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(54) Title: COMPOSITION COMPRISING CYPRODINIL AND LACTOSE-BASED FILLER

(57) Abstract: A composition comprising cyprodinil and a lactose-based filler.

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COMPOSITION COMPRISING CYPRODINIL AND LACTOSE-BASED FILLER

The present invention relates to compositions comprising a lactose-based filler, together with method of preparing and using the same.

The sustainability of agrochemical formulations has become an important target in the agrochemical field. The target is to develop products with low environmental impact and, as part of this, the presence of and biodegradability of microplastics has become an important topic. The use of granules comprising organic monomers (such as polyurea) and/or cross-linkers is thus undesirable due to their poor biodegradability and classification as microplastics.

Water dispersible granules (WGs) are a solid, non-dusty granular formulation which disperse or dissolve quickly when added to water in the spray tank to give a fine particle suspension. They provide a system for delivering solid active ingredients to a target organism. They allow for the production of highly-concentrated formulations which are wettable and easily disintegrated on contact with water. WGs are an attractive alternative to wettable powder (WP) formulations due to their reduction in dust production, the possibility of high loading of active ingredients and the absence of crystal growth or sedimentation. Package disposal of WG compositions is also easier to deal with than for liquid formulations.

Cyprodinil is an anilinopyrimidine fungicide that is highly effective against a broad range of fungi and to date has been commercialised as a WG formulation comprising a urea polymer with formaldehyde as a carrier or filler. The terms 'carrier' and 'filler' can be used interchangeably herein. There is therefore a pressing technical need for a composition that achieves comparable technical performance and efficacy but which removes microplastics from the product.

Such a product is required to satisfy a significant number of technical and physical properties. The composition must exhibit satisfactory extrusion properties, a lack of residue both during processing and upon the ultimate plant application, effective dispersibility upon mixing with water and good suspension stability in the medium term.

The present invention addresses the above technical problems and there is therefore provided a composition comprising cyprodinil and a lactose-based filler.

By 'lactose-based filler' we include both pure and treated forms of lactose, all crystal and amorphous forms of lactose, as well as both the anhydrous and hydrated forms. Preferably the lactose-based filler is lactose monohydrate. Preferably the lactose-based filler is present in an amount of from 20 to 50% by weight. Without wishing to be bound by theory, it is thought that the water-solubility properties of such filler reduces the burden on any dispersant and thus leads to advantageous suspension properties.

Advantageously the composition comprises no or substantially no microplastics. By 'substantially no' we mean that the composition contains less than 0.01% by weight of the specified material.

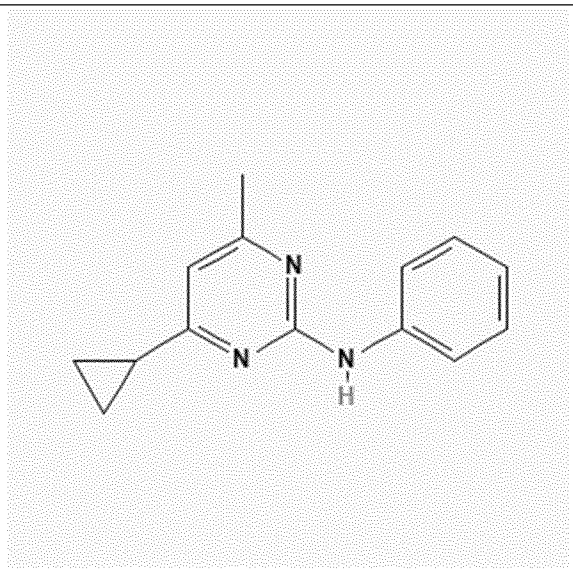
By 'microplastics' we mean synthetic, water-insoluble, non-biodegradable, polymeric materials having a size across its largest dimension of equal to or less than 5 mm.

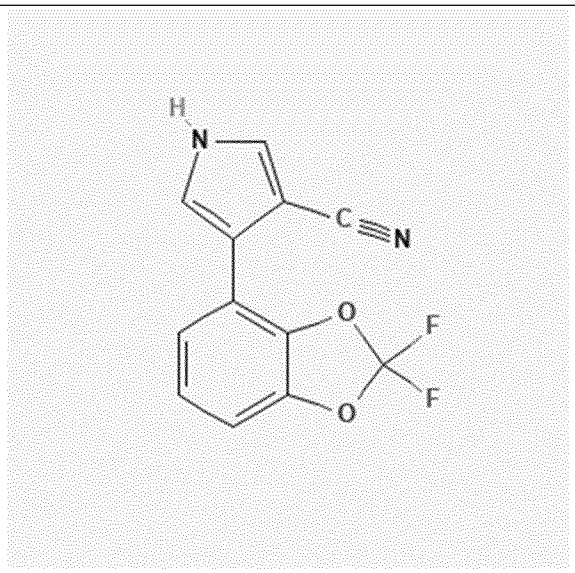
In an embodiment, cyprodinil is the sole active ingredient.

In an alternative embodiment, the composition further comprises fludioxinil. Fludioxonil is a fungicide of the phenylpyrrole group of substances. It is a broad-spectrum fungicide which is non-systemic with a long residual activity and can advantageously be used in combination with cyprodinil.

The structures of these components are shown in Table A.

Table A

Compound	*Structure*
Cyprodinil	

Fludioxonil	

The compositions may be in the form of a wettable powder (WP) or a WG (water dispersible granule), preferably water-dispersible granules (WG).

Advantageously, the cyprodinil is present in an amount of from 30 to 60% by weight.

In the embodiment where cyprodinil is the sole active ingredient the cyprodinil is preferably present in an amount of from 40 to 60% by weight, such as from 41 to 59% by weight, from 44 to 57% by weight, from 46 to 54% by weight, or even from 48 to 52% by weight.

In the embodiment where cyprodinil is the sole active ingredient the lactose-based filler is preferably present in an amount of from 31 to 49% by weight, such as from 33 to 48% by weight, from 34 to 47% by weight, from 35 to 46% by weight, from 36 to 45% by weight, or even from 39 to 43% by weight.

Alternatively, in the embodiment where fludioxinil is present, it is advantageously present in an amount of from 20 to 30% by weight, such as 21 to 29% by weight, from 22 to 28% by weight, from 23 to 27% by weight, or even from 24 to 26% by weight. In combination with fludioxinil, cyprodinil is preferably present in an amount of from 30 to 50% by weight, such as from 31 to 48% by weight, from 32 to 45% by weight, from 33 to 42% by weight, from 34 to 40% by weight, or even from 35 to 39% by weight.

In this embodiment the lactose-based filler is preferably present in an amount of from 20 to 40% by weight, such as from 21 to 38% by weight, from 22 to 36% by weight, from 23 to 34% by weight, from 24 to 33% by weight, or even 26 to 31% by weight.

A dispersant or a dispersing agent is typically a surfactant substance, which when added to a suspension of solid particles in a liquid better enables the separation of the particles to avoid their settling or clumping together.

Advantageously the composition comprises one or more dispersants, preferably in an amount of from 0.001 to 10% by weight, or even from 2 to 8% by weight. It is a surprisingly feature of the present invention that a satisfactory technical performance is achieved for the composition despite a low quantity of dispersant.

The one or more dispersants are preferably selected from naphthalenesulfonic acid condensate (e.g., formaldehyde condensate) and/or a lignosulphonate.

The composition may contain an anti-foaming agent. An anti-foaming agent is a chemical additive that reduces and hinders the formation of foam in a composition, such as a pesticidal formulation. Anti-foaming agents which may be used in accordance with the present invention include, but are not limited to, silicones and polydimethylsiloxanes (e.g., Rhodorsil; XIAMETERTM ACP-1500; Antifoam MSA; Xiameter ACP-0001; Xiameter ACP-0100). The antifoam is preferably present in an amount of from 0.1 to 5% by weight, such as from 1 to 3% by weight.

Preferably the composition contains no, or substantially no, sodium sulphate, silicium oxide, calcium carbonate, starch, silica and/or polyurea-based polymers.

Advantageously, the composition demonstrates less than 0.2% residue when tested by the Wet Sieve method defined below.

In a second aspect of the invention there is provided a method of preparing a composition as described herein, preferably comprising an extrusion step.

Advantageously, if the composition is in the form of a WG, the method of preparation comprises:

1. Charging of all solid ingredients;
2. Milling of the mixture with a dry mill;
3. Re-homogenization of the milled feedstock;
4. Wetting of the feedstock to produce an extrudable paste;

5. Extrusion through a basket extruder;
6. Drying of the wet extruded granules in a fluid bed dryer; and
7. Sieving the dry extruded granules.

The composition according to the invention is effective against harmful microorganisms, such as microorganisms, that cause phytopathogenic diseases, in particular against phytopathogenic fungi and bacteria

Thus, in a third aspect of the invention there is provided a method of controlling or preventing phytopathogenic diseases, especially phytopathogenic fungi, on useful plants or on propagation material thereof, which comprises applying to the useful plants, the locus thereof or propagation material thereof a composition as defined.

The term “fungicide” as used herein means a compound that controls, modifies, or prevents the growth of fungi. The term “fungicidally effective amount” means the quantity of such a compound or combination of such compounds that is capable of producing an effect on the growth of fungi. Controlling or modifying effects include all deviation from natural development, such as killing, retardation and the like, and prevention includes barrier or other defensive formation in or on a plant to prevent fungal infection.

The term “plants” refers to all physical parts of a plant, including seeds, seedlings, saplings, roots, tubers, stems, stalks, foliage, and fruits.

The term "plant propagation material” denotes all generative parts of a plant, for example seeds or vegetative parts of plants such as cuttings and tubers. It includes seeds in the strict sense, as well as roots, fruits, tubers, bulbs, rhizomes, and parts of plants.

The term “locus” as used herein means fields in or on which plants are growing, or where seeds of cultivated plants are sown, or where seed will be placed into the soil. It includes soil, seeds, and seedlings, as well as established vegetation.

Preferably the fungi are selected from one or more of *Botrytis, Monilinia, Nectria, Penicillium, Colletotrichum, Fusarium, Gloeosporium, Alternaria, Venturia, Sclerotinia, Stemphylium, Mycosphaerella,* and *Ascochyta*.

Even more preferably, when cyprodinil is the sole active ingredient the fungi are selected from *Venturia* and/or *Monilinia*. Alternatively, where cyprodinil and fludioxonil are used in combination the fungi are selected from *Botrytis*, *Sclerotinia, Monilinia, Stemphylium* and/or *Penicillium*.

Preferably, the composition as described herein is used on one or more of fresh beans (green, runner, broad), dried beans (dwarf French bean, navy bean (Phaseolus), kidney beans, haricot beans, dried broad beans), vining pea and edible podded pea, dried peas (combining peas including marrowfat), carrots, celeriac, protected and outdoor strawberry, protected and outdoor raspberry and blackberry, outdoor crops of blueberry, bilberry, cranberry, redcurrant, blackcurrant, whitecurrant, gooseberry, and/or top fruit (apple, pear, quince, crab apple).

The compositions described herein may, in certain circumstances, may be combined with a compound selected from the group of substances consisting of petroleum oils, 1,1-bis(4-chloro-phenyl)-2-ethoxyethanol, 2,4-dichlorophenyl benzenesulfonate, 2-fluoro-N-methyl-N-1-naphthylacetamide, 4-chlorophenyl phenyl sulfone, acetoprole, aldoxycarb, amidithion, amidothioate, amiton, amiton hydrogen oxalate, amitraz, aramite, arsenous oxide, azobenzene, azothoate, benomyl, benoxa-fos, benzyl benzoate, bixafen, brofenvalerate, bromo-cyclen, bromophos, bromopropylate, buprofezin, butocarboxim, butoxycarboxim, butylpyridaben, calcium polysulfide, camphechlor, carbanolate, carbophenothion, cymiazole, chino-methionat, chlorbenside, chlordimeform, chlordimeform hydrochloride, chlorfenethol, chlorfenson, chlorfensulfide, chlorobenzilate, chloromebuform, chloromethiuron, chloropropylate, chlorthiophos, cinerin I, cinerin II, cinerins, closantel, coumaphos, crotamiton, crotoxyphos, cufraneb, cyanthoate, DCPM, DDT, demephion, demephion-O, demephion-S, demeton-methyl, demeton-O, demeton-O-methyl, demeton-S, demeton-S-methyl, demeton-S-methylsulfon, dichlofluanid, dichlorvos, dicliphos, dienochlor, dimefox, dinex, dinex-diclexine, dinocap-4, dinocap-6, dinocton, dino-penton, dinosulfon, dinoterbon, dioxathion, diphenyl sulfone, disulfiram, DNOC, dofenapyn, doramectin, endothion, eprinomectin, ethoate-methyl, etrimfos, fenazaflor, fenbutatin oxide, fenothiocarb, fenpyrad, fen-pyroximate, fenpyrazamine, fenson, fentrifanil, flubenzimine, flucycloxuron, fluenetil, fluorbenside, FMC 1137, formetanate, formetanate hydrochloride, formparanate, gamma-HCH, glyodin, halfenprox, hexadecyl cyclopropanecarboxylate, isocarbophos, jasmolin I, jasmolin II, jodfenphos, lindane, malonoben, mecarbam, mephosfolan, mesulfen, methacrifos, methyl bromide, metolcarb, mexacarbate, milbemycin oxime, mipafox, monocrotophos, morphothion, moxidectin, naled, 4-chloro-2-(2-chloro-2-methyl-propyl)-5-[(6-iodo-3-pyridyl)methoxy]pyridazin-3-one, nifluridide, nikkomycins, nitrilacarb, nitrilacarb 1:1 zinc chloride

complex, omethoate, oxydeprofos, oxydisulfoton, pp'-DDT, parathion, permethrin, phenkapton, phosalone, phosfolan, phosphamidon, polychloroterpenes, polynactins, proclonol, promacyl, propoxur, prothidathion, prothoate, pyrethrin I, pyrethrin II, pyrethrins, pyridaphenthion, pyrimitate, quinalphos, quintiofos, R-1492, phosglycin, rotenone, schradan, sebufos, selamectin, sophamide, SSI-121, sulfiram, sulfluramid, sulfotep, sulfur, diflovidazin, tau-fluvalinate, TEPP, terbam, tetradifon, tetrasul, thiafenox, thiocarboxime, thiofanox, thiometon, thioquinox, thuringiensin, triamiphos, triarathene, triazophos, triazuron, trifenofos, trinactin, vamidothion, vaniliprole, bethoxazin, copper dioctanoate, copper sulfate, cybutryne, dichlone, dichlorophen, endothal, fentin, hydrated lime, nabam, quinoclamine, quinonamid, simazine, triphenyltin acetate, triphenyltin hydroxide, crufomate, piperazine, thiophanate, chloralose, fenthion, pyridin-4-amine, strychnine, 1-hydroxy-1H-pyridine-2-thione, 4-(quinoxalin-2-ylamino)benzenesulfonamide, 8-hydroxyquinoline sulfate, bronopol, copper hydroxide, cresol, dipyrithione, dodicin, fenaminosulf, formaldehyde, hydrargaphen, kasugamycin, kasugamycin hydrochloride hydrate, nickel bis(dimethyldithiocarbamate), nitrapyrin, octhilinone, oxolinic acid, oxytetracycline, potassium hydroxyquinoline sulfate, probenazole, streptomycin, streptomycin sesquisulfate, tecloftalam, thiomersal, Adoxophyes orana GV, Agrobacterium radiobacter, Amblyseius spp., Anagrapha falcifera NPV, Anagrus atomus, Aphelinus abdominalis, Aphidius colemani, Aphidoletes aphidimyza, Autographa californica NPV, Bacillus sphaericus Neide, Beauveria brongniartii, Chrysoperla carnea, Cryptolaemus montrouzieri, Cydia pomonella GV, Dacnusa sibirica, Diglyphus isaea, Encarsia formosa, Eretmocerus eremicus, Heterorhabditis bacteriophora and H. megidis, Hippodamia convergens, Leptomastix dactylopii, Macrolophus caliginosus, Mamestra brassicae NPV, Metaphycus helvolus, Metarhizium anisopliae var. acridum, Metarhizium anisopliae var. anisopliae, Neodiprion sertifer NPV and N. lecontei NPV, Orius spp., Paecilomyces fumosoroseus, Phytoseiulus persimilis, Steinernema bibionis, Steinernema carpocapsae, Steinernema feltiae, Steinernema glaseri, Steinernema riobrave, Steinernema riobravis, Steinernema scapterisci, Steinernema spp., Trichogramma spp., Typhlodromus occidentalis, Verticillium lecanii, apholate, bisazir, busulfan, dimatif, hemel, hempa, metepa, methiotepa, methyl apholate, morzid, penfluron, tepa, thiohempa, thiotepa, tretamine, uredepa, (E)-dec-5-en-1-yl acetate with (E)-dec-5-en-1-ol, (E)-tridec-4-en-1-yl acetate, (E)-6-methylhept-2-en-4-ol, (E,Z)-tetradeca-4,10-dien-1-yl acetate, (Z)-dodec-7-en-1-yl acetate, (Z)-hexadec-11-enal, (Z)-hexadec-11-en-1-yl acetate, (Z)-hexadec-13-en-11-yn-1-yl acetate, (Z)-icos-13-en-10-one, (Z)-tetradec-7-en-1-al, (Z)-tetradec-9-en-1-ol, (Z)-tetradec-9-en-1-yl acetate, (7E,9Z)-dodeca-7,9-dien-1-yl acetate, (9Z,11E)-tetradeca-9,11-dien-1-yl acetate, (9Z,12E)-tetradeca-9,12-dien-1-yl acetate, 14-methyloctadec-1-ene, 4-methylnonan-5-ol with 4-methylnonan-5-one, alpha-multistriatin, brevicomin, codlelure, codlemone, cuelure, disparlure, dodec-8-en-1-yl acetate, dodec-9-en-1-yl acetate, dodeca-8, 10-dien-1-yl acetate,

dominicalure, ethyl 4-methyloctanoate, eugenol, frontalin, grandlure, grandlure I, grandlure II, grandlure III, grandlure IV, hexalure, ipsdienol, ipsenol, japonilure, lineatin, litlure, looplure, medlure, megatomoic acid, methyl eugenol, muscalure, octadeca-2,13-dien-1-yl acetate, octadeca-3,13-dien-1-yl acetate, orfralure, oryctalure, ostramone, siglure, sordidin, sulcatol, tetradec-11-en-1-yl acetate, trimedlure, trimedlure A, trimedlure B1, trimedlure B2, trimedlure C, trunc-call, 2-(octylthio)-ethanol, butopyronoxyl, butoxy(polypropylene glycol), dibutyl adipate, dibutyl phthalate, dibutyl succinate, diethyltoluamide, dimethyl carbate, dimethyl phthalate, ethyl hexanediol, hexamide, methoquin-butyl, methylneodecanamide, oxamate, picaridin, 1-dichloro-1-nitroethane, 1,1-dichloro-2,2-bis(4-ethylphenyl)-ethane, 1,2-dichloropropane with 1,3-dichloropropene, 1-bromo-2-chloroethane, 2,2,2-trichloro-1-(3,4-dichloro-phenyl)ethyl acetate, 2,2-dichlorovinyl 2-ethylsulfinylethyl methyl phosphate, 2-(1,3-dithiolan-2-yl)phenyl dimethylcarbamate, 2-(2-butoxyethoxy)ethyl thiocyanate, 2-(4,5-dimethyl-1,3-dioxolan-2-yl)phenyl methylcarbamate, 2-(4-chloro-3,5-xylyloxy)ethanol, 2-chlorovinyl diethyl phosphate, 2-imidazolidone, 2-isovalerylindan-1,3-dione, 2-methyl(prop-2-ynyl)aminophenyl methylcarbamate, 2-thiocyanatoethyl laurate, 3-bromo-1-chloroprop-1-ene, 3-methyl-1-phenylpyrazol-5-yl dimethyl-carbamate, 4-methyl(prop-2-ynyl)amino-3,5-xylyl methylcarbamate, 5,5-dimethyl-3-oxocyclohex-1-enyl dimethylcarbamate, acethion, acrylonitrile, aldrin, allosamidin, allyxycarb, alpha-ecdysone, aluminium phosphide, aminocarb, anabasine, athidathion, azamethiphos, Bacillus thuringiensis delta endotoxins, barium hexafluorosilicate, barium polysulfide, barthrin, Bayer 22/190, Bayer 22408, beta-cyfluthrin, beta-cypermethrin, bioethanomethrin, biopermethrin, bis(2-chloroethyl) ether, borax, bromfenvinfos, bromo-DDT, bufencarb, butacarb, butathiofos, butonate, calcium arsenate, calcium cyanide, carbon disulfide, carbon tetrachloride, cartap hydrochloride, cevadine, chlorbicyclen, chlordane, chlordecone, chloroform, chloropicrin, chlorphoxim, chlorprazophos, cis-resmethrin, cismethrin, clocythrin, copper acetoarsenite, copper arsenate, copper oleate, coumithoate, cryolite, CS 708, cyanofenphos, cyanophos, cyclethrin, cythioate, d-tetramethrin, DAEP, dazomet, decarbofuran, diamidafos, dicapthon, dichlofenthion, dicresyl, dicyclanil, dieldrin, diethyl 5-methylpyrazol-3-yl phosphate, dilor, dimefluthrin, dimetan, dimethrin, dimethylvinphos, dimetilan, dinoprop, dinosam, dinoseb, diofenolan, dioxabenzofos, dithicrofos, DSP, ecdysterone, EI 1642, EMPC, EPBP, etaphos, ethiofencarb, ethyl formate, ethylene dibromide, ethylene dichloride, ethylene oxide, EXD, fenchlorphos, fenethacarb, fenitrothion, fenoxacrim, fenpirithrin, fensulfothion, fenthion-ethyl, flucofuron, fosmethilan, fospirate, fosthietan, furathiocarb, furethrin, guazatine, guazatine acetates, sodium tetrathiocarbonate, halfenprox, HCH, HEOD, heptachlor, heterophos, HHDN, hydrogen cyanide, hyquincarb, IPSP, isazofos, isobenzan, isodrin, isofenphos, isolane, isoprothiolane, isoxathion, juvenile hormone I, juvenile hormone II, juvenile hormone III, kelevan, kinoprene, lead arsenate,

leptophos, lirimfos, lythidathion, m-cumenyl methylcarbamate, magnesium phosphide, mazidox, mecarphon, menazon, mercurous chloride, mesulfenfos, metam, metam-potassium, metam-sodium, methanesulfonyl fluoride, methocrotophos, methoprene, methothrin, methoxychlor, methyl isothiocyanate, methylchloroform, methylene chloride, metoxadiazone, mirex, naftalofos, naphthalene, NC-170, nicotine, nicotine sulfate, nithiazine, nornicotine, O-5-dichloro-4-iodophenyl O-ethyl ethylphosphonothioate, O,O-diethyl O-4-methyl-2-oxo-2H-chromen-7-yl phosphorothioate, O,O-diethyl O-6-methyl-2-propylpyrimidin-4-yl phosphorothioate, O,O,O',O'-tetrapropyl dithiopyrophosphate, oleic acid, para-dichlorobenzene, parathion-methyl, pentachlorophenol, pentachlorophenyl laurate, PH 60-38, phenkapton, phosnichlor, phosphine, phoxim-methyl, pirimetaphos, polychlorodicyclopentadiene isomers, potassium arsenite, potassium thiocyanate, precocene I, precocene II, precocene III, primidophos, profluthrin, promecarb, prothiofos, pyrazophos, pyresmethrin, quassia, quinalphos-methyl, quinothion, rafoxanide, resmethrin, rotenone, kadethrin, ryania, ryanodine, sabadilla, schradan, sebufos, SI-0009, thiapronil, sodium arsenite, sodium cyanide, sodium fluoride, sodium hexafluorosilicate, sodium pentachlorophenoxide, sodium selenate, sodium thiocyanate, sulcofuron, sulcofuron-sodium, sulfuryl fluoride, sulprofos, tar oils, tazimcarb, TDE, tebupirimfos, temephos, terallethrin, tetrachloroethane, thicrofos, thiocyclam, thiocyclam hydrogen oxalate, thionazin, thiosultap, thiosultap-sodium, tralomethrin, transpermethrin, triazamate, trichlormetaphos-3, trichloronat, trimethacarb, tolprocarb, triclopyricarb, triprene, veratridine, veratrine, XMC, zetamethrin, zinc phosphide, zolaprofos, meperfluthrin, tetramethylfluthrin, bis(tributyltin) oxide, bromoacetamide, ferric phosphate, niclosamide-olamine, tributyltin oxide, pyrimorph, trifenmorph, 1,2-dibromo-3-chloropropane, 1,3-dichloropropene, 3,4-dichlorotetrahydrothio-phene 1,1-dioxide, 3-(4-chlorophenyl)-5-methylrhodanine, 5-methyl-6-thioxo-1,3,5-thiadiazinan-3-ylacetic acid, 6-isopentenylaminopurine, anisiflupurin, benclothiaz, cytokinins, DCIP, furfural, isamidofos, kinetin, Myrothecium verrucaria composition, tetrachlorothiophene, xylenols, zeatin, potassium ethylxanthate, acibenzolar, acibenzolar-S-methyl, Reynoutria sachalinensis extract, alpha-chlorohydrin, antu, barium carbonate, bisthiosemi, brodifacoum, bromadiolone, bromethalin, chlorophacinone, cholecalciferol, coumachlor, coumafuryl, coumatetralyl, crimidine, difenacoum, difethialone, diphacinone, ergocalciferol, flocoumafen, fluoroacetamide, flupropadine, flupropadine hydrochloride, norbormide, phosacetim, phosphorus, pindone, pyrinuron, scilliroside, sodium fluoro-acetate, thallium sulfate, warfarin, 2-(2-butoxyethoxy)-ethyl piperonylate, 5-(1,3-benzodioxol-5-yl)-3-hexylcyclohex-2-enone, farnesol with nerolidol, verbutin, MGK 264, piperonyl butoxide, piprotal, propyl isomer, S421, sesamex, sesasmolin, sulfoxide, anthraquinone, copper naphthenate, copper oxychloride, dicyclopentadiene, thiram, zinc naphthenate, ziram, imanin, ribavirin, chloroinconazide, mercuric oxide, thiophanate-methyl,

azaconazole, bitertanol, bromuconazole, cyproconazole, difenoconazole, diniconazole, epoxicon-azole, fenbuconazole, fluquinconazole, flusilazole, flutriafol, furametpyr, hexaconazole, imazalil, imiben-con-azole, ipconazole, metconazole, myclobutanil, paclobutrazole, pefurazoate, penconazole, prothioconazole, pyrifenox, prochloraz, propiconazole, pyrisoxazole, simeconazole, tebucon-azole, tetraconazole, triadimefon, triadime-nol, triflumizole, triticonazole, ancymidol, fenarimol, nuarimol, bupirimate, dimethirimol, ethirimol, dodemorph, fenpropidin, fenpropimorph, spiroxamine, tridemorph, cyprodinil, mepanipyrim, pyrimethanil, fenpiclonil, fludioxonil, benalaxyl, furalaxyl, meta-laxyl, R-metalaxyl, ofurace, oxadixyl, carbendazim, debacarb, fuberidazole, thiaben-dazole, chlozolinate, dichlozoline, myclozoline, procymi-done, vinclozoline, boscalid, carboxin, fenfuram, flutolanil, mepronil, oxycarboxin, penthiopyrad, thifluzamide, dodine, iminoctadine, azoxystrobin, dimoxystrobin, enestroburin, fenaminstrobin, flufenoxystrobin, fluoxastrobin, kresoxim-methyl, metomi-nostrobin, trifloxystrobin, orysastrobin, picoxystrobin, pyraclostrobin, pyrametostrobin, pyraoxystrobin, ferbam, mancozeb, maneb, metiram, propineb, zineb, captafol, captan, fluoroimide, folpet, tolylfluanid, bordeaux mixture, copper oxide, mancopper, oxine-copper, nitrothal-isopropyl, edifenphos, iprobenphos, phosdiphen, tolclofos-methyl, anilazine, benthiavalicarb, blasticidin-S, chloroneb, chloro-tha-lo-nil, cyflufenamid, cymoxanil, cyclobutrifluram, diclocymet, diclomezine, dicloran, diethofencarb, dimetho-morph, flumorph, dithianon, ethaboxam, etridiazole, famoxa-done, fenamidone, fenoxanil, ferimzone, fluazinam, flumetylsulforim, fluopicolide, fluoxytioconazole, flusulfamide, fluxapyroxad, fenhexamid, fos-etyl-aluminium, hymexazol, iprovalicarb, cyazofamid, methasulfo-carb, metrafenone, pencycuron, phthalide, polyoxins, propamocarb, pyribencarb, proquinazid, pyroquilon, pyriofenone, quinoxyfen, quintozene, tiadinil, triazoxide, tricyclazole, triforine, validamycin, valifenalate, zoxamide, mandipropamid, flubeneteram, isopyrazam, sedaxane, benzovindiflupyr, pydiflumetofen, 3-difluoromethyl-1-methyl-1H-pyrazole-4-carboxylic acid (3',4',5'-trifluoro-biphenyl-2-yl)-amide, isoflucypram, isotianil, dipymetitrone, 6-ethyl-5,7-dioxo-pyrrolo[4,5][1,4]dithiino[1,2-c]isothiazole-3-carbonitrile, 2-(difluoromethyl)-N-[3-ethyl-1,1-dimethyl-indan-4-yl]pyridine-3-carboxamide, 4-(2,6-difluorophenyl)-6-methyl-5-phenyl-pyridazine-3-carbonitrile, (R)-3-(difluoromethyl)-1-methyl-N-[1,1,3-trimethylindan-4-yl]pyrazole-4-carboxamide, 4-(2-bromo-4-fluoro-phenyl)-N-(2-chloro-6-fluoro-phenyl)-2,5-dimethyl-pyrazol-3-amine, 4- (2- bromo- 4- fluorophenyl) - N- (2- chloro- 6- fluorophenyl) - 1, 3- dimethyl- 1H- pyrazol- 5- amine, fluindapyr, coumethoxystrobin (jiaxiangjunzhi), lvbenmixianan, dichlobentiazox, mandestrobin, 3-(4,4-difluoro-3,4-dihydro-3,3-dimethylisoquinolin-1-yl)quinolone, 2-[2-fluoro-6-[(8-fluoro-2-methyl-3-quinolyl)oxy]phenyl]propan-2-ol, oxathiapiprolin, tert-butyl N-[6-[[[(1-methyltetrazol-5-yl)-phenyl-methylene]amino]oxymethyl]-2-pyridyl]carbamate, pyraziflumid, inpyrfluxam, trolprocarb, mefentrifluconazole, ipfentrifluconazole, 2-(difluoromethyl)-N-[(3R)-3-

ethyl-1,1-dimethyl-indan-4-yl]pyridine-3-carboxamide, N'-(2,5-dimethyl-4-phenoxy-phenyl)-N-ethyl-N-methyl-formamidine, N'-[4-(4,5-dichlorothiazol-2-yl)oxy-2,5-dimethyl-phenyl]-N-ethyl-N-methyl-formamidine, [2-[3-[2-[1-[2-[3,5-bis(difluoromethyl)pyrazol-1-yl]acetyl]-4-piperidyl]thiazol-4-yl]-4,5-dihydroisoxazol-5-yl]-3-chloro-phenyl] methanesulfonate, but-3-ynyl N-[6-[[(Z)-[(1-methyltetrazol-5-yl)-phenyl-methylene]amino]oxymethyl]-2-pyridyl]carbamate, methyl N-[[5-[4-(2,4-dimethylphenyl)triazol-2-yl]-2-methyl-phenyl]methyl]carbamate, 3-chloro-6-methyl-5-phenyl-4-(2,4,6-trifluorophenyl)pyridazine, pyridachlometyl, 3-(difluoromethyl)-1-methyl-N-[1,1,3-trimethylindan-4-yl]pyrazole-4-carboxamide, 1-[2-[[1-(4-chlorophenyl)pyrazol-3-yl]oxymethyl]-3-methyl-phenyl]-4-methyl-tetrazol-5-one, 1-methyl-4-[3-methyl-2-[[2-methyl-4-(3,4,5-trimethylpyrazol-1-yl)phenoxy]methyl]phenyl]tetrazol-5-one, aminopyrifen, ametoctradin, amisulbrom, penflufen, (Z,2E)-5-[1-(4-chlorophenyl)pyrazol-3-yl]oxy-2-methoxyimino-N,3-dimethyl-pent-3-enamide, florylpicoxamid, fenpicoxamid, metarylpicoxamid, tebufloquin, ipflufenoquin, quinofumelin, isofetamid, ethyl 1-[[4-[[2-(trifluoromethyl)-1,3-dioxolan-2-yl]methoxy]phenyl]methyl]pyrazole-3-carboxylate (may be prepared from the methods described in WO 2020/056090), ethyl 1-[[4-[(Z)-2-ethoxy-3,3,3-trifluoro-prop-1-enoxy]phenyl]methyl]pyrazole-3-carboxylate (may be prepared from the methods described in WO 2020/056090), methyl N-[[4-[1-(4-cyclopropyl-2,6-difluoro-phenyl)pyrazol-4-yl]-2-methyl-phenyl]methyl]carbamate (may be prepared from the methods described in WO 2020/097012), methyl N-[[4-[1-(2,6-difluoro-4-isopropyl-phenyl)pyrazol-4-yl]-2-methyl-phenyl]methyl]carbamate (may be prepared from the methods described in WO 2020/097012), N-[2-[2,4-dichloro-phenoxy]phenyl]-3-(difluoromethyl)-1-methyl-pyrazole-4-carboxamide, N-[2-[2-chloro-4-(trifluoromethyl)phenoxy]phenyl]-3-(difluoromethyl)-1-methyl-pyrazole-4-carboxamide, benzothiostrobin, phenamacril, 5-amino-1,3,4-thiadiazole-2-thiol zinc salt (2:1), fluopyram, flufenoxadiazam, flutianil, fluopimomide, pyrapropoyne, picarbutrazox, 2-(difluoromethyl)-N-(3-ethyl-1,1-dimethyl-indan-4-yl)pyridine-3-carboxamide, 2- (difluoromethyl) - N-((3R) - 1, 1, 3- trimethylindan- 4-yl) pyridine- 3- carboxamide, 4-[[6-[2-(2,4-difluorophenyl)-1,1-difluoro-2-hydroxy-3-(1,2,4-triazol-1-yl)propyl]-3-pyridyl]oxy]benzonitrile, metyltetraprole, 2-(difluoromethyl) - N- ((3R) - 1, 1, 3- trimethylindan- 4- yl) pyridine- 3- carboxamide, α- (1, 1-dimethylethyl) - α- [4'- (trifluoromethoxy) [1, 1'- biphenyl] - 4- yl] -5- pyrimidinemethanol, fluoxapiprolin, enoxastrobin, 4-[[6-[2-(2,4-difluorophenyl)-1,1-difluoro-2-hydroxy-3-(1,2,4-triazol-1-yl)propyl]-3-pyridyl]oxy] benzonitrile, 4-[[6-[2-(2,4-difluorophenyl)-1,1-difluoro-2-hydroxy-3-(5-sulfanyl-1,2,4-triazol-1-yl)propyl]-3-pyridyl]oxy] benzonitrile, 4-[[6-[2-(2,4-difluorophenyl)-1,1-difluoro-2-hydroxy-3-(5-thioxo-4H-1,2,4-triazol-1-yl)propyl]-3-pyridyl]oxy]benzonitrile, trinexapac, coumoxystrobin, zhongshengmycin, thiodiazole copper, zinc thiazole, amectotractin, iprodione, seboctylamine, N'-[5-bromo-2-methyl-6-[(1S)-1-methyl-2-propoxy-ethoxy]-3-pyridyl]-N-ethyl-N-

methyl-formamidine, N'-[5-bromo-2-methyl-6-[(1R)-1-methyl-2-propoxy-ethoxy]-3-pyridyl]-N-ethyl-N-methyl-formamidine, N'-[5-bromo-2-methyl-6-(1-methyl-2-propoxy-ethoxy)-3-pyridyl]-N-ethyl-N-methyl-formamidine, N'-[5-chloro-2-methyl-6-(1-methyl-2-propoxy-ethoxy)-3-pyridyl]-N-ethyl-N-methyl-formamidine, N'-[5-bromo-2-methyl-6-(1-methyl-2-propoxy-ethoxy)-3-pyridyl]-N-isopropyl-N-methyl-formamidine (these compounds may be prepared from the methods described in WO2015/155075); N'-[5-bromo-2-methyl-6-(2-propoxypropoxy)-3-pyridyl]-N-ethyl-N-methyl-formamidine (this compound may be prepared from the methods described in IPCOM000249876D); N-isopropyl-N'-[5-methoxy-2-methyl-4-(2,2,2-trifluoro-1-hydroxy-1-phenyl-ethyl)phenyl]-N-methyl-formamidine, N'-[4-(1-cyclopropyl-2,2,2-trifluoro-1-hydroxy-ethyl)-5-methoxy-2-methyl-phenyl]-N-isopropyl-N-methyl-formamidine (these compounds may be prepared from the methods described in WO2018/228896); N-ethyl-N'-[5-methoxy-2-methyl-4-[(2-trifluoromethyl)oxetan-2-yl]phenyl]-N-methyl-formamidine, N-ethyl-N'-[5-methoxy-2-methyl-4-[(2-trifuoromethyl)tetrahydrofuran-2-yl]phenyl]-N-methyl-formamidine (these compounds may be prepared from the methods described in WO2019/110427); N-[(1R)-1-benzyl-3-chloro-1-methyl-but-3-enyl]-8-fluoro-quinoline-3-carboxamide, N-[(1S)-1-benzyl-3-chloro-1-methyl-but-3-enyl]-8-fluoro-quinoline-3-carboxamide, N-[(1R)-1-benzyl-3,3,3-trifluoro-1-methyl-propyl]-8-fluoro-quinoline-3-carboxamide, N-[(1S)-1-benzyl-3,3,3-trifluoro-1-methyl-propyl]-8-fluoro-quinoline-3-carboxamide, N-[(1R)-1-benzyl-1,3-dimethyl-butyl]-7,8-difluoro-quinoline-3-carboxamide,

N-[(1S)-1-benzyl-1,3-dimethyl-butyl]-7,8-difluoro-quinoline-3-carboxamide, 8-fluoro-N-[(1R)-1-[(3-fluorophenyl)methyl]-1,3-dimethyl-butyl]quinoline-3-carboxamide, 8-fluoro-N-[(1S)-1-[(3-fluorophenyl)methyl]-1,3-dimethyl-butyl]quinoline-3-carboxamide, N-[(1R)-1-benzyl-1,3-dimethyl-butyl]-8-fluoro-quinoline-3-carboxamide, N-[(1S)-1-benzyl-1,3-dimethyl-butyl]-8-fluoro-quinoline-3-carboxamide,

N-((1R)-1-benzyl-3-chloro-1-methyl-but-3-enyl)-8-fluoro-quinoline-3-carboxamide, N-((1S)-1-benzyl-3-chloro-1-methyl-but-3-enyl)-8-fluoro-quinoline-3-carboxamide (these compounds may be prepared from the methods described in WO2017/153380); 1-(6,7-dimethylpyrazolo[1,5-a]pyridin-3-yl)-4,4,5-trifluoro-3,3-dimethyl-isoquinoline, 1-(6,7-dimethylpyrazolo[1,5-a]pyridin-3-yl)-4,4,6-trifluoro-3,3-dimethyl-isoquinoline, 4,4-difluoro-3,3-dimethyl-1-(6-methylpyrazolo[1,5-a]pyridin-3-yl)isoquinoline, 4,4-difluoro-3,3-dimethyl-1-(7-methylpyrazolo[1,5-a]pyridin-3-yl)isoquinoline, 1-(6-chloro-7-methyl-pyrazolo[1,5-a]pyridin-3-yl)-4,4-difluoro-3,3-dimethyl-isoquinoline (these compounds may be prepared from the methods described in WO2017/025510); 1-(4,5-dimethylbenzimidazol-1-yl)-4,4,5-trifluoro-3,3-dimethyl-isoquinoline, 1-(4,5-dimethylbenzimidazol-1-yl)-4,4-difluoro-3,3-dimethyl-

isoquinoline, 6-chloro-4,4-difluoro-3,3-dimethyl-1-(4-methylbenzimidazol-1-yl)isoquinoline, 4,4-difluoro-1-(5-fluoro-4-methyl-benzimidazol-1-yl)-3,3-dimethyl-isoquinoline, 3-(4,4-difluoro-3,3-dimethyl-1-isoquinolyl)-7,8-dihydro-6H-cyclopenta[e]benzimidazole (these compounds may be prepared from the methods described in WO2016/156085); N-methoxy-N-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]cyclopropanecarboxamide, N,2-dimethoxy-N-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]propanamide, N-ethyl-2-methyl-N-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]propanamide, 1-methoxy-3-methyl-1-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]urea, 1,3-dimethoxy-1-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]urea, 3-ethyl-1-methoxy-1-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]urea, N-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]propanamide, 4,4-dimethyl-2-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]isoxazolidin-3-one, 5,5-dimethyl-2-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]isoxazolidin-3-one, ethyl 1-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]pyrazole-4-carboxylate, N,N-dimethyl-1-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methyl]-1,2,4-triazol-3-amine (these compounds may be prepared from the methods described in WO 2017/055473, WO 2017/055469, WO 2017/093348 and WO 2017/118689); 2-[6-(4-chlorophenoxy)-2-(trifluoromethyl)-3-pyridyl]-1-(1,2,4-triazol-1-yl)propan-2-ol (this compound may be prepared from the methods described in WO 2017/029179); 2-[6-(4-bromophenoxy)-2-(trifluoromethyl)-3-pyridyl]-1-(1,2,4-triazol-1-yl)propan-2-ol (this compound may be prepared from the methods described in WO 2017/029179); 3-[2-(1-chlorocyclopropyl)-3-(2-fluorophenyl)-2-hydroxy-propyl]imidazole-4-carbonitrile (this compound may be prepared from the methods described in WO 2016/156290); 3-[2-(1-chlorocyclopropyl)-3-(3-chloro-2-fluoro-phenyl)-2-hydroxy-propyl]imidazole-4-carbonitrile (this compound may be prepared from the methods described in WO 2016/156290); (4-phenoxyphenyl)methyl 2-amino-6-methyl-pyridine-3-carboxylate (this compound may be prepared from the methods described in WO 2014/006945); 2,6-Dimethyl-1H,5H-[1,4]dithiino[2,3-c:5,6-c']dipyrrole-1,3,5,7(2H,6H)-tetrone (this compound may be prepared from the methods described in WO 2011/138281) N-methyl-4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]benzenecarbothioamide; N-methyl-4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]benzamide; (Z,2E)-5-[1-(2,4-dichlorophenyl)pyrazol-3-yl]oxy-2-methoxyimino-N,3-dimethyl-pent-3-enamide (this compound may be prepared from the methods described in WO 2018/153707); N'-(2-chloro-5-methyl-4-phenoxy-phenyl)-N-ethyl-N-methyl-formamidine; N'-[2-chloro-4-(2-fluorophenoxy)-5-methyl-phenyl]-N-ethyl-N-methyl-formamidine (this compound may be prepared from the methods described in WO 2016/202742); 2-(difluoromethyl)-N-[(3S)-3-ethyl-1,1-dimethyl-indan-4-yl]pyridine-3-carboxamide (this compound may be prepared from the methods described in WO 2014/095675);

(5-methyl-2-pyridyl)-[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methanone, (3-methylisoxazol-5-yl)-[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]methanone (these compounds may be prepared from the methods described in WO 2017/220485); 2-oxo-N-propyl-2-[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]acetamide (this compound may be prepared from the methods described in WO 2018/065414); ethyl 1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-4-carboxylate (this compound may be prepared from the methods described in WO 2018/158365); 2,2-difluoro-N-methyl-2-[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]phenyl]acetamide, N-[(E)-methoxyiminomethyl]-4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]benzamide, N-[(Z)-methoxyiminomethyl]-4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]benzamide, N-[N-methoxy-C-methyl-carbonimidoyl]-4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]benzamide (these compounds may be prepared from the methods described in WO 2018/202428).

In particular, the compositions as described herein have been found to demonstrate superior tank-mix stability with one or more of the components listed in Table B below.

Table B

Common Name	**Structural Name**
captan	1,2,3,6-Tetrahydro-N-(trichlormethylthio)-phthalimid
dithianon	2,3-Dicyano-1,4-dithioanthrachinon
potassium phosphonate	-
sulphur	-
difenoconazole	1-{2-[4-(4-chlorophenoxy)-2-chlorophenyl-(4-methyl-1,3-dioxolan-2-yl)-methyl]}-1H-1,2,4-triazole
pirimicarb	carbamic acid, dimethyl-, 2-(dimethylamino)-5,6-dimethyl-4-pyrimidinyl ester
Emamectin (benzoate)	avermectin B1, 4-deoxy-4-(methylamino)-(4R)-, benzoate (salt)
flonicamid	N-(cyanomethyl)-4-(trifluoromethyl)- 3-pyridinecarboxamide
cyflufenamid	(Z)-N-[[(cyclopropylmethoxy)amino][2,3-difluoro-6-(trifluoromethyl)phenyl]methylene]benzeneacetamide
phosphonate	phosphonic acid, dipotassium salt
fluxapiroxad	3-(difluoromethyl)-1-methyl-N-(3',4',5'-trifluoro[1,1'-biphenyl]-2-yl)-1H-pyrazole-4-carboxamide
penconazole	1-[2-(2,4-dichlorophenyl)pentyl]-1H-1,2,4-Triazole
sulfoxaflor	N-[methyloxido[1-[6-(trifluoromethyl)-3-pyridinyl]ethyl]-.lambda.4-sulfanylidene]- cyanamide
chlorantranilliprole	3-bromo-N-[4-chloro-2-methyl-6-[(methylamino)carbonyl]phenyl]-1-(3-chloro-2-pyridinyl)-1H-pyrazole-5-carboxamide
cyantraniliprole	3-bromo-1-(3-chloro-2-pyridinyl)-N-[4-cyano-2-methyl-6-[(methylamino)carbonyl]phenyl]-1H-Pyrazole-5-carboxamide
mandipropamid	4-chloro-N-[2-[3-methoxy-4-(2-propynyloxy)phenyl]ethyl]-alpha-(2-propynyloxy)- benzeneacetamide

zoxamide	3,5-dichloro-N-(3-chloro-1-ethyl-1-methyl-2-oxopropyl)-4-methyl-benzamide
lambda-cyhalothrin	3-(2-chloro-3,3,3-trifluoro-1-propenyl)-2,2-dimethyl-, cyano(3-phenoxyphenyl)methyl ester, [1.alpha.(S*),3.alpha.(Z)]-(.+-.)-cyclopropanecarboxylic acid
azoxystrobin	2-[[6-(2-cyanophenoxy)-4-pyrimidinyl]oxy]-alpha-(methoxymethylene)-, methyl ester, (alpha E)-benzeneacetic acid
Isabion	Protein hydrolyzates
spiroxamine	8-(1,1-dimethylethyl)-N-ethyl-N-propyl-1,4-dioxaspiro[4,5]decane-2-methanamine
copper	-

Unless otherwise stated are percentages are given as percentages by total weight and all embodiments and preferred features may be combined in any combination.

The invention is described by the following non-limiting Examples.

Examples

Compositions according to the invention (Compositions **1** and **A**), together with a broad range of comparative compositions, were prepared with the components as set out in Tables 1 and 3.

Methodology

The prepared compositions were tested for a wide range of properties as set out below, with the results presented in Tables 2 and 4.

Wet sieve residue

Cyprodinil is sensitive to temperature in combination with water and a high wet sieve residue can result due to high temperatures during production. The following test was therefore established to establish suitable parameters for commercial product with the limit for a good quality product being <0.2% of residue.

50 g of product was poured into 500 mL of water. After 1 minute of standing, it was stirred for 5 minutes and the resulting suspension is then poured over a 45 µm fine mesh sieve. The sieve was rinsed for up to 10 minutes with tap water. The residue on the sieve was collected, dried and weighed. The result is presented as a percentage against the initial 50 g.

Suspensibility

2.5g of product was weighed into a 30 °C preheated cylinder with 250 mL of water. The cylinder is inverted 180° for 30 times to disperse the product. Afterwards the cylinder is put into a 30 °C water bath and left standing for 30 minutes. Once the time is up, the top 90% of the suspension are removed and the rest is transferred into a glass beaker to be dried and weighed. The dried residue was used to calculate the suspensibility of the product. A minimum of 80% is necessary for a good product with lower numbers indicating insufficient dispersing agent or too much insoluble solid material in the composition.

Storage

Samples are stored for two weeks at 54 °C. The tests above are then repeated to determine shelf life and stability. If the Wet Sieve and/or Suspensibility results are very bad the samples were not stored and given an 'NDA' rating.

Leaf Residue

The presence of leaf residue was confirmed or denied through visual inspection.

Table 1

Compound	1	2	3	4	5	6	7	8	9	10	11
Cyprodinil	50	50	50	50	50	50	50	50	50	50	50
mixture of isomers of dibutylnaphthalene sulphonic acid sodium-salt		5									
2,5-furandione, polymer with 2,4,4-trimethylpentene, sodium salt and benzenesulfonic acid, dodecyl, sodium salt		2									
naphthalenesulfonic acid, sodium salt condensed with formaldehyde	5	15	22	22	17	17	10	5	8	5	20
sodium lignosulfonate	2							2	2	2	
Oxirane, 2-methyl-, polymer with oxirane, block						5		5			
sodium sulphate anhydrous		5			5		2			5	10
Antifoam		1									
silicone antifoam powder water dispersible	2		2	2	2	2		2	2	2	1
silicium oxide		12		13	13	13					
lactose cryst. monohydrate	41		26	13	13	13	38	36	38	36	19
urea polymer with formaldehyde		10									

Table 2 – Results

Test		1	2	3	4	5	6	7	8	9	10	11
Wet sieve residue [%],	initial	0.01	0.09	100	0.01	0.01	100	100	100	0.06	0.23	1.8
Suspensibility [%]	initial	98	96	1	95	91	1	1	1	96	94	83
Wet sieve residue [%]	after storage	0.01	100	nda	0.01	0.01	nda	nda	nda	0.181	0.96	nda
Suspensibility [%]	after storage	94	32	nda	89	71	nda	nda	nda	good	good	nda
Leaf residue	initial	N	Y	N	Y	Y	Y	N	N	N	N	N

Table 3

Compound	A	B	C	D	E	F	G	H	I	J	K
Cyprodinil	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5
Fludioxonil	25	25	25	25	25	25	25	25	25	25	25
mixture of isomers of dibutylnaphthalene sulphonic acid sodium-salt		3	3	3	5						
2,5-furandione, polymer with 2,4,4-trimethylpentene, sodium salt and benzenesulfonic acid, dodecyl, sodium salt		1	1	1							2
naphthalenesulfonic acid, sodium salt condensed with formaldehyde	5	10	10	10	15	15	15	15	15	8	10
sodium lignosulfonate	2									2	
Oxirane, 2-methyl-, polymer with oxirane, block									5	5	5
sodium sulphate anhydrous		5	5	5	5	6.5	6.5	6.5		5	5
Antifoam		1									
silicone antifoam powder water dispersible	2		1	1	1	1	2	2	2	2	2
silicium oxide (natural diatomatous earth)		11.5	11.5	11.5			14	9	15.5	15.5	13.5
lactose cryst. monohydrate	28.5		6		11.5	15					
Calcium carbonate											
Maize starch								5			
Synthetic amorphous silica				6							
urea polymer with formaldehyde		6									

Table 4 – Results

Test		A	B	C	D	E	F	G	H	I	J	K
Wet sieve residue [%],	initial	0.05	0.05	2	6	100	0.06	0.01	0.01	100	0.01	100
Suspensibility [%]	initial	95	84	93	80	1	93	82	92	1	93	1
Wet sieve residue [%]	after storage	0.1	100	nda	nda	nda	1.4	1.6	0.01	nda	nda	nda
Suspensibility [%]	after storage	90	22	nda	nda	nda	85	81	91	nda	nda	nda
Leaf residue	initial	N	Y	Y	Y	N	N	Y	Y	Y	Y	Y

In the tables above, only the compositions according to the invention demonstrate the necessary combination of technical properties required for a next generation, microplastic-free formulation.

The invention is defined by the claims.

Claims

1. A composition comprising cyprodinil and a lactose-based filler.

2. A composition according to claim 1 comprising no or substantially no microplastics.

3. A composition according to claim 1 or 2 wherein the composition is in the form of water-dispersible granules (WG).

4. A composition according to any of the preceding claims, wherein the cyprodinil is present in an amount of from 30 to 60% by weight.

5. A composition according to the any the preceding claims that further comprises fludioxinil.

6. A composition according to claim 4, wherein the fludioxinil is present in an amount of from 20 to 30% by weight.

7. A composition according to any of the preceding claims wherein the lactose-based filler is present in an amount of 20 to 50% by weight.

8. A composition according to any of the preceding claims comprising one or more dispersants, preferably in an amount of from 0.001 to 10% by weight.

9. A composition according to claim 7, wherein the one or more dispersants are selected from naphthalenesulfonic acid condensed with formaldehyde and/or lignosulphonate.

10. A composition according to any of the preceding claims where the composition contains no, or substantially no, sodium sulphate, silicium oxide, calcium carbonate, starch, silica and/or polyurea-based polymers.

11. A composition according to any of the preceding claims, wherein the composition demonstrates less than 0.2% residue when tested by the Wet Sieve Methodology.

12. A method of preparing a composition as defined in any of claims 1 to 10, preferably through extrusion.

13. A method of controlling or preventing phytopathogenic diseases, especially phytopathogenic fungi, on useful plants or on propagation material thereof, which comprises applying to the useful plants, the locus thereof or propagation material thereof a composition as defined in any one of claims 1 to 10.

14. A method according to claim 12, wherein fungi is selected from one or more of Botrytis, *Monilinia, Nectria, Penicillium, Colletotrichum, Fusarium, Gloeosporium, Alternaria, Venturia, Sclerotinia, Stemphylium, Mycosphaerella*, and *Ascochyta*.

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2024/052980

A. CLASSIFICATION OF SUBJECT MATTER
INV. A01N25/04 A01N25/12 A01N25/22 A01N43/36 A01N43/54
A01P3/00
ADD.
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

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

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

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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Y	WO 2013/087417 A1 (BASF SE [DE]; TARANTA CLAUDE [DE] ET AL.) 20 June 2013 (2013-06-20) the claims; the examples and page 3, entries E and F	1-14
X	US 2016/007592 A1 (TAKABE RIE [JP] ET AL) 14 January 2016 (2016-01-14)	1-13
Y	the claims; the examples and paragraphs 6, 7, 14, 15, 21-25, 34-41, 49, 53, 54, 57, 61, 62, 84-86, 89, 90, 93, 122 and 123	1-14

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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance;; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance;; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
14 April 2024	22/04/2024

Name and mailing address of the ISA/	Authorized officer
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INTERNATIONAL SEARCH REPORT

International application No
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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
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