulfuron, (N032) tritosulfuron, (N033) 1-((2-chloro-6-propyl-imidazo[1,2-b]pyridazin-3-yl)sulfonyl)-3-(4,6-dimethoxy-pyrimidin-2-yl)urea;
10

(O) triazines: (O001) ametryn, (O002) atrazine, (O003) cyanazine, (O004) dimethametryn, (O005) ethiozin, (O006) hexazinone, (O007) metamitron, (O008) metribuzin, (O009) prometryn, (O010) simazine, (O011) terbuthylazine, (O012) terbutryn, (O013) triaziflam;

(P) ureas: (P001) chlorotoluron, (P002) daimuron, (P003) diuron, (P004) fluometuron, (P005) isoproturon, (P006) linuron, (P007) methabenzthiazuron, (P008) tebuthiuron;
20

(Q) other acetolactate synthase inhibitors: (Q001) bispyribac-sodium, (Q002) cloransulam-methyl, (Q003) diclosulam, (Q004) florasulam, (Q005) flucarbazone, (Q006) flumetsulam, (Q007) metosulam, (Q008) ortho-sulfamuron, (Q009) penoxsulam, (Q010) propoxycarbazine, (Q011) pyribambenz-propyl, (Q012) pyribenzoxim, (Q013) pyriftalid, (Q014) pyriminobac-methyl, (Q015) pyrimisulfan, (Q016) pyri-thiobac, (Q017) pyroxasulfone, (Q018) pyrox-sulam;
25

(R) others: (R001) amicarbazone, (R002) aminotriazole, (R003) anilofos, (R004) beflubutamid, (R005) benazolin, (R006) bencarbazone, (R007) benfluresate, (R008) benzofenap, (R009) bentazone, (R010) benzobicyclon, (R011) bicyclop-yrone, (R012) bromacil, (R013) bromobutide, (R014) butafenacil, (R015) butamifos, (R016) cafenstrole, (R017) carfentrazone, (R018) cinidon-ethyl, (R019) chlorthal, (R020) cinmethylin, (R021) clomazone, (R022) cumyluron, (R023) cyprosulfamide, (R024) dicamba, (R025) difenzoquat, (R026) diflufenzopyr, (R027) Drechslera monoceras, (R028) endothal, (R029) ethofumesate, (R030) etobenzanid, (R031) fenoxasulfone, (R032) fentrazamide, (R033) flumiclorac-pentyl, (R034) flumioxazin, (R035) flupoxam, (R036) flurochloridone, (R037) flurtamone, (R038)
30

indanofan, (R039) isoxaben, (R040) isoxaflutole, (R041) lenacil, (R042) propanil, (R043) propyzamide, (R044) quinclorac, (R045) quinmerac, (R046) mesotrione, (R047) methyl arsonic acid, (R048) naptalam, (R049) oxadiargyl, (R050) oxadiazon, (R051) oxaziclomefone, (R052) pentoxazone, (R053) pinoxaden, (R054) pyraclostrobin, (R055) pyraflufen-ethyl, (R056) pyrasulfotole, (R057) pyrazoxyfen, (R058) pyrazolynate, (R059) quinclamine, (R060) saflufenacil, (R061) sulcotrione, (R062) sulfentrazone, (R063) terbacil, (R064) tefuryltrione, (R065) tembotrione, (R066) thiencarbazone, (R067) topramezone, (R068) (3-[2-chloro-4-fluoro-5-(3-methyl-2,6-dioxo-4-trifluoromethyl-3,6-dihydro-2H-pyrimidin-1-yl)-phenoxy]-pyridin-2-yl)-acetic acid ethyl ester, (R069) 6-amino-5-chloro-2-cyclopropyl-pyrimidine-4-carboxylic acid methyl ester, (R070) 6-chloro-3-(2-cyclopropyl-6-methylphenoxy)-pyridazin-4-ol, (R071) 4-amino-3-chloro-6-(4-chloro-phenyl)-5-fluoro-pyridine-2-carboxylic acid, (R072) 4-amino-3-chloro-6-(4-chloro-2-fluoro-3-methoxy-phenyl)-pyridine-2-carboxylic acid methyl ester, and (R073) 4-amino-3-chloro-6-(4-chloro-3-dimethylamino-2-fluoro-phenyl)-pyridine-2-carboxylic acid methyl ester.

In an embodiment, the examples of plant growth regulators may be selected from the following groups:

(I-A001) abscisic acid, (I-A002) amidochlor, (I-A003) ancymidol, (I-A004) 6-benzylaminopurine, (I-A005) brassinolide, (I-A006) butralin, (I-A007) chlormequat (chlormequat chloride), (I-A008) choline chloride, (I-A009) cyclanilide, (I-A010) daminozide, (I-A011) dikegulac, (I-A012) dimethipin, (I-A013) 2,6-dimethylpuridine, (I-A014) ethephon, (I-A015) flumetralin, (I-A016) flurprimidol, (I-A017) fluthiacet, (I-A018) forchlorfenuron, (I-A019) gibberellic acid, (I-A020) inabenfide, (I-A021) indole-3-acetic acid, (I-A022) maleic hydrazide, (I-A023) mefluidide, (I-A024) mepiquat (mepiquat chloride), (I-A025) naphthaleneacetic acid, (I-A026) N-6-benzyladenine, (I-A027) paclobutrazol, (I-A028) prohexadione (prohexadione-calcium), (I-A029) prohydrojasmon, (I-A030) thidiazuron, (I-A031) triapenthenol, (I-A032) tributyl phosphorotrithioate, (I-A033) 2,3,5-tri-iodobenzoic acid, (I-A034) trinexapac-ethyl, and (I-A035) uniconazole.

In another embodiment, the at least one active ingredient (A) selected from insecticides.

In another embodiment, the at least one active ingredient (A) selected from fungicides.

In another embodiment, the at least one active ingredient (A) selected from herbicides.

In an embodiment, the particle size of the active ingredient is less than 1 μm , preferably less than 0.5 μm and more preferably less than 0.1 μm .

In one embodiment, the granular composition according to the present invention may comprise one or more further agriculturally acceptable additives or non-active excipients, for example, customary extenders and also solvent(s), diluent(s), dye(s), wetting agent(s), dispersant(s), emulsifier(s), antifoam(s), preservative(s), filler(s), thickener(s), adhesive(s), gibberellins, solid carrier(s), liquid carrier(s), gaseous carrier(s), surfactant(s), binder(s), disintegrating agent(s), pH adjuster(s), anti-caking

agent(s), penetrant(s), anti-freezing agent(s), lipids, organic or in-organic salt(s), defoaming agent(s), extender(s), stabilizer(s) and/or coloring agent(s) or a combination thereof and also water.

In an embodiment, the present invention involves a granular composition that may comprise of a binder. The binder component is included in the granules as necessary to reduce powder formation during storage and handling and/or to reduce loss of the active which is concentrated toward the outer surface of the granules.

Suitable binder is selected from carbohydrate, protein, lipid, synthetic polymer, glycolipid, glycoprotein, lipoprotein, lignin, a lignin derivative, a carbohydrate-based composition, or a combination thereof. Specific carbohydrate binders is selected from glucose, mannose, fructose, galactose, sucrose, lactose, maltose, xylose, arabinose, trehalose or a combination thereof such as corn syrup; celluloses such as carboxymethylcellulose, ethylcellulose, hydroxyethylcellulose, hydroxymethylcellulose, hydroxyethylpropylcellulose, methylhydroxyethyl-cellulose, methylcellulose; starches such as amylose, seagel, starch acetates, starch hydroxyethyl ethers, ionic starches, long-chain alkyl starches, dextrans, amine starches, phosphates starches, and di-aldehyde starches; plant starches such as corn starch and potato starch; other carbohydrates such as pectin, amylopectin, xylan, glycogen, agar, alginic acid, phycocolloids, chitin, gum arabic, guar gum, gum karaya, gum tragacanth and locust bean gum; vegetable oils such as corn, soybean, peanut, canola, olive and cotton seed; complex organic substances such as lignin and nitrolignin; derivatives of lignin such as ligno sulfonate salts illustratively including calcium ligno sulfonate and sodium ligno sulfonate and complex carbohydrate-based compositions containing organic and inorganic ingredients such as molasses. Suitable protein binders illustratively include soy extract, zein, protamine, collagen, and casein. Binders also include synthetic organic polymers capable of promoting or producing cohesion of particle components and such binders is selected from ethylene oxide polymers, polyacrylamides, polyacrylates, polyvinyl pyrrolidone, polyethylene glycol, polyvinyl alcohol, polyvinylmethyl ether, polyvinyl acrylates, polylactic acid, and latex. In a preferred embodiment, the binder is calcium lignosulfonate, molasses, a liquid corn starch, a liquid corn syrup or a combination thereof.

Suitable surfactant for example, a dispersing agent, a wetting agent, a spreader, an adjuvant for penetration enhancement, rain fastness, soil leaching control etc., are nonionic or anionic surfactants or a combination of these surfactants.

In one embodiment, the present invention provides a dust-free granular composition comprising a granular nucleus having a first coating layer that is applied on the surface of the core material which is a water in-soluble material, and a second coating layer applied over the surface of the first coating layer. The first coating layer comprises a water soluble polymer and the second coating layer comprising a polymeric composition applied on the surface of the first coating layer and optionally another outer coating layer.

In one embodiment, the present invention provides a method for preparing the coated granular composition that comprises:

- a) thoroughly cleaned water in-soluble material as a granular nucleus (or granular core);
- b) preparing a solution of an active ingredient (A) and other agriculturally acceptable additives;
- 5 c) dissolving a water soluble polymer in water which was then mixed with the solution of step b);
- d) the resulting solution of step c) was sprayed onto the granular nucleus followed by drying;
- e) a second coating layer of 3-5% aqueous solution of the polymeric composition was applied onto the first polymer coating layer. The resulting granules were dried to form the dust-free granules.

- 10 The skilled person will appreciate that in preparing the granular composition, the spray solution may be applied at a controlled rate based on spray solution assay, for example with the granular support (e.g. a clay, such as a montmorillonite type-clay) being added simultaneously in measured aliquots into the mixer in a continuous process.

The equipment used to prepare the granular composition is typical and standard in the art, e.g. the
15 process may involve the use of a continuous v-blender which loads the granular support (e.g. clay, such as a montmorillonite type-clay) and performs the spray operation and blending simultaneously. Following which the granular material may then be transferred to an orbital shaker equipped with an appropriately sized mesh screen and dust collection system to remove any fine or oversized material prior to packing and/or storing the granules.

- 20 In one embodiment, the present invention provides a granular agrochemical composition comprising:

- a) at least one active ingredient (A);
- b) a granular nucleus;
- c) a first coating layer of water-soluble polymer selected from polyvinyl alcohol, carboxymethyl cellulose or a combination thereof applied onto the granular nucleus; and
- 25 d) at least one second coating layer of polymeric composition which comprises polyethylene glycol, polysiloxanes, polyacrylates, or a combination thereof applied onto the surface of the first coating layer,

wherein the second coating layer provides in controlling dusting due to abrasion that rips off the first coating layer containing the active ingredient.

- 30 In another embodiment, the present invention provides a granular agrochemical composition comprising:

- e) at least one active ingredient (A);
- f) a granular nucleus;

- g) a first coating layer of a water soluble polymer selected from polyvinyl alcohol, carboxymethyl cellulose, hydroxylpropyl methylcellulose, hydroxylpropyl cellulose or a combination thereof comprising said active ingredient (A) which is applied on the granular nucleus; and
- h) at least one second coating layer of polymeric composition selected from polyethylene glycol, polysiloxanes, polyacrylates, or a combination thereof applied on the first coating layer,
- wherein the second coating layer provides in controlling dusting due to abrasion that rips off the first coating layer comprising the active ingredient (A).

In another embodiment, the present invention provides a granular agrochemical composition comprising:

- a) at least one active ingredient (A);
- b) a granular nucleus selected from quartzite, quartz, silicon dioxide or silica, and dolomite;
- c) a first coating layer of the water soluble polymer selected from polyvinyl alcohol, carboxymethyl cellulose or a combination thereof comprising said active ingredient (A) which is applied on the granular nucleus; and
- d) at least one second coating layer of the polymeric composition selected from polyethylene glycol, polysiloxanes, polyacrylates or a combination thereof applied on the first coating layer.

In another embodiment, the present invention provides a granular agrochemical composition comprising:

- a) at least one active ingredient (A) selected from water soluble active ingredient;
- b) a granular nucleus selected from quartzite, quartz, silicon dioxide or silica, and dolomite;
- c) a first coating layer of the water soluble polymer selected from polyvinyl alcohol, carboxymethyl cellulose or a combination thereof comprising said active ingredient (A) which applied on the surface of granular nucleus; and
- d) at least one second coating layer of the polymeric composition selected from polyethylene glycol, polysiloxanes, polyacrylates or a combination thereof applied on the first coating layer.

In another embodiment, the present invention provides a granular agrochemical composition comprising:

- a) at least one active ingredient (A) selected from water in-soluble active ingredient;
- b) a granular nucleus selected from quartzite, quartz, silicon dioxide or silica, and dolomite;
- c) a first coating layer of the water soluble polymer selected from polyvinyl alcohol, carboxymethyl cellulose or a combination thereof comprising said active ingredient (A) which applied on the surface of granular nucleus; and
- d) at least one second coating layer of the polymeric composition selected from polyethylene glycol, polysiloxanes, polyacrylates or a combination thereof applied on the first coating layer.

In another embodiment, the present invention provides a granular agrochemical composition comprising:

- a) at least one active ingredient (A) selected from insecticides, acaricides, fungicides, herbicides, nematocides, molluscides, stimulants, plant growth regulators and/or repellents, fertilizers, biocides, pheromones, or bactericides;
- b) a granular nucleus selected from quartzite, quartz, silicon dioxide or silica, and dolomite;
- c) a first coating layer of the water soluble polymer selected from polyvinyl alcohol, carboxymethyl cellulose or a combination thereof comprising said active ingredient (A) which applied on the surface of granular nucleus; and
- d) at least one second coating layer of the polymeric composition selected from polyethylene glycol, polysiloxanes, polyacrylates or a combination thereof applied on the first coating layer.

In yet another embodiment, the at least one active ingredient (A) selected from insecticides.

In yet another embodiment, the at least one active ingredient (A) selected from fungicides.

In yet another embodiment, the at least one active ingredient (A) selected from herbicides.

In an exemplary embodiment, the present invention provides a granular agrochemical composition comprising:

- a) at least one active ingredient (A);
- b) dolomite as a granular nucleus;
- c) a first coating layer of a water soluble polymer selected from polyvinyl alcohol, carboxymethyl cellulose, or a combination thereof comprising said active ingredient (A) applied on the granular nucleus; and
- d) at least one second coating layer of polyethylene glycol applied on the surface of the first coating layer.

In an exemplary embodiment, the present invention provides a granular agrochemical composition comprising:

- a) at least one active ingredient (A);
- b) quartz as a granular nucleus;
- c) a first coating layer of a water soluble polymer selected from polyvinyl alcohol, carboxymethyl cellulose or a combination thereof comprising said active ingredient (A) applied on the granular nucleus; and
- d) at least one second coating layer of polyethylene glycol applied on the surface of the first coating layer.

In an exemplary embodiment, the present invention provides a granular agrochemical composition comprising:

- a) at least one active ingredient (A);
- b) quartzite as a granular nucleus;
- c) a first coating layer of water soluble polymer selected from polyvinyl alcohol, carboxymethyl cellulose or a combination thereof comprising said active ingredient (A) applied on the granular nucleus; and
- d) at least one second coating layer of polyethylene glycol applied on the surface of the first coating layer.

In an exemplary embodiment, the present invention provides a granular agrochemical composition comprising:

- a) at least one active ingredient (A);
- b) silica as a granular nucleus;
- c) a first coating layer of water soluble polymer selected from polyvinyl alcohol, carboxymethyl cellulose or a combination thereof comprising said active ingredient (A) applied on the granular nucleus; and
- d) at least one second coating layer of polyethylene glycol applied on the surface of the first coating layer.

Advantages of the present invention:

1. The granular composition having a dust-free or zero dust.
2. The granular composition that is preventing inhalation hazards or skin and/or eye irritation for the user during application.
3. The granular composition that is providing a more stable shelf life.
4. The granular composition that is providing higher adhesiveness, lubrication and pinhole free surface.
5. Broadcast hazard is zero.

The present invention encompasses a dust-free granular agrochemical composition and processes for the preparation thereof and addresses the problems encountered with regard to functionality of prior compositions in terms of dust formation during transportation.

The compositions and processes of the present invention are further illustrated by the examples below. The examples serve only to illustrate the invention and should not be interpreted as limiting since further modifications of the disclosed invention will be apparent to those skilled in the art. All such modifications are deemed to be within the scope of the invention.

Example 1: A dust-free granular composition of Thiocyclam hydrogen oxalate:

SN.	Component	Qty. % w/w
1	Thiocyclam hydrogen oxalate (87% w/w)	4.775

2	Iron oxide	0.1
3	Micron talc 4010 white	0.5
4	Phosphoric acid	0.12
5	PVA	0.02
6	Dye-1 from Clariant	0.05
7	Dye-2 from Clariant	0.001
8	Sand	94
9	PEG -10000	0.3
10	Residual moisture	0.129
	Total	100.00

A dust-free granular composition of the present invention was prepared by the following steps:

- a) The water in-soluble material such as quartzite as a granular nucleus (or granular core) obtained was thoroughly cleaned using water.
- 5 b) A solution of thiocyclam hydrogen oxalate (87% w/w) as an active ingredient and other agriculturally acceptable additives, was prepared by initially mixing thiocyclam hydrogen oxalate, iron oxide, micron talc 4010 white, phosphoric acid, Dye-1 from Clariant, and Dye-2 from Clariant in 50 mL of water.
- c) A water soluble polymer such as polyvinyl alcohol was dissolved in water and mixed with the
10 solution of step b).
- d) The resulting solution of step c) was sprayed onto the granular nucleus.
- e) Subsequently, post drying of first coating layer in step d), a second coating layer of 3-5% aqueous solution of high molecular weight polymer containing polyethylene glycol was applied onto the first polymer coating layer. The resulting granules were dried to form the dust-free
15 granules.

Example 1 was subjected to several tests and compared with a comparable commercial product, VIBRANT (4% GR available from PI Industries Ltd. – Comparative Example 1).

A) **Simulated Transportation Test:**

This simulated transportation test was carried out using Linux® Vibration Tester (Micro Digital Model).

- 20 **Procedure:** 50 Kg of packed material (Example 1 and Comparative Example 1) was loaded on the moveable plate of the machine. The frequency of oscillation of the horizontal plane was maintained at 20 Hz and the machine was operated for five hours. Under these conditions, the movement of the packaged material mimics the jerks experienced during transportation over five thousand kilometers. Post rocking the machine for five hours, the materials was taken out from their packaging and post
25 sieving using a 200 BSS mesh (75 microns) the amount of dust is ascertained as a percentage of the material used.

Condition: Temperature 27+/-1 °C and Relative Humidity - 65+/-2%.

Table 1: Comparative total dust levels using the simulated transportation test

Total dust (in weight percentage of the product)	
Comparative Example 1	Example 1
0.07-0.1 %	0.0003-0005 % w/w

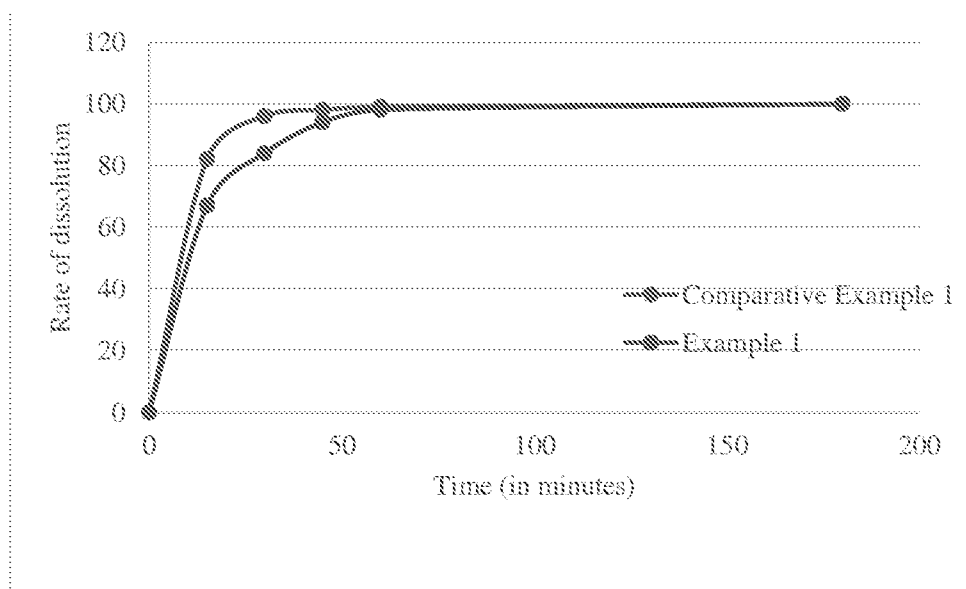
The above test results indicate that the Example 1 produce less dust or zero-dust, which is < 0.0005 % w/w of the product. This demonstrates the benefits derived from employing a coating layer resulting the product is stable and reliably made and packed.

B) Rate of Dissolution

The composition of Example 1 and comparative Example 1 was subjected to the dissolution testing wherein the release of the active ingredient from the coated granular composition was evaluated in distilled water.

Process: 10 g of the granules were taken in a beaker containing 100g of distilled water. Keeping the temperature constant at 27 °C, the granules were slowly stirred at a speed of 10 rpm. Aliquots of the aqueous solution was withdrawn at different intervals 15, 30, 45, 60, and 180 minutes. These aqueous solutions were then analyzed in an HPLC and the data compared with a standard solution of thiacyclam hydrogen oxalate. The percentage of thiacyclam hydrogen oxalate present in the solution withdrawn are evaluated. The rate of release of thiacyclam hydrogen oxalate from the comparative Example 1 and Example 1 granules are plotted as a function of time as shown in the graph.

The results of this testing is illustrated in Figure 1.



As can be seen from the graphic display in Figure 1, the granular composition of Example 1 having the active ingredient – thiacyclam hydrogen oxalate incorporated into the coating granules provided an

effective and efficient system for release of the active ingredient over a period of greater than 1 hour. In fact, as demonstrated by the results shown in Figure 1, the composition of the present invention provided a rate of release of about 80% (by weight) of the active ingredient over a period of 30 minutes from the time of initial exposure to moisture while about 95% (by weight) of the active ingredient of comparative Example 1 was released over the same time period. This result demonstrates the benefits derived from employing a coating layer resulting in a slower releasing product which is desirable when a highly soluble active ingredient is incorporated therein. Also, implies higher residence time at the roots and better efficacy of adsorption and product effectiveness.

C) Irritation Index/Allergic Test:

- 10 The granules formed in accordance with the present invention were delivered without dust exposure to the field workers which was evident from the irritation index/ allergic test results.

D) Broadcast Hazard:

The granules formed in accordance with the present invention were delivered without any broadcast hazard.

- 15 Thus, from the foregoing description, it will be apparent to a person skilled in the art that many changes and modifications can be made thereto without departing from the spirit or scope of the invention as set forth in the description. Accordingly, it is not intended that the scope of the foregoing description be limited to the description set forth above, but rather that such description be construed as encompassing such features that reside in the present invention, including all the features and embodiments that would
20 be treated as equivalents.

Claims:

1. A dust-free granular composition comprising:
 - a) at least one active ingredient (A);
 - b) a granular nucleus;
 - 5 c) a first coating layer of a water soluble polymer that comprises said active ingredient (A) which applied on the granular nucleus; and
 - d) at least one second coating layer of a polymeric composition is applied on the first coating layer.
2. The dust-free granular composition as claimed in claim 1, wherein said granular nucleus is a water insoluble material.
- 10 3. The dust-free granular composition as claimed in claim 1 or 2, wherein said granular nucleus that comprises quartzite, quartz, silicon dioxide or silica, micro-crystalline quartz, pyrites, talcs, montmorillonites, bauxites, kaolinites, bentonite, lithium magnesium sodium silicate, calcium sulfate, calcium phosphate, white clay, hectorite, dolomite, attapulgite, Fuller's earth, fossilized plant materials, perlites or a combination thereof
- 15 4. The dust-free granular composition as claimed in claim 3, wherein said granular nucleus comprises dolomite, quartzite, quartz, silicon dioxide or silica, sand or a combination thereof.
5. The dust-free granular composition as claimed in claim 1, wherein the diameter of the granular nucleus is in the range of 1 to 200 μm , preferably in the range of 1 to 100 μm , and more preferably in the range of 1 to 50 μm .
- 20 6. The dust-free granular composition as claimed in claim 1, wherein said first coating layer that comprises a water soluble polymer is selected from polyvinyl alcohol, polyvinylpyrrolidone, polyacrylamide, polyacrylic acid, sodium polyacrylate, carboxymethyl starch, dialdehyde starch, alginate, polystyrene sulfonate, hydroxypropyl cellulose, methylcellulose, carboxymethylcellulose, hydroxyethyl cellulose, hydroxylpropyl methylcellulose, or a combination thereof.
- 25 7. The dust-free granular composition as claimed in claim 6, wherein said first coating layer comprises polyvinyl alcohol, carboxymethylcellulose, hydroxylpropyl methylcellulose, hydroxylpropyl cellulose or a combination thereof.
8. The dust-free granular composition as claimed in claim 1 or 6, wherein the content of the water soluble polymer is 0.01 parts by weight to 50 parts by weight for 100 parts by weight of the granular nucleus; preferably 0.05 parts by weight to 10 parts by weight for 100 parts by weight of the granular nucleus.
- 30 9. The dust-free granular composition as claimed in claim 1 or 6, wherein the molecular weight of water soluble polymer is in the range of 100 to 100 kDa, preferably in the range of 100 to 5000 Da, and more preferably in the range of 100 to 1000 Da.

10. The dust-free granular composition as claimed in claim 1 or 6, wherein the thickness of the first coating layer of the water soluble polymer is in the range of 0.01 to 20 μm , preferably in the range of 0.1 to 10 μm , and more preferably in the range of 0.1 to 5 μm .
11. The dust-free granular composition as claimed in claim 1, wherein said second coating layer that
5 comprises a polymeric composition is selected from polyethylene glycols, polysiloxanes, polyacrylates, polymethacrylic polymers, polyacrylonitrile, acrylonitrile butadiene styrene polymer, celluloid, cellulose acetate, ethylene-vinyl acetate, ethylene vinyl alcohol, polybutylene terephthalate, polycaprolactone, polychlorotrifluoroethylene, polyethylene terephthalate, polycyclohexylene dimethylene terephthalate, polycarbonate or a combination thereof.
- 10 12. The dust-free granular composition as claimed in claim 11, wherein said second coating layer comprises polyethylene glycol, polysiloxanes, polyacrylates or a combination thereof.
13. The dust-free granular composition as claimed in claim 1 or 11, wherein the content of the second coating layer of polymer composition is 0.01 parts by weight to 50 parts by weight for 100 parts by weight of the granular nucleus; preferably 0.05 parts by weight to 10 parts by weight for 100 parts
15 by weight of the granular nucleus.
14. The dust-free granular composition as claimed in claim 1 or 11, wherein the molecular weight of the second coating layer of the polymeric composition is in the range of 10 kDa to 100 kDa, and preferably in the range of 10 kDa to 30 kDa.
15. The dust-free granular composition as claimed in claim 1 or 11, wherein the thickness of the second
20 coating layer of the polymeric composition is in the range of 0.01 to 20 μm , preferably in the range of 0.1 to 10 μm , and more preferably in the range of 0.1 to 5 μm .
16. The dust-free granular composition as claimed in claim 1, wherein said active ingredient(s) is selected from a water soluble or water insoluble active ingredient(s).
17. The dust-free granular composition as claimed in claim 1 or 16, wherein said active ingredient(s) is
25 selected from insecticides, fungicides, herbicides, acaricides, nematocides, molluscides, stimulants, plant growth regulators, pheromones, bactericides or a combination thereof.
18. The dust-free granular composition as claimed in claim 1, wherein said first coating layer further comprises an agriculturally acceptable additives or non-active excipients.
19. The dust-free granular composition as claimed in claim 18, wherein said agriculturally acceptable
30 additives or non-active excipients comprises water, solvent(s), diluent(s), dye(s), wetting agent(s), dispersant(s), emulsifier(s), antifoam(s), preservative(s), filler(s), thickener(s), adhesive(s), gibberellins, solid carrier(s), liquid carrier(s), gaseous carrier(s), surfactant(s), binder(s), disintegrating agent(s), pH adjuster(s), anti-caking agent(s), penetrant(s), anti-freezing agent(s), lipids, organic or in-organic salt(s), defoaming agent(s), extender(s), stabilizer(s) and/or coloring
35 agent(s) or a combination thereof.
20. The dust-free granular composition as claimed in claim 1, wherein said granular agrochemical composition comprises:

- a) at least one active ingredient (A);
- b) a granular nucleus selected from quartzite, quartz, silicon dioxide or silica, and dolomite;
- c) a first coating layer of the water soluble polymer selected from polyvinyl alcohol, carboxymethyl cellulose or a combination thereof comprising said active ingredient (A) which is applied on the granular nucleus; and
- d) at least one second coating layer of the polymeric composition selected from polyethylene glycol, polysiloxanes, polyacrylates or a combination thereof applied on the first coating layer.

21. A method for producing a dust-free granular composition as claimed in 1, comprising the steps of:

- a) thoroughly cleaned water in-soluble material as a granular nucleus;
- b) preparing a solution of an active ingredient (A) and other agriculturally acceptable additives;
- c) dissolving a water soluble polymer in water which was then mixed with the solution of step b);
- d) the resulting solution of step c) was sprayed onto the granular nucleus followed by drying;
- e) a second coating layer of 3-5% aqueous solution of the polymeric composition was applied onto the first polymer coating layer. The resulting granules were dried to form the dust-free granules.

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2023/051437

A. CLASSIFICATION OF SUBJECT MATTER

INV. **A01N43/12 A01N25/28 A01P7/04**
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 A01P

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

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, CHEM ABS Data, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 02/05641 A1 (SYNGENTA PARTICIPATIONS AG [CH]; KITAGAKI KENICHI [JP]) 24 January 2002 (2002-01-24) abstract page 1, line 1 - page 5, line 17 page 6, lines 12-18 page 13 - page 17; claims 1-4, 11; examples 1-5	1-21
Y	EP 0 848 906 A1 (CHISSO CORP [JP]) 24 June 1998 (1998-06-24) abstract page 3, lines 1-5 page 4, lines 3-12 claims 1-3	1-21
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☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

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Date of the actual completion of the international search

16 June 2023

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23/06/2023

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INTERNATIONAL SEARCH REPORT

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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Y	abstract page 1, lines 5-16 page 3, line 12 - page 6, line 6 page 39, line 16 - page 43, line 1 page 60, line 9 - page 63, line 4; examples A-D page 64, lines 5-15; example 5; table 2 -----	1-21
Y	CA 1 122 897 A (BAYER AG) 4 May 1982 (1982-05-04) abstract page 1, lines 1-3 page 1, line 28 - page 2, line 3 page 2, line 22 - page 6, line 11 page 12 - page 13; example 7 -----	1-21

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International application No

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