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(54) Title: USE OF FLUOPYRAM AND/OR BACILLUS SUBTILIS FOR CONTROLLING FUSARIUM WILT IN PLANTS OF THE MUSACEAE FAMILY

(57) Abstract: The present invention relates the use of Fluopyram and/or Bacillus subtilis for Fusarium wilt in plants of the Musaceae family, in particular of the genus Musa. Furthermore it relates to a method useful for controlling Fusarium wilt in plants of the Musaceae family, in particular of the genus Musa.

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Use of Fluopyram and/or Bacillus subtilis for controlling Fusarium wilt in plants of the Musaceae family

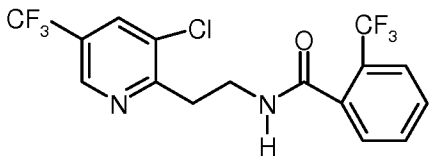
Field of the Invention

The present invention relates generally to the use of the compound of the formula (I) (Fluopyram) and/or Bacillus subtilis, in particular strain QST 713 for controlling Fusarium wilt in plants of the Musaceae family, in particular of the genus Musa.

Furthermore, the present invention relates to a method particularly useful for controlling Fusarium wilt in plants of the Musaceae family, in particular of the genus Musa by using Fluopyram and/or Bacillus subtilis, in particular strain QST 713 in different application patterns.

Description of the Current Technology

Fluopyram is a compound according to formula (I)



(I)

having the chemical name N-{2-[3-chloro-5-(trifluoromethyl)-2-pyridinyl]ethyl}-2-trifluoromethyl¬benzamide of formula (I). The fungicidal activity as well as its production is described in WO-A 2004/16088, its nematicidal activity is described in WO-A 2008/126922.

Bacillus subtilis subspecies are known as fungicidal biologicals. In particular Bacillus subtilis strain QST 713 is known as a fungicide (US 6,060,051, US 6,103,228, US 6,291,426, and US 6,417,163) and marketed as such under the trade name Serenade.

Banana cultivation is affected by numerous fungal disease. A major disease in bananas is Fusarium wilt or the Panama disease leading to severe losses in banana plantations worldwide. Fusarium wilt is caused by the soilborne fungus Fusarium oxysporum f. sp. Cubense (FOC). Different races of FOC have been identified like TR4 (Tropical race 4) infecting bananas of the variety Cavendish) or STR4 (Suptropical race 4) which need further infection promoting factors like low temperatures and water logging. Other races are races 1 to 4. The fungus spreads over planting material, infested soil or water. Common banana varieties like Gros Michel, Silk, Pome and Pisang awak cultivars are resistant to race 2 strains but susceptible to races 1 and 4

strains. Cavendish cultivars are resistant to races 1 and 2 strains but susceptible to race 4 strains. Plantain and East African highland bananas (EAHB) cultivars are generally resistant to race 1 strains.

Fusarium wilt is a typical vascular wilt disease. The fungus invades the vascular tissue through the roots causing discolouration and wilting, eventually killing the plant. The progress of the internal symptoms can influence the first appearance of the external symptoms. The fruit do not exhibit any symptom. The characteristic internal symptom of Fusarium wilt is vascular discolouration, which varies from pale yellow in the early stages to dark red or almost black in later stages. Internal symptoms first develop in the feeder roots, which are the initial infection sites. The fungus spreads to the rhizome and then the pseudostem. Externally, the first signs of disease are usually wilting and yellowing of the older leaves around the margins. The yellow leaves may remain erect or collapse at the petiole. Sometimes, the leaves remain green, except for spots on the petiole, but still snap. The collapsed leaves hang down the pseudostem like a skirt. Eventually, all the leaves fall down and dry up. Splitting of the base of the pseudostem is another common symptom. Other symptoms include irregular, pale margins on new leaves and the wrinkling and distortion of the leaf blade. Infected suckers do not start showing symptoms of Fusarium wilt until they are about 4 months old, a situation that has contributed to the spread of the disease through planting material. The fruit does not show any specific disease symptoms (http://www.promusa.org/Fusarium+wilt and Randy C. Ploetz, Phytopathology (2015), Vol 105, No 12, pp 1512-1521).

Fusarium wilt cannot be controlled by classical agrochemicals or fungicides or by fumigants. Efforts to control the disease were spent breeding for resistant varieties with limited success.

SUMMARY OF THE INVENTION

However, it has now been found, that Fluopyram and/or Bacillus subtilis, in particular strain QST 713 for controlling Fusarium wilt in plants of the Musaceae family, in particular of the genus Musa.

Accordingly, the present invention also relates to the use of compositions comprising Fluopyram and/or Bacillus subtilis, in particular strain QST 713 for controlling Fusarium wilt in plants of the Musaceae family.

Accordingly, the present invention also relates to the use of compositions comprising

A) Fluopyram and/or Bacillus subtilis, in particular strain QST 713

B) at least further one agrochemically active compound and/or

for controlling Fusarium wilt in plants of the Musaceae family, in particular of the genus Musa.

An exemplary method of the invention comprises applying Fluopyram and/or Bacillus subtilis, in particular strain QST 713 in plants of the Musaceae family, in particular of the genus Musa of the invention to either soil or a plant to control Fusarium wilt.

In the context of the present invention, "control of *Fusarium wilt*" means a reduction in infestation by Fusarium oxysporum f. sp. Cubense, compared with the untreated plant, or the plant product, measured as efficacy, preferably a reduction by 25-50 %, compared with the untreated plant or the plant product (100 %), more preferably a reduction by 40-79 %, compared with the the untreated plant or the plant product (100 %); even more preferably, the infection by phytopathogenic microorganisms is entirely suppressed (by 70-100 %). The control may be curative, i.e. for treatment of the plant or the plant product which have been infected or protective, for protection of the untreated plant or the plant product, which have not yet been infected.

In the context of the present invention Fluopyram and/or Bacillus subtilis, in particular strain QST 713 may be a composition (i. e. a physical mixture) comprising Fluopyram, Fluopyram and Bacillus subtilis, in particular strain QST 713 or Fluopyram or Bacillus subtilis, in particular strain QST 713. It may also be a combination of compounds of Fluopyram and Bacillus subtilis, in particular strain QST 713 composed from separate formulations of the single active ingredient components being Fluopyram and Bacillus subtilis, in particular strain QST 713 (tank-mix). Another example of a combination of Fluopyram and Bacillus subtilis, in particular strain QST 713 is that Fluopyram and Bacillus subtilis, in particular strain QST 713 are not present together in the same formulation, but packaged separately (combipack), i.e., not jointly preformulated. As such, combipacks include one or more separate containers such as vials, cans, bottles, pouches, bags or canisters, each container containing a separate component for an agrochemical composition, here Fluopyram and Bacillus subtilis, in particular strain QST 713. One example is a two-component combipack. Accordingly the present invention also relates to a two-component combipack, comprising a first component which in turn comprises Fluopyram, a liquid or solid carrier and, if appropriate, at least one surfactant and/or at least one customary auxiliary, and a second component which in turn comprises Bacillus subtilis, in particular strain QST 713, a liquid or solid carrier and, if appropriate, at least one surfactant and/or at least one customary auxiliary. More details, e.g. as to suitable liquid and solid carriers, surfactants and customary auxiliaries are described below.

A combination according to the invention shall mean/encompass a composition, a tank mix, or a combipack.

Fusarium wilt shall encompass the disease caused by Fusarium oxysporum f. sp. Cubense, including all races of Fusarium oxysporum f. sp. Cubense, including but not limited to race 1, 2, 3, 4, TR4, STR 4.

An "effective amount" means an amount of and/or Bacillus subtilis, in particular strain QST 713 which is sufficient to control Fusarium oxysporum f. sp. Cubense in a satisfactory manner or to eradicate Fusarium oxysporum f. sp. Cubense completely, and which, at the same time, does not cause any significant symptoms of phytotoxicity. In general, this application rate may vary within a relatively wide range. It depends on several factors, for example on the life stage of Fusarium oxysporum f. sp. Cubense to be controlled, the plant, the climatic conditions and the ingredients of the inventive compositions.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Disclosed is the use of Fluopyram and/or Bacillus subtilis, in particular strain QST 713 for controlling Fusarium wilt in plants of the Musaceae family, in particular of the genus Musa.

In one embodiment the use of Fluopyram for controlling Fusarium wilt in plants of the Musaceae family, in particular of the genus Musa is disclosed.

In one embodiment the use of Fluopyram for controlling Fusarium wilt in cultivated banana plants is disclosed.

In one embodiment the use of Bacillus subtilis, in particular strain QST 713 for controlling Fusarium wilt in plants of the Musaceae family, in particular of the genus Musa is disclosed.

In one embodiment the use of Bacillus subtilis, in particular strain QST 713 for controlling Fusarium wilt in cultivated banana plants is disclosed.

In one embodiment the use of Bacillus subtilis strain QST 713 for controlling Fusarium wilt in plants of the Musaceae family, in particular of the genus Musa is disclosed.

In one embodiment the use of Bacillus subtilis strain QST 713 for controlling Fusarium wilt in cultivated banana plants is disclosed.

In another embodiment the use of compositions comprising Fluopyram and/or Bacillus subtilis, in particular strain QST 713 for controlling Fusarium wilt in plants of the Musaceae family is disclosed.

In another embodiment the use of compositions comprising Fluopyram and/or Bacillus subtilis, in particular strain QST 713 for controlling Fusarium wilt in cultivated banana plants is disclosed.

In another embodiment the use of compositions comprising Fluopyram for controlling Fusarium wilt in plants of the Musaceae family is disclosed.

In another embodiment the use of compositions comprising Fluopyram for controlling Fusarium wilt in cultivated banana plants is disclosed.

In another embodiment the use of compositions comprising Bacillus subtilis, in particular strain QST 713 for controlling Fusarium wilt in plants of the Musaceae family is disclosed.

In another embodiment the use of compositions comprising Bacillus subtilis, in particular strain QST 713 for controlling Fusarium wilt in cultivated banana plants is disclosed.

In another embodiment the use of compositions comprising Bacillus subtilis strain QST 713 for controlling Fusarium wilt in plants of the Musaceae family is disclosed.

In another embodiment the use of compositions comprising Bacillus subtilis strain QST 713 for controlling Fusarium wilt in cultivated banana plants is disclosed.

In another embodiment the use of compositions comprising

A) Fluopyram and/or Bacillus subtilis, in particular strain QST 713

B) at least further one agrochemically active compound and/or

for controlling Fusarium wilt in plants of the Musaceae family, in particular of the genus Musa is disclosed.

In another embodiment the use of compositions comprising

A) Fluopyram and/or Bacillus subtilis, in particular strain QST 713

B) at least further one agrochemically active compound and/or

for controlling Fusarium wilt in cultivated banana plants is disclosed.

In another embodiment the use of compositions comprising

A) Fluopyram

B) at least further one agrochemically active compound and/or

for controlling Fusarium wilt in plants of the Musaceae family, in particular of the genus Musa is disclosed.

In another embodiment the use of compositions comprising

A) Fluopyram

B) at least further one agrochemically active compound and/or

for controlling Fusarium wilt in cultivated banana plants is disclosed.

In another embodiment the use of compositions comprising

A) Bacillus subtilis, in particular strain QST 713

B) at least further one agrochemically active compound and/or

for controlling Fusarium wilt in plants of the Musaceae family, in particular of the genus Musa is disclosed.

In another embodiment the use of compositions comprising

A) Bacillus subtilis, in particular strain QST 713

B) at least further one agrochemically active compound and/or

for controlling Fusarium wilt in cultivated banana plants is disclosed.

In another embodiment the use of compositions comprising

A) Bacillus subtilis strain QST 713

B) at least further one agrochemically active compound and/or

for controlling Fusarium wilt in plants of the Musaceae family, in particular of the genus Musa is disclosed.

In another embodiment the use of compositions comprising

A) Bacillus subtilis strain QST 713

B) at least further one agrochemically active compound and/or

for controlling Fusarium wilt in cultivated banana plants is disclosed.

An exemplary method of the invention comprises applying Fluopyram and/or Bacillus subtilis, in particular strain QST 713 in plants of the Musaceae family, in particular of the genus Musa of the invention to either soil or a plant to control Fusarium wilt.

The Musaceae family consists, inter alia, of the following species: Musa acuminata, Musa balbisiana, Musa acuminata Colla with the varieties "Dwarf Cavendish", "Giant Cavendish" and "Gros Michel", Musa cavendishii Lamb. ex Paxt., Musa malaccensis Ridl., Musa angcorensis Gagnep., Musa aurantiaca, Musa balbisiana, Musa seminifera Lour., Musa banksii F. Muell., Musa basjoo, Musa cheesmanii, Musa flaviflora Simmonds, Musa griersonii, Musa itinerans, Musa laterita, Musa mannii, Musa nagensium, Musa ochracea, Musa ornata Roxb., Musa siamea, Musa sikkimensis, Musa thomsonii Noltie, Musa velutina Wendl. & Drude, Musa alinsanaya, Musa beccarii, Musa boman, Musa borneënsis, Musa bukensis, Musa campestris, Musa coccinea Andrews, Musa uranoscopos Lour, Musa exotica Valmayor, Musa fitzalanii, Musa flavida, Musa gracilis, Musa hirta Becc., Musa insularimontana Hayata, Musa jackeyi, Musa johnsii, Musa lawitiensis, Musa lolodensis, Musa maclayi, Musa monticola, Musa muluensis, Musa paracoccinea, Musa peekelii, Musa pigmaea Hotta, Musa rubra, Musa salaccensis, Musa splendida A. Chev., Musa suratii, Musa textilis: Abacá, Japanese hardy or fibre banana, Musa troglodytarum, Musa tuberculata, Musa violascens, Musa ingens, Musa paradisiaca sapientm, Musa paradisiaca normali, and crosses of these species.

Preferred is the group of cultivated bananas comprising the species Musa acuminata Colla and Musa balbisiana Colla (ancestral species) and Musa × paradisiaca L. (hybrid M. acuminata × M. balbisiana).

In accordance with the invention, all plants of the Musaceae family may be treated. Plants of the Musaceae family are, in the present context, understood as meaning all plant parts and plant populations, such as desired and undesired wild plants or crop plants (including naturally occurring crop plants). Crop plants may be plants of the Musaceae family which can be obtained by traditional breeding and optimization methods or else by biotechnological and recombinant methods, or combinations of these methods, including the transgenic plants of the Musaceae family and including the plant varieties capable or not of being protected by Plant Breeders' Rights, such as, for example, Gros Michel, Cavendish, Dwarf Cavendish, Dwarf Chinese, Enano, Caturra, Giant Cavendish, Gran Enano, Grande Naine, Williams Hybrid, Valery, Robusta, Poyo, Lacatan, Pisang masak hijau, Monte cristo, Bout rond.

Plant parts are intended to mean all aerial and subterranean parts and organs of the plants, such as herb, pseudostem, shoot, leaf, bract, leaf sheaths, petiole, lamina, flower and root, examples

which may be mentioned being leaves, needles, stalks, stems, flowers, petioles, fruiting bodies, fruit, banana hand, bunches and seeds, and also roots, tubers, rhizomes, offshoots, suckers, secondary growth. The plant parts also include crop material and vegetative and generative propagation material, for example cuttings, tubers, rhizomes, slips and seeds.

As has already been mentioned above, all plants of the Musaceae family can be treated in accordance with the invention. In a preferred embodiment, plant species and plant varieties, and their parts, which are found in the wild or which are obtained by conventional biological breeding methods, such as hybridization, meristem cultures, micropropagation, somatic embryogenesis, direct organogenesis or protoplast fusion, are treated. In a further preferred embodiment, transgenic plants of the Musaceae family and plant varieties of the Musaceae family which have been obtained by recombinant methods, if appropriate in combination with traditional methods (genetically modified organisms), are treated, such as, for example, transformation by means of Agrobacterium or particle bombardment of embryogenic cells, and micropropagation. Plants of the Musaceae family include all plant parts as mentioned below.

It is especially preferred to treat, in accordance with the invention, plants of the Musaceae family of those plant varieties which are in each case commercially available or in use. Plant varieties are understood as meaning plants with new properties ("traits") which have been obtained by conventional breeding, by mutagenesis or else by recombinant DNA techniques. They may be varieties, breeds, biotypes and genotypes. Traits might include for example include herbicide or insect tolerance, tolerance to draught, heat or cold.

All plants and plant parts can be treated in accordance with the invention. Plants are understood here to mean all plants and plant populations, such as desired and undesired wild plants or crop plants (including naturally occurring crop plants). Crop plants may be plants which can be obtained by conventional breeding and optimization methods or by biotechnological and genetic engineering methods or combinations of these methods, including the transgenic plants and including the plant cultivars which are protectable and non-protectable by plant breeders' rights. Plant parts are understood to mean all parts and organs of plants above and below the ground, such as shoot, leaf, flower and root, examples of which include leaves, needles, stalks, stems, flowers, fruit bodies, fruits and seeds, and also roots, tubers and rhizomes. The plant parts also include harvested material and vegetative and generative propagation material, for example cuttings, tubers, rhizomes, slips and seeds.

Mixing Partners

One embodiment relates to the use of a composition comprising A) Fluopyram and/or Bacillus subtilis, in particular strain QST 713 or a mixture of the Fluopyram and/or Bacillus subtilis, in particular strain QST 713 and B) at least one further agrochemically active compound and/or at least one biological control agent.

In another embodiment, the present invention relates to the use of a composition comprising A) Fluopyram and/or Bacillus subtilis, in particular strain QST 713 or a mixture of Fluopyram and/or Bacillus subtilis, in particular strain QST 713 and B) at least one further agrochemically active compound.

The agrochemically active compound described under B) are the following active ingredients

being fungicides which may be mentioned are:

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

2) Inhibitors of the respiratory chain at complex I or II, for example (2.1) bixafen, (2.2) boscalid, (2.3) carboxin, (2.4) diflumetorim, (2.5) fenfuram, (2.6) fluopyram, (2.7) flutolanil, (2.8) fluxapyroxad, (2.9) furametpyr, (2.10) furmecyclox, (2.11) isopyrazam (mixture of syn-epimeric racemate 1RS,4SR,9RS and anti-epimeric racemate 1RS,4SR,9SR), (2.12) isopyrazam (anti-epimeric racemate 1RS,4SR,9SR), (2.13) isopyrazam (anti-epimeric enantiomer 1R,4S,9S), (2.14) isopyrazam (anti-epimeric enantiomer 1S,4R,9R), (2.15) isopyrazam (syn epimeric racemate 1RS,4SR,9RS), (2.16) isopyrazam (syn-epimeric

enantiomer 1R,4S,9R), (2.17) isopyrazam (syn-epimeric enantiomer 1S,4R,9S), (2.18) mepronil, (2.19) oxycarboxin, (2.20) penflufen, (2.21) penthiopyrad, (2.22) sedaxane, (2.23) thifluzamide, (2.24) 1-methyl-N-[2-(1,1,2,2-tetrafluoroethoxy)phenyl]-3-(trifluoromethyl)-1H-pyrazole-4-carboxamide, (2.25) 3-(difluoromethyl)-1-methyl-N-[2-(1,1,2,2-tetrafluoroethoxy)phenyl]-1H-pyrazole-4-carboxamide, (2.26) 3-(difluoromethyl)-N-[4-fluoro-2-(1,1,2,3,3,3-hexafluoropropoxy)phenyl]-1-methyl-1H-pyrazole-4-carboxamide, (2.27) N-[1-(2,4-dichlorophenyl)-1-methoxypropan-2-yl]-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide, (2.28) 5,8-difluoro-N-[2-(2-fluoro-4-{[4-(trifluoromethyl)pyridin-2-yl]oxy}phenyl)ethyl]quinazolin-4-amine, (2.29) benzovindiflupyr, (2.30) N-[(1S,4R)-9-(dichloromethylene)-1,2,3,4-tetrahydro-1,4-methanonaphthalen-5-yl]-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide, (2.31) N-[(1R,4S)-9-(dichloromethylene)-1,2,3,4-tetrahydro-1,4-methanonaphthalen-5-yl]-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide, (2.32) 3-(difluoromethyl)-1-methyl-N-(1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl)-1H-pyrazole-4-carboxamide, (2.33) 1,3,5-trimethyl-N-(1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl)-1H-pyrazole-4-carboxamide, (2.34) 1-methyl-3-(trifluoromethyl)-N-(1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl)-1H-pyrazole-4-carboxamide, (2.35) 1-methyl-3-(trifluoromethyl)-N-[(3R)-1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl]-1H-pyrazole-4-carboxamide, (2.36) 1-methyl-3-(trifluoromethyl)-N-[(3S)-1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl]-1H-pyrazole-4-carboxamide, (2.37) 3-(difluoromethyl)-1-methyl-N-[(3S)-1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl]-1H-pyrazole-4-carboxamide, (2.38) 3-(difluoromethyl)-1-methyl-N-[(3R)-1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl]-1H-pyrazole-4-carboxamide, (2.39) 1,3,5-trimethyl-N-[(3R)-1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl]-1H-pyrazole-4-carboxamide, (2.40) 1,3,5-trimethyl-N-[(3S)-1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl]-1H-pyrazole-4-carboxamide, (2.41) benodanil, (2.42) 2-chloro-N-(1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl)pyridine-3-carboxamide, (2.43) N-[1-(4-isopropoxy-2-methylphenyl)-2-methyl-1-oxopropan-2-yl]-3-methylthiophene-2-carboxamide.

3) Inhibitors of the respiratory chain at complex III, for example (3.1) ametoctradin, (3.2) amisulbrom, (3.3) azoxystrobin, (3.4) cyazofamid, (3.5) coumethoxystrobin, (3.6) coumoxystrobin, (3.7) dimoxystrobin, (3.8) enoxastrobin, (3.9) famoxadone, (3.10) fenamidone, (3.11) flufenoxystrobin, (3.12) fluoxastrobin, (3.13) kresoxim-methyl, (3.14) metominostrobin, (3.15) orysastrobin, (3.16) picoxystrobin, (3.17) pyraclostrobin, (3.18) pyrametostrobin, (3.19) pyraoxystrobin, (3.20) pyribencarb, (3.21) triclopyricarb, (3.22) trifloxystrobin, (3.23) (2E)-2-(2-{[6-(3-chloro-2-methylphenoxy)-5-fluoropyrimidin-4-yl]oxy}phenyl)-2-(methoxyimino)-N-methylacetamide, (3.24) (2E)-2-(methoxyimino)-N-methyl-2-(2-{[({(1E)-1-[3-(trifluoromethyl)phenyl]ethylidene}amino)oxy]methyl}phenyl)acetamide, (3.25) (2E)-2-(methoxyimino)-N-methyl-2-{2-[(E)-({1-[3-(trifluoromethyl)phenyl]ethoxy}imino)methyl]phenyl}acetamide, (3.26) (2E)-2-{2-[({[(1E)-1-(3-{[(E)-1-fluoro-2-phenylvinyl]oxy}phenyl)ethylidene]amino}oxy)methyl]phenyl}-2-(methoxyimino)-N-methylacetamide, (3.27) Fenaminostrobin, (3.28) 5-methoxy-2-methyl-4-(2-{[({(1E)-1-[3-

(trifluoromethyl)phenyl]ethylidene}amino)oxy]methyl}phenyl)-2,4-dihydro-3H-1,2,4-triazol-3-one, (3.29) methyl (2E)-2-{2-[({cyclopropyl[(4-methoxyphenyl)imino]methyl}sulfanyl)methyl]phenyl}-3-methoxyacrylate, (3.30) N-(3-ethyl-3,5,5-trimethylcyclohexyl)-3-formamido-2-hydroxybenzamide, (3.31) 2-{2-[(2,5-dimethylphenoxy)methyl]phenyl}-2-methoxy-N-methylacetamide, (3.32) 2-{2-[(2,5-dimethylphenoxy)methyl]phenyl}-2-methoxy-N-methylacetamide.

4) Inhibitors of the mitosis and cell division, for example (4.1) benomyl, (4.2) carbendazim, (4.3) chlorfenazole, (4.4) diethofencarb, (4.5) ethaboxam, (4.6) fluopicolide, (4.7) fuberidazole, (4.8) pencycuron, (4.9) thiabendazole, (4.10) thiophanate-methyl, (4.11) thiophanate, (4.12) zoxamide, (4.13) 5-chloro-7-(4-methylpiperidin-1-yl)-6-(2,4,6-trifluorophenyl)[1,2,4]triazolo[1,5-a]pyrimidine, (4.14) 3-chloro-5-(6-chloropyridin-3-yl)-6-methyl-4-(2,4,6-trifluorophenyl)pyridazine.

5) Compounds capable to have a multisite action, for example (5.1) bordeaux mixture, (5.2) captafol, (5.3) captan, (5.4) chlorothalonil, (5.5) copper hydroxide, (5.6) copper naphthenate, (5.7) copper oxide, (5.8) copper oxychloride, (5.9) copper(2+) sulfate, (5.10) dichlofluanid, (5.11) dithianon, (5.12) dodine, (5.13) dodine free base, (5.14) ferbam, (5.15) fluorofolpet, (5.16) folpet, (5.17) guazatine, (5.18) guazatine acetate, (5.19) iminoctadine, (5.20) iminoctadine albesilate, (5.21) iminoctadine triacetate, (5.22) mancopper, (5.23) mancozeb, (5.24) maneb, (5.25) metiram, (5.26) metiram zinc, (5.27) oxine-copper, (5.28) propamidine, (5.29) propineb, (5.30) sulfur and sulfur preparations including calcium polysulfide, (5.31) thiram, (5.32) tolylfluanid, (5.33) zineb, (5.34) ziram, (5.35) anilazine.

6) Compounds capable to induce a host defence, for example (6.1) acibenzolar-S-methyl, (6.2) isotianil, (6.3) probenazole, (6.4) tiadinil, (6.5) laminarin.

7) Inhibitors of the amino acid and/or protein biosynthesis, for example (7.1) andoprim, (7.2) blasticidin-S, (7.3) cyprodinil, (7.4) kasugamycin, (7.5) kasugamycin hydrochloride hydrate, (7.6) mepanipyrim, (7.7) pyrimethanil, (7.8) 3-(5-fluoro-3,3,4,4-tetramethyl-3,4-dihydroisoquinolin-1-yl)quinoline, (7.9) oxytetracycline, (7.10) streptomycin.

8) Inhibitors of the ATP production, for example (8.1) fentin acetate, (8.2) fentin chloride, (8.3) fentin hydroxide, (8.4) silthiofam.

9) Inhibitors of the cell wall synthesis, for example (9.1) benthiavalicarb, (9.2) dimethomorph, (9.3) flumorph, (9.4) iprovalicarb, (9.5) mandipropamid, (9.6) polyoxins, (9.7) polyoxorim, (9.8) validamycin A, (9.9) valifenalate, (9.10) polyoxin B.

10) Inhibitors of the lipid and membrane synthesis, for example (10.1) biphenyl, (10.2) chloroneb, (10.3) dicloran, (10.4) edifenphos, (10.5) etridiazole, (10.6) iodocarb, (10.7) iprobenfos, (10.8) isoprothiolane, (10.9) propamocarb, (10.10) propamocarb hydrochloride, (10.11) prothiocarb, (10.12) pyrazophos, (10.13) quintozene, (10.14) tecnazene, (10.15) tolclofos-methyl.

11) Inhibitors of the melanin biosynthesis, for example (11.1) carpropamid, (11.2) diclocymet, (11.3) fenoxanil, (11.4) phthalide, (11.5) pyroquilon, (11.6) tricyclazole, (11.7) 2,2,2-trifluoroethyl {3-methyl-1-[(4-methylbenzoyl)amino]butan-2-yl}carbamate.

12) Inhibitors of the nucleic acid synthesis, for example (12.1) benalaxyl, (12.2) benalaxyl-M (kiralaxyl), (12.3) bupirimate, (12.4) clozylacon, (12.5) dimethirimol, (12.6) ethirimol, (12.7) furalaxyl, (12.8) hymexazol, (12.9) metalaxyl, (12.10) metalaxyl-M (mefenoxam), (12.11) ofurace, (12.12) oxadixyl, (12.13) oxolinic acid, (12.14) octhilinone.

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

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

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

(trifluoromethyl)-1H-pyrazol-1-yl]-1-(4-{4-[(5R)-5-phenyl-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)ethanone, (15.63) 2-[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]-1-(4-{4-[(5S)-5-phenyl-4,5-dihydro-1,2-oxazol-3-yl]-1,3-thiazol-2-yl}piperidin-1-yl)ethanone, (15.64) 2-[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]-1-{4-[4-(5-phenyl-4,5-dihydro-1,2-oxazol-3-yl)-1,3-thiazol-2-yl]piperidin-1-yl}ethanone, (15.65) 2-butoxy-6-iodo-3-propyl-4H-chromen-4-one, (15.66) 2-chloro-5-[2-chloro-1-(2,6-difluoro-4-methoxyphenyl)-4-methyl-1H-imidazol-5-yl]pyridine, (15.67) 2-phenylphenol and salts, (15.68) 3-(4,4,5-trifluoro-3,3-dimethyl-3,4-dihydroisoquinolin-1-yl)quinoline, (15.69) 3,4,5-trichloropyridine-2,6-dicarbonitrile, (15.70) 3-chloro-5-(4-chlorophenyl)-4-(2,6-difluorophenyl)-6-methylpyridazine, (15.71) 4-(4-chlorophenyl)-5-(2,6-difluorophenyl)-3,6-dimethylpyridazine, (15.72) 5-amino-1,3,4-thiadiazole-2-thiol, (15.73) 5-chloro-N'-phenyl-N'-(prop-2-yn-1-yl)thiophene-2-sulfonohydrazide, (15.74) 5-fluoro-2-[(4-fluorobenzyl)oxy]pyrimidin-4-amine, (15.75) 5-fluoro-2-[(4-methylbenzyl)oxy]pyrimidin-4-amine, (15.76) 5-methyl-6-octyl[1,2,4]triazolo[1,5-a]pyrimidin-7-amine, (15.77) ethyl (2Z)-3-amino-2-cyano-3-phenylacrylate, (15.78) N'-(4-{[3-(4-chlorobenzyl)-1,2,4-thiadiazol-5-yl]oxy}-2,5-dimethylphenyl)-N-ethyl-N-methylimidoformamide, (15.79) N-(4-chlorobenzyl)-3-[3-methoxy-4-(prop-2-yn-1-yloxy)phenyl]propanamide, (15.80) N-[(4-chlorophenyl)(cyano)methyl]-3-[3-methoxy-4-(prop-2-yn-1-yloxy)phenyl]propanamide, (15.81) N-[(5-bromo-3-chloropyridin-2-yl)methyl]-2,4-dichloronicotinamide, (15.82) N-[1-(5-bromo-3-chloropyridin-2-yl)ethyl]-2,4-dichloronicotinamide, (15.83) N-[1-(5-bromo-3-chloropyridin-2-yl)ethyl]-2-fluoro-4-iodonicotinamide, (15.84) N-{(E)-[(cyclopropylmethoxy)imino][6-(difluoromethoxy)-2,3-difluorophenyl]methyl}-2-phenylacetamide, (15.85) N-{(Z)-[(cyclopropylmethoxy)imino][6-(difluoromethoxy)-2,3-difluorophenyl]methyl}-2-phenylacetamide, (15.86) N'-{4-[(3-tert-butyl-4-cyano-1,2-thiazol-5-yl)oxy]-2-chloro-5-methylphenyl}-N-ethyl-N-methylimidoformamide, (15.87) N-methyl-2-(1-{[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]acetyl}piperidin-4-yl)-N-(1,2,3,4-tetrahydronaphthalen-1-yl)-1,3-thiazole-4-carboxamide, (15.88) N-methyl-2-(1-{[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]acetyl}piperidin-4-yl)-N-[(1R)-1,2,3,4-tetrahydronaphthalen-1-yl]-1,3-thiazole-4-carboxamide, (15.89) N-methyl-2-(1-{[5-methyl-3-(trifluoromethyl)-1H-pyrazol-1-yl]acetyl}piperidin-4-yl)-N-[(1S)-1,2,3,4-tetrahydronaphthalen-1-yl]-1,3-thiazole-4-carboxamide, (15.90) pentyl {6-[({[(1-methyl-1H-tetrazol-5-yl)(phenyl)methylene]amino}oxy)methyl]pyridin-2-yl}carbamate, (15.91) phenazine-1-carboxylic acid, (15.92) quinolin-8-ol, (15.93) quinolin-8-ol sulfate (2:1), (15.94) tert-butyl {6-[({[(1-methyl-1H-tetrazol-5-yl)(phenyl)methylene]amino}oxy)methyl]pyridin-2-yl}carbamate, (15.95) 1-methyl-3-(trifluoromethyl)-N-[2'-(trifluoromethyl)biphenyl-2-yl]-1H-pyrazole-4-carboxamide, (15.96) N-(4'-chlorobiphenyl-2-yl)-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide, (15.97) N-(2',4'-dichlorobiphenyl-2-yl)-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide, (15.98) 3-(difluoromethyl)-1-methyl-N-[4'-(trifluoromethyl)biphenyl-2-yl]-1H-pyrazole-4-carboxamide, (15.99) N-(2',5'-difluorobiphenyl-2-yl)-1-methyl-3-(trifluoromethyl)-1H-pyrazole-4-carboxamide, (15.100) 3-(difluoromethyl)-1-methyl-N-[4'-(prop-1-yn-1-yl)biphenyl-2-yl]-1H-pyrazole-4-carboxamide, (15.101) 5-fluoro-1,3-dimethyl-N-[4'-(prop-1-yn-1-yl)biphenyl-2-yl]-1H-pyrazole-4-carboxamide, (15.102) 2-

chloro-N-[4'-(prop-1-yn-1-yl)biphenyl-2-yl]nicotinamide, (15.103) 3-(difluoromethyl)-N-[4'-(3,3-dimethylbut-1-yn-1-yl)biphenyl-2-yl]-1-methyl-1H-pyrazole-4-carboxamide, (15.104) N-[4'-(3,3-dimethylbut-1-yn-1-yl)biphenyl-2-yl]-5-fluoro-1,3-dimethyl-1H-pyrazole-4-carboxamide, (15.105) 3-(difluoromethyl)-N-(4'-ethynylbiphenyl-2-yl)-1-methyl-1H-pyrazole-4-carboxamide, (15.106) N-(4'-ethynylbiphenyl-2-yl)-5-fluoro-1,3-dimethyl-1H-pyrazole-4-carboxamide, (15.107) 2-chloro-N-(4'-ethynylbiphenyl-2-yl)nicotinamide, (15.108) 2-chloro-N-[4'-(3,3-dimethylbut-1-yn-1-yl)biphenyl-2-yl]nicotinamide, (15.109) 4-(difluoromethyl)-2-methyl-N-[4'-(trifluoromethyl)biphenyl-2-yl]-1,3-thiazole-5-carboxamide, (15.110) 5-fluoro-N-[4'-(3-hydroxy-3-methylbut-1-yn-1-yl)biphenyl-2-yl]-1,3-dimethyl-1H-pyrazole-4-carboxamide, (15.111) 2-chloro-N-[4'-(3-hydroxy-3-methylbut-1-yn-1-yl)biphenyl-2-yl]nicotinamide, (15.112) 3-(difluoromethyl)-N-[4'-(3-methoxy-3-methylbut-1-yn-1-yl)biphenyl-2-yl]-1-methyl-1H-pyrazole-4-carboxamide, (15.113) 5-fluoro-N-[4'-(3-methoxy-3-methylbut-1-yn-1-yl)biphenyl-2-yl]-1,3-dimethyl-1H-pyrazole-4-carboxamide, (15.114) 2-chloro-N-[4'-(3-methoxy-3-methylbut-1-yn-1-yl)biphenyl-2-yl]nicotinamide, (15.115) (5-bromo-2-methoxy-4-methylpyridin-3-yl)(2,3,4-trimethoxy-6-methylphenyl)methanone, (15.116) N-[2-(4-{[3-(4-chlorophenyl)prop-2-yn-1-yl]oxy}-3-methoxyphenyl)ethyl]-N2-(methylsulfonyl)valinamide, (15.117) 4-oxo-4-[(2-phenylethyl)amino]butanoic acid, (15.118) but-3-yn-1-yl {6-[({[(Z)-(1-methyl-1H-tetrazol-5-yl)(phenyl)methylene]amino}oxy)methyl]pyridin-2-yl}carbamate, (15.119) 4-amino-5-fluoropyrimidin-2-ol (mesomeric form: 4-amino-5-fluoropyrimidin-2(1H)-one), (15.120) propyl 3,4,5-trihydroxybenzoate, (15.121) 1,3-dimethyl-N-(1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl)-1H-pyrazole-4-carboxamide, (15.122) 1,3-dimethyl-N-[(3R)-1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl]-1H-pyrazole-4-carboxamide, (15.123) 1,3-dimethyl-N-[(3S)-1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl]-1H-pyrazole-4-carboxamide, (15.124) [3-(4-chloro-2-fluorophenyl)-5-(2,4-difluorophenyl)-1,2-oxazol-4-yl](pyridin-3-yl)methanol, (15.125) (S)-[3-(4-chloro-2-fluorophenyl)-5-(2,4-difluorophenyl)-1,2-oxazol-4-yl](pyridin-3-yl)methanol, (15.126) (R)-[3-(4-chloro-2-fluorophenyl)-5-(2,4-difluorophenyl)-1,2-oxazol-4-yl](pyridin-3-yl)methanol, (15.127) 2-{[3-(2-chlorophenyl)-2-(2,4-difluorophenyl)oxiran-2-yl]methyl}-2,4-dihydro-3H-1,2,4-triazole-3-thione, (15.128) 1-{[3-(2-chlorophenyl)-2-(2,4-difluorophenyl)oxiran-2-yl]methyl}-1H-1,2,4-triazol-5-yl thiocyanate, (15.129) 5-(allylsulfanyl)-1-{[3-(2-chlorophenyl)-2-(2,4-difluorophenyl)oxiran-2-yl]methyl}-1H-1,2,4-triazole, (15.130) 2-[1-(2,4-dichlorophenyl)-5-hydroxy-2,6,6-trimethylheptan-4-yl]-2,4-dihydro-3H-1,2,4-triazole-3-thione, (15.131) 2-{[rel(2R,3S)-3-(2-chlorophenyl)-2-(2,4-difluorophenyl)oxiran-2-yl]methyl}-2,4-dihydro-3H-1,2,4-triazole-3-thione, (15.132) 2-{[rel(2R,3R)-3-(2-chlorophenyl)-2-(2,4-difluorophenyl)oxiran-2-yl]methyl}-2,4-dihydro-3H-1,2,4-triazole-3-thione, (15.133) 1-{[rel(2R,3S)-3-(2-chlorophenyl)-2-(2,4-difluorophenyl)oxiran-2-yl]methyl}-1H-1,2,4-triazol-5-yl thiocyanate, (15.134) 1-{[rel(2R,3R)-3-(2-chlorophenyl)-2-(2,4-difluorophenyl)oxiran-2-yl]methyl}-1H-1,2,4-triazol-5-yl thiocyanate, (15.135) 5-(allylsulfanyl)-1-{[rel(2R,3S)-3-(2-chlorophenyl)-2-(2,4-difluorophenyl)oxiran-2-yl]methyl}-1H-1,2,4-triazole, (15.136) 5-(allylsulfanyl)-1-{[rel(2R,3R)-3-(2-chlorophenyl)-2-(2,4-difluorophenyl)oxiran-2-yl]methyl}-1H-1,2,4-triazole, (15.137) 2-[(2S,4S,5S)-1-(2,4-dichlorophenyl)-5-hydroxy-2,6,6-trimethylheptan-4-yl]-2,4-dihydro-3H-1,2,4-triazole-3-thione, (15.138) 2-[(2R,4S,5S)-1-(2,4-

dichlorophenyl)-5-hydroxy-2,6,6-trimethylheptan-4-yl]-2,4-dihydro-3H-1,2,4-triazole-3-thione, (15.139) 2-[(2R,4R,5R)-1-(2,4-dichlorophenyl)-5-hydroxy-2,6,6-trimethylheptan-4-yl]-2,4-dihydro-3H-1,2,4-triazole-3-thione, (15.140) 2-[(2S,4R,5R)-1-(2,4-dichlorophenyl)-5-hydroxy-2,6,6-trimethylheptan-4-yl]-2,4-dihydro-3H-1,2,4-triazole-3-thione, (15.141) 2-[(2S,4S,5R)-1-(2,4-dichlorophenyl)-5-hydroxy-2,6,6-trimethylheptan-4-yl]-2,4-dihydro-3H-1,2,4-triazole-3-thione, (15.142) 2-[(2R,4S,5R)-1-(2,4-dichlorophenyl)-5-hydroxy-2,6,6-trimethylheptan-4-yl]-2,4-dihydro-3H-1,2,4-triazole-3-thione, (15.143) 2-[(2R,4R,5S)-1-(2,4-dichlorophenyl)-5-hydroxy-2,6,6-trimethylheptan-4-yl]-2,4-dihydro-3H-1,2,4-triazole-3-thione, (15.144) 2-[(2S,4R,5S)-1-(2,4-dichlorophenyl)-5-hydroxy-2,6,6-trimethylheptan-4-yl]-2,4-dihydro-3H-1,2,4-triazole-3-thione, (15.145) 2-fluoro-6-(trifluoromethyl)-N-(1,1,3-trimethyl-2,3-dihydro-1H-inden-4-yl)benzamide, (15.146) 2-(6-benzylpyridin-2-yl)quinazoline, (15.147) 2-[6-(3-fluoro-4-methoxyphenyl)-5-methylpyridin-2-yl]quinazoline, (15.148) 3-(4,4-difluoro-3,3-dimethyl-3,4-dihydroisoquinolin-1-yl)quinoline, (15.149) Abscisic acid.

All named mixing partners of the classes (1) to (15) can, if their functional groups enable this, optionally form salts with suitable bases or acids.

Wherein all named mixing partners of the classes (1) to (15) can, if their functional groups enable this, optionally form salts with suitable bases or acids;

Preferred fungicides are selected from the group comprising Fosetyl-Al.

Being bactericides which may be mentioned are:

bronopol, dichlorophen, nitrapyrin, nickel dimethyldithiocarbamate, kasugamycin, octhilinone, furancarboxylic acid, oxytetracycline, probenazole, streptomycin, tecloftalam, copper sulphate and other copper preparations.

being insecticides, acaricides and nematicides which may be mentioned are:

((1) Acetylcholinesterase (AChE) inhibitors, for example

carbamates, e.g. Alanycarb, Aldicarb, Bendiocarb, Benfuracarb, Butocarboxim, Butoxycarboxim, Carbaryl, Carbofuran, Carbosulfan, Ethiofencarb, Fenobucarb, Formetanate, Furathiocarb, Isoprocarb, Methiocarb, Methomyl, Metolcarb, Oxamyl, Pirimicarb, Propoxur, Thiodicarb, Thiofanox, Triazamate, Trimethacarb, XMC, and Xylylcarb; or

organophosphates, e.g. Acephate, Azamethiphos, Azinphos-ethyl, Azinphos-methyl, Cadusafos, Chlorethoxyfos, Chlorfenvinphos, Chlormephos, Chlorpyrifos, Chlorpyrifos-methyl, Coumaphos, Cyanophos, Demeton-S-methyl, Diazinon, Dichlorvos/DDVP, Dicrotophos, Dimethoate, Dimethylvinphos, Disulfoton, EPN, Ethion, Ethoprophos, Famphur, Fenamiphos, Fenitrothion, Fenthion, Fosthiazate, Heptenophos, Imicyafos, Isofenphos, Isopropyl O-(methoxyaminothio-phosphoryl) salicylate, Isoxathion, Malathion, Mecarbam, Methamidophos, Methidathion, Mevinphos,

Monocrotophos, Naled, Omethoate, Oxydemeton-methyl, Parathion, Parathion-methyl, Phenthoate, Phorate, Phosalone, Phosmet, Phosphamidon, Phoxim, Pirimiphos-methyl, Profenofos, Propetamphos, Prothiofos, Pyraclofos, Pyridaphenthion, Quinalphos, Sulfotep, Tebupirimfos, Temephos, Terbufos, Tetrachlorvinphos, Thiometon, Triazophos, Trichlorfon, and Vamidothion.

(2) GABA-gated chloride channel antagonists, for example

cyclodiene organochlorines, e.g. Chlordane and Endosulfan; or

phenylpyrazoles (fiproles), e.g. Ethiprole and Fipronil.

(3) Sodium channel modulators / voltage-dependent sodium channel blockers, for example

pyrethroids, e.g. Acrinathrin, Allethrin, d-cis-trans Allethrin, d-trans Allethrin, Bifenthrin, Bioallethrin, Bioallethrin S-cyclopentenyl isomer, Bioresmethrin, Cycloprothrin, Cyfluthrin, beta-Cyfluthrin, Cyhalothrin, lambda-Cyhalothrin, gamma-Cyhalothrin, Cypermethrin, alpha-Cypermethrin, beta-Cypermethrin, theta-Cypermethrin, zeta-Cypermethrin, Cyphenothrin [(1R)-trans isomers], Deltamethrin, Empenthrin [(EZ)-(1R) isomers), Esfenvalerate, Etofenprox, Fenpropathrin, Fenvalerate, Flucythrinate, Flumethrin, tau-Fluvalinate, Halfenprox, Imiprothrin, Kadethrin, Permethrin, Phenothrin [(1R)-trans isomer), Prallethrin, Pyrethrine (pyrethrum), Resmethrin, Silafluofen, Tefluthrin, Tetramethrin, Tetramethrin [(1R) isomers)], Tralomethrin, and Transfluthrin; or

DDT; or Methoxychlor.

(4) Nicotinic acetylcholine receptor (nAChR) agonists, for example

neonicotinoids, e.g. Acetamiprid, Clothianidin, Dinotefuran, Imidacloprid, Nitenpyram, Thiacloprid, and Thiamethoxam; or

Nicotine; or

Sulfoxaflor.

(5) Nicotinic acetylcholine receptor (nAChR) allosteric activators, for example

spinosyns, e.g. Spinetoram and Spinosad.

(6) Chloride channel activators, for example

avermectins/milbemycins, e.g. Abamectin, Emamectin benzoate, Lepimectin, and Milbemectin.

(7) Juvenile hormone mimics, for example

juvenile hormon analogues, e.g. Hydroprene, Kinoprene, and Methoprene; or

Fenoxycarb; or Pyriproxyfen.

(8) Miscellaneous non-specific (multi-site) inhibitors, for example

alkyl halides, e.g. Methyl bromide and other alkyl halides; or

Chloropicrin; or Sulfuryl fluoride; or Borax; or Tartar emetic.

(9) Selective homopteran feeding blockers, e.g. Pymetrozine; or Flonicamid.

(10) Mite growth inhibitors, e.g. Clofentezine, Hexythiazox, and Diflovidazin; or

Etoxazole.

(11) Microbial disruptors of insect midgut membranes, e.g. Bacillus thuringiensis subspecies israelensis, Bacillus thuringiensis subspecies aizawai, Bacillus thuringiensis subspecies kurstaki, Bacillus thuringiensis subspecies tenebrionis, and B.t. crop proteins: Cry1Ab, Cry1Ac, Cry1Fa, Cry1A.105, Cry2Ab, Vip3A, mCry3A, Cry3Ab, Cry3Bb, Cry34 Ab1/35Ab1; or

Bacillus sphaericus.

(12) Inhibitors of mitochondrial ATP synthase, for example Diafenthiuron; or

organotin miticides, e.g. Azocyclotin, Cyhexatin, and Fenbutatin oxide; or

Propargite; or Tetradifon.

(13) Uncouplers of oxidative phoshorylation via disruption of the proton gradient, for example Chlorfenapyr, DNOC, and Sulfluramid.

(14) Nicotinic acetylcholine receptor (nAChR) channel blockers, for example Bensultap, Cartap hydrochloride, Thiocyclam, and Thiosultap-sodium.

(15) Inhibitors of chitin biosynthesis, type 0, for example Bistrifluron, Chlorfluazuron, Diflubenzuron, Flucycloxuron, Flufenoxuron, Hexaflumuron, Lufenuron, Novaluron, Noviflumuron, Teflubenzuron, and Triflumuron.

(16) Inhibitors of chitin biosynthesis, type 1, for example Buprofezin.

(17) Moulting disruptors, for example Cyromazine.

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

(19) Octopamine receptor agonists, for example Amitraz.

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

(21) Mitochondrial complex I electron transport inhibitors, for example

METI acaricides, e.g. Fenazaquin, Fenpyroximate, Pyrimidifen, Pyridaben, Tebufenpyrad, and Tolfenpyrad; or

Rotenone (Derris).

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

(23) Inhibitors of acetyl CoA carboxylase, for example

tetronic and tetramic acid derivatives, e.g. Spirodiclofen, Spiromesifen, and Spirotetramat.

(24) Mitochondrial complex IV electron transport inhibitors, for example

phosphines, e.g. Aluminium phosphide, Calcium phosphide, Phosphine, and Zinc phosphide; or

Cyanide.

(25) Mitochondrial complex II electron transport inhibitors, for example beta-ketonitrile derivatives, e.g. Cyenopyrafen and Cyflumetofen.

(28) Ryanodine receptor modulators, for example

diamides, e.g. Chlorantraniliprole, Cyantraniliprole, and Flubendiamide.

Further active ingredients with unknown or uncertain mode of action, for example Amidoflumet, Azadirachtin, Benclothiaz, Benzoximate, Bifenazate, Bromopropylate, Chinomethionat, Cryolite, Dicofol, Diflovidazin, Fluensulfone, Flufenerim, Flufiprole, Fluopyram, Fufenozide, Imidaclothiz, Iprodione, Meperfluthrin, Pyridalyl, Pyrifluquinazon, Tetramethylfluthrin, and iodomethane; furthermore products based on Bacillus firmus (including but not limited to strain CNCM I-1582, such as, for example,VOTiVO™, BioNem) or one of the following known active compounds: 3-bromo-N-{2-bromo-4-chloro-6-[(1-cyclopropylethyl)carbamoyl]phenyl}-1-(3-chloropyridin-2-yl)-1H-pyrazole-5-carboxamide (known from WO2005/077934), 4-{[(6-bromopyridin-3-yl)methyl](2-fluoroethyl)amino}furan-2(5H)-one (known from WO2007/115644), 4-{[(6-fluoropyridin-3-yl)methyl](2,2-difluoroethyl)amino}furan-2(5H)-one (known from WO2007/115644), 4-{[(2-chloro-1,3-thiazol-5-yl)methyl](2-fluoroethyl)amino}furan-2(5H)-one (known from WO2007/115644), 4-{[(6-chlorpyridin-3-yl)methyl](2-fluoroethyl)amino}furan-2(5H)-one (known from WO2007/115644), Flupyradifurone, 4-{[(6-chlor-5-fluoropyridin-3-yl)methyl](methyl)amino}furan-2(5H)-one (known from WO2007/115643), 4-{[(5,6-dichloropyridin-3-yl)methyl](2-fluoroethyl)amino}furan-2(5H)-one

(known from WO2007/115646), 4-{[(6-chloro-5-fluoropyridin-3-yl)methyl](cyclopropyl)amino}furan-2(5H)-one (known from WO2007/115643), 4-{[(6-chloropyridin-3-yl)methyl](cyclopropyl)amino}furan-2(5H)-one (known from EP-A-0 539 588), 4-{[(6-chlorpyridin-3-yl)methyl](methyl)amino}furan-2(5H)-one (known from EP-A-0 539 588), {[1-(6-chloropyridin-3-yl)ethyl](methyl)oxido-λ4-sulfanylidene}cyanamide (known from WO2007/149134) and its diastereomers {[(1R)-1-(6-chloropyridin-3-yl)ethyl](methyl)oxido-λ4-sulfanylidene}cyanamide (A) and {[(1S)-1-(6-chloropyridin-3-yl)ethyl](methyl)oxido-λ4-sulfanylidene}cyanamide (B) (also known from WO2007/149134) as well as diastereomers [(R)-methyl(oxido){(1R)-1-[6-(trifluoromethyl)pyridin-3-yl]ethyl}-λ4-sulfanylidene]cyanamide (A1) and [(S)-methyl(oxido){(1S)-1-[6-(trifluoromethyl)pyridin-3-yl]ethyl}-λ4-sulfanylidene]cyanamide (A2), referred to as group of diastereomers A (known from WO2010/074747, WO2010/074751), [(R)-methyl(oxido){(1S)-1-[6-(trifluoromethyl)pyridin-3-yl]ethyl}-λ4-sulfanylidene]cyanamide (B1) and [(S)-methyl(oxido){(1R)-1-[6-(trifluoromethyl)pyridin-3-yl]ethyl}-λ4-sulfanylidene]cyanamide (B2), referred to as group of diastereomers B (also known from WO2010/074747, WO2010/074751), and 11-(4-chloro-2,6-dimethylphenyl)-12-hydroxy-1,4-dioxa-9-azadispiro[4.2.4.2]tetradec-11-en-10-one (known from WO2006/089633), 3-(4'-fluoro-2,4-dimethylbiphenyl-3-yl)-4-hydroxy-8-oxa-1-azaspiro[4.5]dec-3-en-2-one (known from WO2008/067911), 1-{2-fluoro-4-methyl-5-[(2,2,2-trifluorethyl)sulfinyl]phenyl}-3-(trifluoromethyl)-1H-1,2,4-triazol-5-amine (known from WO2006/043635), Afidopyropen (known from WO2008/066153), 2-cyano-3-(difluoromethoxy)-N,N-dimethylbenzenesulfonamide (known from WO2006/056433), 2-cyano-3-(difluoromethoxy)-N-methylbenzenesulfonamide (known from WO2006/100288), 2-cyano-3-(difluoromethoxy)-N-ethylbenzenesulfonamide (known from WO2005/035486), 4-(difluoromethoxy)-N-ethyl-N-methyl-1,2-benzothiazol-3-amine 1,1-dioxide (known from WO2007/057407), N-[1-(2,3-dimethylphenyl)-2-(3,5-dimethylphenyl)ethyl]-4,5-dihydro-1,3-thiazol-2-amine (known from WO2008/104503), {1'-[(2E)-3-(4-chlorophenyl)prop-2-en-1-yl]-5-fluorospiro[indole-3,4'-piperidin]-1(2H)-yl}(2-chloropyridin-4-yl)methanone (known from WO2003/106457), 3-(2,5-dimethylphenyl)-4-hydroxy-8-methoxy-1,8-diazaspiro[4.5]dec-3-en-2-one (known from WO2009/049851), 3-(2,5-dimethylphenyl)-8-methoxy-2-oxo-1,8-diazaspiro[4.5]dec-3-en-4-yl ethyl carbonate (known from WO2009/049851), 4-(but-2-yn-1-yloxy)-6-(3,5-dimethylpiperidin-1-yl)-5-fluoropyrimidine (known from WO2004/099160), (2,2,3,3,4,4,5,5-octafluoropentyl)(3,3,3-trifluoropropyl)malononitrile (known from WO2005/063094), (2,2,3,3,4,4,5,5-octafluoropentyl)(3,3,4,4,4-pentafluorobutyl)malononitrile (known from WO2005/063094), 8-[2-(cyclopropylmethoxy)-4-(trifluoromethyl)phenoxy]-3-[6-(trifluoromethyl)pyridazin-3-yl]-3-azabicyclo[3.2.1]octane (known from WO2007/040280), Flometoquin, PF1364 (CAS-Reg.No. 1204776-60-2) (known from JP2010/018586), 5-[5-(3,5-dichlorophenyl)-5-(trifluoromethyl)-4,5-dihydro-1,2-oxazol-3-yl]-2-(1H-1,2,4-triazol-1-yl)benzonitrile (known from WO2007/075459), 5-[5-(2-chloropyridin-4-yl)-5-(trifluoromethyl)-4,5-dihydro-1,2-oxazol-3-yl]-2-(1H-1,2,4-triazol-1-yl)benzonitrile (known from WO2007/075459), 4-[5-(3,5-dichlorophenyl)-5-(trifluoromethyl)-4,5-dihydro-1,2-oxazol-3-yl]-2-methyl-N-{2-oxo-2-[(2,2,2-trifluoroethyl)amino]ethyl}benzamide (known

from WO2005/085216), 4-{[(6-chloropyridin-3-yl)methyl](cyclopropyl)amino}-1,3-oxazol-2(5H)-one, 4-{[(6-chloropyridin-3-yl)methyl](2,2-difluoroethyl)amino}-1,3-oxazol-2(5H)-one, 4-{[(6-chloropyridin-3-yl)methyl](ethyl)amino}-1,3-oxazol-2(5H)-one, 4-{[(6-chloropyridin-3-yl)methyl](methyl)amino}-1,3-oxazol-2(5H)-one (all known from WO2010/005692), Pyflubumide (known from WO2002/096882), methyl 2-[2-({[3-bromo-1-(3-chloropyridin-2-yl)-1H-pyrazol-5-yl]carbonyl}amino)-5-chloro-3-methylbenzoyl]-2-methylhydrazinecarboxylate (known from WO2005/085216), methyl 2-[2-({[3-bromo-1-(3-chloropyridin-2-yl)-1H-pyrazol-5-yl]carbonyl}amino)-5-cyano-3-methylbenzoyl]-2-ethylhydrazinecarboxylate (known from WO2005/085216), methyl 2-[2-({[3-bromo-1-(3-chloropyridin-2-yl)-1H-pyrazol-5-yl]carbonyl}amino)-5-cyano-3-methylbenzoyl]-2-methylhydrazinecarboxylate (known from WO2005/085216), methyl 2-[3,5-dibromo-2-({[3-bromo-1-(3-chloropyridin-2-yl)-1H-pyrazol-5-yl]carbonyl}amino)benzoyl]-1,2-diethylhydrazinecarboxylate (known from WO2005/085216), methyl 2-[3,5-dibromo-2-({[3-bromo-1-(3-chloropyridin-2-yl)-1H-pyrazol-5-yl]carbonyl}amino)benzoyl]-2-ethylhydrazinecarboxylate (known from WO2005/085216), (5RS,7RS;5RS,7SR)-1-(6-chloro-3-pyridylmethyl)-1,2,3,5,6,7-hexahydro-7-methyl-8-nitro-5-propoxyimidazo[1,2-a]pyridine (known from WO2007/101369), 2-{6-[2-(5-fluoropyridin-3-yl)-1,3-thiazol-5-yl]pyridin-2-yl}pyrimidine (known from WO2010/006713), 2-{6-[2-(pyridin-3-yl)-1,3-thiazol-5-yl]pyridin-2-yl}pyrimidine (known from WO2010/006713), 1-(3-chloropyridin-2-yl)-N-[4-cyano-2-methyl-6-(methylcarbamoyl)phenyl]-3-{[5-(trifluoromethyl)-1H-tetrazol-1-yl]methyl}-1H-pyrazole-5-carboxamide (known from WO2010/069502), 1-(3-chloropyridin-2-yl)-N-[4-cyano-2-methyl-6-(methylcarbamoyl)phenyl]-3-{[5-(trifluoromethyl)-2H-tetrazol-2-yl]methyl}-1H-pyrazole-5-carboxamide (known from WO2010/069502), N-[2-(tert-butylcarbamoyl)-4-cyano-6-methylphenyl]-1-(3-chloropyridin-2-yl)-3-{[5-(trifluoromethyl)-1H-tetrazol-1-yl]methyl}-1H-pyrazole-5-carboxamide (known from WO2010/069502), N-[2-(tert-butylcarbamoyl)-4-cyano-6-methylphenyl]-1-(3-chloropyridin-2-yl)-3-{[5-(trifluoromethyl)-2H-tetrazol-2-yl]methyl}-1H-pyrazole-5-carboxamide (known from WO2010/069502), (1E)-N-[(6-chloropyridin-3-yl)methyl]-N'-cyano-N-(2,2-difluoroethyl)ethanimidamide (known from WO2008/009360), N-[2-(5-amino-1,3,4-thiadiazol-2-yl)-4-chloro-6-methylphenyl]-3-bromo-1-(3-chloropyridin-2-yl)-1H-pyrazole-5-carboxamide (known from CN102057925), methyl 2-[3,5-dibromo-2-({[3-bromo-1-(3-chloropyridin-2-yl)-1H-pyrazol-5-yl]carbonyl}amino)benzoyl]-2-ethyl-1-methylhydrazinecarboxylate (known from WO2011/049233), Heptafluthrin, Pyriminostrobin, Flufenoxystrobin, and 3-chloro-N2-(2-cyanopropan-2-yl)-N1-[4-(1,1,1,2,3,3,3-heptafluoropropan-2-yl)-2-methylphenyl]phthalamide (known from WO2012/034472), Cycloxaprid (1203791-41-6).

being molluscicides which may be mentioned are metaldehyde and methiocarb.

In a preferred embodiment the present invention relates to the use of a composition comprising A) Fluopyram and/or Bacillus subtilis, in particular strain QST 713 or a mixture Fluopyram and/or Bacillus subtilis, in particular strain QST 713 and B) one or more of the following insecticides:

Nicotinic acetylcholine receptor agonists, preferably Acetamiprid, Dinetofuran, Imidacloprid, Clothianidin, Thiacloprid, Thiamethoxam, Sulfoxaflorand Sodium channel modulators, preferably Cypermethrin, Alpha-Cypermethrin, Lambda-Cyhalothrin, Gamma-Cyhalothrin, Beta-Cyfluthrin, Cyfluthrin, Tefluthrin, Transfluthrin, Deltamethrin, Bifenthrin, Acrinathrin

Acetylcholinesterase inhibitors, preferably Chlorpyriphos, Carbofuran, Acephate, Methiocarb, Thiodicarb, Aldicarb, Profenofos, Fenamiphos, Fosthiazate, Ethoprophos, Phorate Metamoidophos.

Ryanodine receptor modulators, preferably Chorantraniliprole, Cyantraniliprole, Flubendiamide Chloride channel activator, preferably Abamectin, Emamectin –(benzoate), Milbemectin

Nicotinic acetylcholine receptor allosteric activators, preferably Spinosad, Spinetoram

GABA-gated chloride channel antagonists , preferably Fipronil and Ethiprole

Voltage-dependent sodium channel blockers, preferably Indoxacarb, Metaflumizone

Mitochondrial complex I electron transport inhibitors, preferably Tebufenpyrad, Fenpyroximate

Mitochondrial complex II electron transport inhibitors, preferably Cyenopyrafen, Cyflumentofen

Inhibitor of mitochondrial ATP synthase, preferably Diafenthiuron,

Uncoupler of oxidative phosporylation, preferably Chlofenapyr

Inhibitor of chtinbiosynthesis, preferably Lufenuron, Methoxyfenozide, Triflumuron, Buprofezin

Selective homopteran feeding blockes, preferably Pymetrozine, Flonicamid

Additional nematicides, preferably Oxamyl, Fluopyram, Fluensulfone,

Inhibitors of Acetyl CoAc carboxylase, preferably Spirotetramate, Spirodiclofen and Spiromesifen

4-[(2,2-difluoroethyl)amino]furan-2(5H)-one - 2-chloro-5-Ethylpyridin (1:1), Flupyradifurone, Pyrifluquinazon, Flomentoquin, Pyflubumide, Cycloxaprid and fumigants.

In another embodiment, the present invention relates to the use of a composition comprising A) Fluopyram and/or Bacillus subtilis, in particular strain QST 713 or a mixture Fluopyram and/or Bacillus subtilis, in particular strain QST 713 and B) at least one nematicidal biological control agent.

A further exemplary method of the invention comprises applying Fluopyram and/or Bacillus subtilis, in particular strain QST 713 or a mixture of Fluopyram and/or Bacillus subtilis, in particular strain QST 713 - or Fluopyram and/or Bacillus subtilis, in particular strain QST 713 or a mixture of Fluopyram and/or Bacillus subtilis, in particular strain QST 713 in combination with at least one

biological control agent - to either soil or a plant (e.g. foliarly) to combat nematode damage and/or increase crop yield.

Nematicidal biological control agents (e.g. as designated under B)) suitable for use in the present invention include nematophagous bacteria and nematophagous fungi.

Nematophagous bacteria useful herein include, but are not limited to, obligate parasitic bacteria, opportunistic parasitic bacteria, rhizobacteria, parasporal Cry protein-forming bacteria, endophytic bacteria and symbiotic bacteria.

In particular embodiments, the biological control agent for a mixture of Fluopyram and/or Bacillus subtilis, in particular strain QST 713 can be a bacteria species selected from *Actinomycetes* spp, *Agrobacterium* spp., *Arthrobacter* spp., *Alcaligenes* spp., *Aureobacterium* spp., *Azobacter* spp., *Bacillus* spp., for example *Bacillus agri, Bacillus aizawai, Bacillus albolactis, Bacillus amyloliquefaciens,* in particular strain IN973a or strain B3 or strain FZB42, *Bacillus cereus,* in particular strain CNCM I-1562, *Bacillus chitinosporus, Bacillus circulans, Bacillus coagulans, Bacillus endoparasiticus, Bacillus endorhythmos, Bacillus firmus*, in particular strain CNCM 1-1582 (products known as Votivo, Flocter, Bionem), *Bacillus kurstaki, Bacillus lacticola, Bacillus lactimorbus, Bacillus lactis, Bacillus laterosporus, Bacillus lentimorbus, Bacillus licheniformis, Bacillus megaterium, Bacillus medusa, Bacillus metiens, Bacillus natto, Bacillus nematocida, Bacillus nigrificans, Bacillus popillae, Bacillus pumilus*, in particular strain GB34 or strain QST2808, *Bacillus siamensis, Bacillus sphaericus, Bacillus spp., Bacillus subtilis, Bacillus* sp B16; *Bacillus thuringiensis* (including those forming Cry proteins toxic to nematodes and/or nematode larvae such as Cry5, Cry6, Cryl2, Cryl3, Cryl4 and Cry21), *Bacillus thuringiensis* israelensis; *Bacillus thuringiensis* kurstaki; *Bacillus thuringiensis* strain ATCC 55273; *Bacillus thuringiensis var aegyptii; Bacillus thuringiensis subspec aizawai* in particular strain ABTS-1857*; Bacillus thuringiensis var colmeri; Bacillus thuringiensis var darmstadiensis; Bacillus thuringiensis var dendrolimus; Bacillus thuringiensis var galleria; Bacillus thuringiensis var japonensis; Bacillus thuringiensis subspe. morrisoni; Bacillus thuringiensis var San Diego; Bacillus thuringiensis var tenebrionis,* in particular strain NB176; *Bacillus uniflagellates*, plus those listed in the category of Bacillus Genus in the "Bergey's Manual of Systematic Bacteriology, First Ed. (1986)"; *Beijerinckia* spp., *Brevibacillus* spp., for example *Brevibacillus brevis*, *Brevibacillus laterosporus*, in particular strain G4, *Burkholderia* spp., for example *Burkholderia cepacia*, *Chromobacterium* spp., *Clavibacter* spp., *Clostridium* spp., *Comomonas* spp., *Corynebacterium* spp.,for example *Corynebacterium paurometabolu*, *Corynebacterium pauronietabolum*, *Curtobacterium* spp., *Desulforibtio* spp.; *Enterobacter* spp., *Flavobacterium* spp., *Gluconobacter* spp., *Hydrogenophage* spp., *Klebsiella* spp., *Lysobacter enzymogenes*, *Methylobacterium* spp., *Pasteuria* spp., for example *Pasteuria penetrans* (products known as EcoNem), *Pasteuria thornei*, *Pasteuria nishizawae,* in particular strain Pn1 (product known as Soyacyst LF/ST) , *Pasteuria reniformis*, in particular strain Pr3*; Pasteuria ramosa*, Candidatus *Pasteuria usgae* sp. nov., *Pseudomonas* spp., for example *Pseudomonas*

aeruginosa, *Pseudomonas aureofaciens*, *Pseudomonas cepacia*, *Pseudomonas chlororaphis*, *Pseudomonas fluorescens*, *Pseudomonas putida*, and *Paenibacillus* spp., for example *Paenibacillus macerans and Paenibacillus alvei*, *Phyllobacterium* spp., *Phingobacterium* spp., *Photorhabdus* spp., Rhizobacteria, *Rhizobium* spp., *Serratia* spp., *Stenotrotrophomonas* spp., *Xenorhabdus* spp. *Variovorax* spp.,

In a particularly preferred embodiment, the nematicidal biological control agent for a mixture Fluopyram and/or Bacillus subtilis, in particular strain QST 713 is at least one *Bacillus firmus* CNCM 1-1582 spore and/or *Bacillus cereus* strain CNCM 1-1562 spore as disclosed in U.S. Patent No. 6,406,690.

In other preferred embodiments, the bacteria for a mixture of Fluopyram and/or Bacillus subtilis, in particular strain QST 713 is at least one *B. amyloliquefaciens* IN937a, at least one *Bacillus subtilis* strain designation GB03, or at least one *B. pumilus* strain designation GB34. Combinations of the four species of above-listed bacteria, as well as other spore-forming, root-colonizing bacteria known to exhibit agriculturally beneficial properties are within the scope and spirit of the present invention.

Particularly preferred embodiments according to the invention are also those compositions that comprise mutants of *B. firmus* CNCM 1-1582 spore and/or *B. cereus* strain CNCM 1-1562 spore. Very particularly preferred are those mutants that have a nematicidal activity.

The present technology also provides embodiments in which the nematode- antagonistic biocontrol agent includes a nematophagous fungi, such as, but not limited to, ARF18 (Arkansas Fungus 18); *Arthrobotrys* spp., for example, *Arthrobotrys oligospora*, *Arthrobotrys superba* and *Arthrobotrys dactyloides*; *Chaetomium* spp., for example, *Chaetomium globosum*; *Cylindrocarpon* spp., for example, *Cylindrocarpon heteronema*; *Dactylaria* spp., for example, *Dactylaria candida*; *Exophilia* spp., for example, *Exophiala jeanselmei* and *Exophiala pisciphila*; *Fusarium* spp., for example *Fusarium solani*; *Gliocladium* spp., for example, *Gliocladium catenulatum*, *Gliocladium roseum* and *Gliocladium virens*; *Harposporium* spp., such as *Harposporium anguillulae*; *Hirsutella* spp., for example, *Hirsutella rhossiliensis, Hirsutella minnesotensis* and *Hirsutella thompsonii*, *Lecanicillium* spp., for example, *Lecanicillium lecanii* (=*Verticillium lecanii*); *Meristacrum* spp., for example, *Meristacrum asterospermum*; *Monacrosporium* spp., for example, *Monacrosporium drechsleri*, *Monacrosporium gephyropagum* and *Monacrosporium cionopagum*; *Myrothecium* spp., for example, *Myrotehcium verrucaria*, in particular strain AARC0255 (products known as Ditera 90 WG); *Nematoctonus* spp., for example, *Nematoctonus geogenius*, *Nematoctonus leiosporus*; *Neocosmospora* spp., for example, *Neocosmospora vasinfecta*; *Paecilomyces* spp., such as, *Paecilomyces lilacinus* and *Paecilomyces variotii*; *Pochonia* spp., such as *Pochonia chlamydosporia* (= Vercillium chlamydosporium; products known as KlamiC); *Stagonospora* spp., for example, *Stagonospora heteroderae* and *Stagonospora phaseoli*; *Streptomyces* spp. for example *Streptomyces saraceticus* and *Streptomyces venezuelae*, and vesicular-arbuscular mycorrhizal fungi, *Trichoderma* spp., for example *Trichoderma asperellum,*

Trichoderma brevicompactum, Trichoderma harzianum, Tsukamurella paurometabola, Verticillium chlamydosporium

Formulations

The present invention further relates to a composition comprising Fluopyram and/or Bacillus subtilis, in particular strain QST 713 for controlling Fusarium wilt in plants of the Musaceae family, in particular of the genus Musa. These are preferably compositions which comprise agriculturally suitable auxiliaries, solvents, carriers, surfactants or extenders.
Fluopyram and/or Bacillus subtilis, in particular strain QST 713 may be used as a combination. Fluopyram and/or Bacillus subtilis, in particular strain QST 713 may also be a composition, a tank mix, or a combipack.

According to the invention, a carrier is a natural or synthetic, organic or inorganic substance with which the active ingredients are mixed or combined for better applicability, in particular for application to plants or plant parts or seed. The carrier, which may be solid or liquid, is generally inert and should be suitable for use in agriculture.

Useful solid carriers include: for example ammonium salts and natural rock flours, such as kaolins, clays, talc, chalk, quartz, attapulgite, montmorillonite or diatomaceous earth, and synthetic rock flours, such as finely divided silica, alumina and silicates; useful solid carriers for granules include: for example, crushed and fractionated natural rocks such as calcite, marble, pumice, sepiolite and dolomite, and also synthetic granules of inorganic and organic flours, and granules of organic material such as paper, sawdust, coconut shells, maize cobs and tobacco stalks; useful emulsifiers and/or foam-formers include: for example nonionic and anionic emulsifiers, such as polyoxyethylene fatty acid esters, polyoxyethylene fatty alcohol ethers, for example alkylaryl polyglycol ethers, alkylsulphonates, alkyl sulphates, arylsulphonates and also protein hydrolysates; suitable dispersants are nonionic and/or ionic substances, for example from the classes of the alcohol-POE and/or -POP ethers, acid and/or POP POE esters, alkylaryl and/or POP POE ethers, fat and/or POP POE adducts, POE- and/or POP-polyol derivatives, POE- and/or POP-sorbitan or -sugar adducts, alkyl or aryl sulphates, alkyl- or arylsulphonates and alkyl or aryl phosphates or the corresponding PO-ether adducts. Additionally suitable are oligo- or polymers, for example those derived from vinylic monomers, from acrylic acid, from EO and/or PO alone or in combination with, for example, (poly)alcohols or (poly)amines. It is also possible to use lignin and its sulphonic acid derivatives, unmodified and modified celluloses, aromatic and/or aliphatic sulphonic acids and also their adducts with formaldehyde.

Fluopyram and/or Bacillus subtilis, in particular strain QST 713 can be converted to the customary formulations, such as solutions, emulsions, wettable powders, water- and oil-based suspensions, powders, dusts, pastes, soluble powders, soluble granules, granules for broadcasting, suspoemulsion concentrates, natural products impregnated with active ingredient, synthetic substances impregnated with active ingredient, fertilizers and also microencapsulations in polymeric substances.

Fluopyram and/or Bacillus subtilis, in particular strain QST 713 can be applied as such, in the form of their formulations or the use forms prepared therefrom, such as ready-to-use solutions, emulsions, water- or oil-based suspensions, powders, wettable powders, pastes, soluble powders, dusts, soluble granules, granules for broadcasting, suspoemulsion concentrates, natural products impregnated with active ingredient, synthetic substances impregnated with active ingredient, fertilizers and also microencapsulations in polymeric substances. Application is accomplished in a customary manner, for example by watering, spraying, atomizing, broadcasting, dusting, foaming, spreading-on and the like. It is also possible to deploy the active ingredients by the ultra-low volume method or to inject the active Fluopyram preparation/Fluopyram itself into the soil.

The formulations mentioned can be prepared in a manner known per se, for example by mixing the active ingredients with at least one customary extender, solvent or diluent, emulsifier, dispersant and/or binder or fixing agent, wetting agent, a water repellent, if appropriate siccatives and UV stabilizers and if appropriate dyes and pigments, antifoams, preservatives, secondary thickeners, stickers, gibberellins and also other processing auxiliaries.

The present invention includes not only formulations which are already ready for use and can be deployed with a suitable apparatus to the plant or the seed, but also commercial concentrates which have to be diluted with water prior to use.

Fluopyram and/or Bacillus subtilis, in particular strain QST 713 may be present as such or in their (commercial) formulations and in the use forms prepared from these formulations as a mixture with other (known) active ingredients, such as insecticides, attractants, sterilants, bactericides, acaricides, nematicides, fungicides, growth regulators, herbicides, fertilizers, safeners and/or semiochemicals.

The auxiliaries used may be those substances which are suitable for imparting particular properties to the composition itself or and/or to preparations derived therefrom (for example spray liquors, seed dressings), such as certain technical properties and/or also particular biological properties. Typical auxiliaries include: extenders, solvents and carriers.

Suitable extenders are, for example, water, polar and nonpolar organic chemical liquids, for example from the classes of the aromatic and nonaromatic hydrocarbons (such as paraffins, alkylbenzenes, alkylnaphthalenes, chlorobenzenes), the alcohols and polyols (which may optionally also be substituted, etherified and/or esterified), the ketones (such as acetone, cyclohexanone), esters (including fats and oils) and (poly)ethers, the unsubstituted and substituted amines, amides, lactams (such as N-alkylpyrrolidones) and lactones, the sulphones and sulphoxides (such as dimethyl sulphoxide).

Liquefied gaseous extenders or carriers are understood to mean liquids which are gaseous at standard temperature and under standard pressure, for example aerosol propellants such as halohydrocarbons, or else butane, propane, nitrogen and carbon dioxide.

In the formulations it is possible to use tackifiers such as carboxymethylcellulose, natural and synthetic polymers in the form of powders, granules or latices, such as gum arabic, polyvinyl alcohol and polyvinyl acetate, or else natural phospholipids such as cephalins and lecithins and synthetic phospholipids. Further additives may be mineral and vegetable oils.

If the extender used is water, it is also possible to use, for example, organic solvents as auxiliary solvents. Useful liquid solvents are essentially: aromatics such as xylene, toluene or alkylnaphthalenes, chlorinated aromatics or chlorinated aliphatic hydrocarbons such as chlorobenzenes, chloroethylenes or methylene chloride, aliphatic hydrocarbons such as cyclohexane or paraffins, for example petroleum fractions, alcohols such as butanol or glycol and their ethers and esters, ketones such as acetone, methyl ethyl ketone, methyl isobutyl ketone or cyclohexanone, strongly polar solvents such as dimethylformamide and dimethyl sulphoxide, or else water.

Compositions comprising Fluopyram and/or Bacillus subtilis, in particular strain QST 713 may additionally comprise further components, for example surfactants. Suitable surfactants are emulsifiers and/or foam formers, dispersants or wetting agents having ionic or nonionic properties, or mixtures of these surfactants. Examples thereof are salts of polyacrylic acid, salts of lignosulphonic acid, salts of phenolsulphonic acid or naphthalenesulphonic acid, polycondensates of ethylene oxide with fatty alcohols or with fatty acids or with fatty amines, substituted phenols (preferably alkylphenols or arylphenols), salts of sulphosuccinic esters, taurine derivatives (preferably alkyl taurates), phosphoric esters of polyethoxylated alcohols or phenols, fatty esters of polyols, and derivatives of the compounds containing sulphates, sulphonates and phosphates, for example alkylaryl polyglycol ethers, alkylsulphonates, alkyl sulphates, arylsulphonates, protein hydrolysates, lignosulphite waste liquors and methylcellulose. The presence of a surfactant is necessary if one of the active ingredients and/or one of the inert carriers is insoluble in water and when application is effected in water. The proportion of surfactants is between 5 and 40 per cent by weight of the inventive composition.

It is possible to use dyes such as inorganic pigments, for example iron oxide, titanium oxide and Prussian Blue, and organic dyes such as alizarin dyes, azo dyes and metal phthalocyanine dyes, and trace nutrients such as salts of iron, manganese, boron, copper, cobalt, molybdenum and zinc.

Further additives may be perfumes, mineral or vegetable, optionally modified oils, waxes and nutrients (including trace nutrients), such as salts of iron, manganese, boron, copper, cobalt, molybdenum and zinc.

Additional components may be stabilizers, such as cold stabilizers, preservatives, antioxidants, light stabilizers, or other agents which improve chemical and/or physical stability.

If appropriate, other additional components may also be present, for example protective colloids, binders, adhesives, thickeners, thixotropic substances, penetrants, stabilizers, sequestering agents, complex formers. In general, the active ingredients can be combined with any solid or liquid additive commonly used for formulation purposes.

The formulations contain generally between 0.05 and 99% by weight, 0.01 and 98% by weight, preferably between 0.1 and 95% by weight, more preferably between 0.5 and 90% of active ingredient, most preferably between 10 and 70 per cent by weight.

The formulations described above can be used for controlling *Fusarium wilt* in plants of the Musaceae family, in which the compositions comprising Fluopyram and/or Bacillus subtilis, in particular strain QST 713 are applied to the banana plants and/or their habitat, or to Fusarium oxysporum f. sp. Cubense itself.

The formulations described above can be used for controlling *Fusarium wilt* in plants of the Musaceae family, in which the compositions comprising Fluopyram and/or Bacillus subtilis, in particular strain QST 713 are applied to banana plants and/or their habitat, or to Fusarium oxysporum f. sp. Cubense itself.

Application methods

The treatment according to the invention of the plants and plant parts with Fluopyram and/or Bacillus subtilis, in particular strain QST 713 or compositions comprising Fluopyram and/or Bacillus subtilis, in particular strain QST 713 is carried out directly or by action on their surroundings, habitat or storage space using customary treatment methods, for example by dipping, spraying, atomizing, irrigating, stem injection, in-furrow application, evaporating, dusting, fogging, broadcasting, foaming, painting, spreading-on, watering (drenching), drip irrigating and, in the case of propagation material, in particular in the case of seeds, furthermore as a powder for dry seed treatment, a solution for seed treatment, a water-soluble powder for slurry treatment, by incrusting, by coating with one or more layers, etc. It is furthermore possible to apply Fluopyram and/or Bacillus subtilis, in particular strain QST 713 by the ultra-low volume method, or to inject the active Fluopyram preparation or Fluopyram itself into the soil. Preferred are methods for soil application drenching, in-furrow application, drip irrigating or irrigating. Fluopyram and/or Bacillus subtilis, in particular strain QST 713 can be applied preventive.

Application Rates

When using Fluopyram, the application rates can be varied within a relatively wide range, depending on the kind of application. The application rate of Fluopyram is

- in the case of treatment of plant parts, for example leaves: from 100 to 1000 g/ha , preferably from 200 to 500 g/ha, more preferably from 250 to 500 /ha, most preferably 250/ha, 375 g/ha or 500 /ha (in the case of application by watering or dripping, it is even possible to reduce the application rate, especially when inert substrates such as rockwool or perlite are used);
- in the case of soil treatment: from 100 to 1000 g/ha, preferably from 200 to 500 g/ha, more preferably from 250 to 500 /ha, most preferably 250/ha, 375 g/ha or 500 /ha.

When using Bacillus subtilis, in particular strain QST 713, the application rates can be varied within a relatively wide range, depending on the kind of application. The application rate of Bacillus subtilis, in particular strain QST 713is

- in the case of treatment of plant parts, for example leaves: from 10 to 3000 g/ha , preferably from 50 to 1500 g/ha, more preferably from 80 to 1500 /ha, most preferably from 80 to 300 g/ha (in the case of application by watering or dripping, it is even possible to reduce the application rate, especially when inert substrates such as rockwool or perlite are used);
- in the case of soil treatment: from 10 to 3000 g/ha, preferably from 50 to 1500 g/ha, more preferably from 80 to 1500 /ha, most preferably from 80 to 300 g/ha.

These application rates are merely by way of example and are not limiting for the purposes of the invention.

Examples

Example 1

EC 50 values for Fluopyram against FOC were assessed using assessment of fungal growth on Petri dishes with potato dextrose medium at concentration between 0.01 ppm, 0.1 ppm, 1 ppm, 10 ppm, 100 ppm, 1000 ppm. EC50 was determined at 0.6 ppm for Fluopyram and 0,0000013 ppm for B. subtilis QST 713.

Example 2

Banana plants were grown in single pots on soil previously sterilized and then inoculated with *Fusarium oxysporum* f.sp *cubense* race 1. Fluopyram was applied in an SC formulation of 500 g/l (Verango SC) with rates of 250 g/ha, 375 g/ha, 500 g/ha which was further diluted with water. Bacillus subtilis was applied in a 1,34 SC formulation comprising 134 g/l Bacillus subtilis QST 713 (which is equivalent to $1x10^{11}$ colony forming units (cfu) in rates of 0.6 l.

Aliette 80 WG comprises 80 % w/w Fosetyl-Aluminium.

Diease Rating Scale

0: healthy

1: slight symptoms

2: moderate disease symptoms

3: severe disease symptoms

4: dead plant

Active	**Application Rate Fluopyram**	**Application Rate B. subtilis Q713**	**Application Rate Fosetyl-Al**	**Disease severity**
Control with inoculation without treatment	0	0	0	1.68
Aliette	0	0	2 kg/ha	1.16
Aliette			4 kg/ha	1.44
Fluopyram	375 g/ha	0	0	0.64
B. subtilis Q713 0,6 L+ Fluopyram 1L+ Aliette 2,5 Kg	500 g/ha	81.6 g/ha	2 kg/ha	0.84
B. subtilis Q713 0,6 L+ Fluopyram 1L+	500 g/ha	81.6 g/ha	0	0.68
Fluopyram	500 g/ha	0	0	0.76

Example 3

Banana plants of the variety Gros Michel were grown in single pots on soil previously sterilized and then inoculated with *Fusarium oxysporum* f.sp *cubense* race 1 in the greenhouse. Fluopyram was applied in an SC formulation of 500 g/l (Verango SC) with rates of 250 g/ha, 375 g/ha, 500 g/ha which was further diluted with water. Bacillus subtilis was applied in a 1,34 SC formulation comprising 134 g/l Bacillus subtilis QST 713 (which is equivalent to $1x10^{11}$ colony forming units (cfu) in rates of 0.6 l. Aliette 80 WG comprises 80 % w/w Fosetyl-Aluminium. The trial was performed with 6 replicates, provided are the averages of five weekly evaluations.

Disease Rating Scale

0: no decoloration, healthy

1: small decolored spots

2: less than a third of plant is decolored

3: between one and two third of plant is decolored

4: more than two third of plant is decolored

5: total decoloration

Active	Application Rate Fluopyram	Application Rate B. subtilis Q713	Application Rate Fosetyl-Al	Disease severity
Control with inoculation without treatment	0	0	0	3.4
Aliette	0	0	2 kg/ha	3
Aliette			4 kg/ha	3.4
Fluopyram	375 g/ha	0	0	2.6
B. subtilis Q713 0,6 L+ Fluopyram 1L+ Aliette 2,5 Kg	500 g/ha	81.6 g/ha	2 kg/ha	2.6
B. subtilis Q713 0,6 L+ Fluopyram 1L+	500 g/ha	81.6 g/ha	0	2.6
Fluopyram	500 g/ha	0	0	2.4

Example 4

Banana plants of the variety Gros Michel were grown in single pots on soil unsterilized in the presence or absence of organic matter in the greenhouse. Bacillus subtilis was applied in a 1,34 SC formulation comprising 134 g/l Bacillus subtilis QST 713 (which is equivalent to $1x10^{11}$ colony forming units (cfu) in rates of 1 l, 3 L, 5L and 7L over a time range of six weeks while the total rate was splitted in six weekly applications. Number of replicates was six. After the completion of B. subtilis application the soil was inoculated with *Fusarium oxysporum* f.sp *cubense* race. Shown is the average of 5 data evaluations.

Disease Rating Scale (is this correct ?)

0: no decoloration, healthy

1: small decolored spots

2: less than a third of plant is decolored

3: between one and two third of plant is decolored

4: more than two third of plant is decolored

5: total decoloration

Active	Organic matter present	Application Rate B. subtilis Q713	Disease severity
Control with inoculation without treatment	no	0	1.6
Control with inoculation without treatment	yes	0	1.2
B. subtilis QST 713	no	134 g/ha	0.7
B. subtilis QST 713	yes	134 g/ha	0.8
B. subtilis QST 713	no	402 g/ha	0.9
B. subtilis QST 713	yes	402 g/ha	0.5
B. subtilis QST 713	no	670 g/ha	0.9
B. subtilis QST 713	yes	670 g/ha	0.4
B. subtilis QST 713	no	938 g/ha	0.9
B. subtilis QST 713	yes	938 g/ha	0.8

Example 5

Banana plants of the variety Gros Michel were grown in single pots on soil unsterilized in the presence or absence of organic matter in the greenhouse. Bacillus subtilis was applied in a 1,34 SC formulation comprising 134 g/l Bacillus subtilis QST 713 (which is equivalent to $1x10^{11}$ colony forming units (cfu) in rates of 1 l, 3 L, 5L and 7L over a time range of six weeks while the total rate was splitted in six weekly applications. Number of replicates was six. After the completion of B. subtilis application the soil was inoculated with *Fusarium oxysporum* f.sp *cubense* race. Shown is the average of five data evaluations.

Disease Rating Scale
0: no decoloration, healthy
1: small decolored spots
2: less than a third of plant is decolored
3: between one and two third of plant is decolored
4: more than two third of plant is decolored
5: total decoloration

Active	**Organic matter present**	**Application Rate B. subtilis Q713**	**Disease severity**
Control without inoculation without treatment	no	0	1
Control without inoculation without treatment	yes	0	1
Control with inoculation without treatment	no	0	5.4
Control with inoculation without treatment	yes	0	3.7
B. subtilis QST 713	no	134 g/ha	3.3
B. subtilis QST 713	yes	134 g/ha	2.9
B. subtilis QST 713	no	402 g/ha	3.4
B. subtilis QST 713	yes	402 g/ha	3.4
B. subtilis QST 713	no	670 g/ha	3.6
B. subtilis QST 713	yes	670 g/ha	2.6
B. subtilis QST 713	no	938 g/ha	3.3
B. subtilis QST 713	yes	938 g/ha	2.9

Example 6

Banana plants were grown in single pots on unsterilized soil. Fluopyram was applied in an SC formulation of 500 g/l (Verango SC) with rates of 250 g/ha, 375 g/ha, 500 g/ha which was further diluted with water. Bacillus subtilis was applied in a 1,34 SC formulation comprising 134 g/l Bacillus subtilis QST 713 (which is equivalent to $1x10^{11}$ colony forming units (cfu) in rates of 2 l over a time range of six weeks while the total rate was splitted in six weekly applications. Number of replicates was six. After the completion of Fluopyram/B. subtilis application the soil was inoculated with *Fusarium oxysporum* f.sp *cubense* race. Shown is the average of five data evaluations.

Diease Rating Scale

0: healthy

1: slight symptoms

2: moderate disease symptoms

3: severe disease symptoms

4: dead plant

Active	Application Rate Fluopyram	Application Rate B. subtilis Q713	Disease severity
Control without inoculation without treatment	0	0	0
Control with inoculation without treatment	0	0	1.1
Fluopyram	375 g/ha	0	0.3
Fluopyram	375 g/ha	0	0.4
Fluopyram	500 g/ha	0	0.2
B. subtilis Q713 2 L+ Fluopyram 1L	500 g/ha	268 g/ha	0.2

Example 7

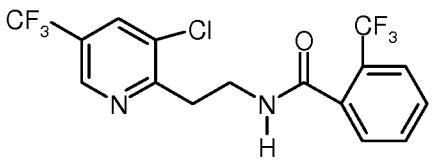
Banana plants were grown in single pots on unsterilized soil. Fluopyram was applied in an SC formulation of 500 g/l (Verango SC) with rates of 250 g/ha, 375 g/ha, 500 g/ha which was further diluted with water. Bacillus subtilis was applied in a 1,34 SC formulation comprising 134 g/l Bacillus subtilis QST 713 (which is equivalent to $1x10^{11}$ colony forming units (cfu) in rates of 2 l over a time range of six weeks while the total rate was splitted in six weekly applications. Number of replicates was six. After the completion of Fluopyram/B. subtilis application the soil was inoculated with *Fusarium oxysporum* f.sp *cubense* race. Shown is the average of five data evaluations.

0: no decoloration, healthy
1: small decolored spots
2: less than a third of plant is decolored
3: between one and two third of plant is decolored
4: more than two third of plant is decolored
5: total decoloration

Active	Application Rate Fluopyram	Application Rate B. subtilis Q713	Disease severity
Control without inoculation without treatment	0	0	1
Control with inoculation without treatment	0	0	4.6
Fluopyram	375 g/ha	0	1.4
Fluopyram	375 g/ha	0	1.7
Fluopyram	500 g/ha	0	1.6
B. subtilis Q713 2 L+ Fluopyram 1L	500 g/ha	268 g/ha	1.3

Claims

1. Use of the compound of the formula (I)



(I)

having the chemical name N-{2-[3-chloro-5-(trifluoromethyl)-2-pyridinyl]ethyl}-2-trifluoromethyl¬benzamide (Fluopyram) and/or Bacillus subtilis for controlling Fusarium wilt in plants of the Musaceae family.

2. Use according to claim 1, whereas the plants belong to the genus Musa.

3. Use according to any of claims 1 to 2, wherein at least one further agrochemically active compound or at least one nematicidal biological control agent is used.

4. Use according to any of claims 1 to 3 wherein Fluoyram is used.

5. Use according to any of claims 1 to 3 wherein Bacillus subtilis is used.

6. Use according to claim 5 wherein Bacillus subtilis strain QST 713 is used.

7. A method of controlling Fusarium wilt in plants of the Musaceae family by applying Fluopyram and/or Bacillus subtilis to those plants or to the environment the plants are growing in.

8. A method according to claim 7 wherein the plants belong to the Musa family.

9. A method according to claim 7 wherein Fluopyram is applied to the plants or to the environment the plants are growing in.

10. A method according to claim 7 wherein Bacillus subtilis is applied to the plants or to the environment the plants are growing in.

11. A method according to claim 7 wherein Bacillus subtilis strain QST 713 is applied to the plants or to the environment the plants are growing in.

12. Compositions comprising Fluopyram and/or Bacillus subtilis for controlling Fusarium wilt in plants of the Musaceae family.

13. Compositions comprising Fluopyram for controlling Fusarium wilt in plants of the Musaceae family.

14. Compositions comprising Bacillus subtilis for controlling Fusarium wilt in plants of the Musaceae family.

15. Compositions comprising Bacillus subtilis strain QST 713 for controlling Fusarium wilt in plants of the Musaceae family.

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