



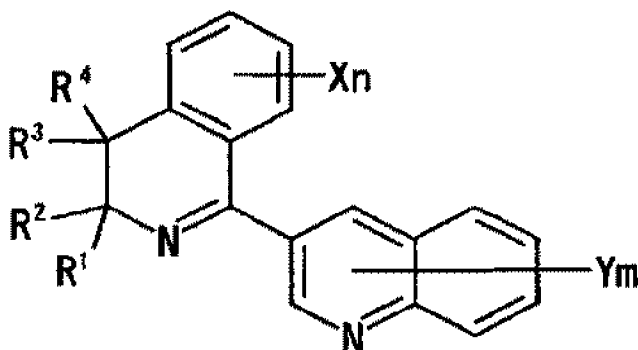
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(72) Inventeurs/Inventors:
SAKURAI, SEIYA, JP;
OHARA, TOSHIKI, JP;
MORIMOTO, MUNETSUGU, JP;
KONDO, NOBUHIRO, JP;
IKISHIMA, HIDEAKI, JP

(73) Propriétaire/Owner:

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MALADIE DE PLANTE PAR APPLICATION DE CETTE DERNIERE
(54) Title: PLANT DISEASE CONTROL COMPOSITION AND METHOD FOR CONTROLLING PLANT DISEASE BY
APPLICATION OF SAME



(I)

(57) Abrégé/Abstract:

Provided is a plant disease control composition that has a plurality of disease spectra against various plant pathogens and demonstrates superior control effects (synergistic control effects) that cannot be predicted from each component alone. The plant

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(73) Propriétaires(suite)/Owners(continued):MITSUI CHEMICALS AGRO, INC., JP

(74) Agent: SMART & BIGGAR LP

(57) Abrégé(suite)/Abstract(continued):

disease control composition comprises as active ingredients thereof at least one quinoline compounds represented by the following general formula: wherein, R1 and R2 represent, for example, optionally substituted alkyl groups or optionally substituted aryl groups, R3 and R4 represent, for example, hydrogen atoms, fluorine atom or methyl group, X represents, for example, a halogen atom or optionally substituted alkyl group, and Y represents a fluorine atom or methyl group, n is 0 to 2 and m is 0 or 1, or a salt thereof (group a), and one or more fungicidal compounds selected from group b.

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(72) Inventors: SAKURAI, Seiya; c/o MITSUI CHEMICALS AGRO, INC., 1144, Togo, Mobara-shi, Chiba, 2970017 (JP). OHARA, Toshiaki; c/o MITSUI CHEMICALS AGRO, INC., 1358, Ichimiya, Yasu-shi, Shiga, 5202362 (JP). MORIMOTO, Munetsugu; c/o MITSUI CHEMICALS AGRO, INC., 30, Asamuta-machi, Omuta-shi, Fukuoka, 8368610 (JP). KONDO, Nobuhiro; c/o MITSUI CHEMICALS AGRO, INC., Nihonbashi Dia Building, 1-19-1, Nihonbashi, Chuo-ku, Tokyo, 1030027 (JP). IKISHIMA, Hideaki; c/o MITSUI CHEMICALS AGRO, INC., 1144, Togo, Mobara-shi, Chiba, 2970017 (JP).

(74) Agents: TSUKUNI & ASSOCIATES et al.; Kojimachi Business Center, 5-3-1, Kojimachi, Chiyoda-ku, Tokyo, 1020083 (JP).

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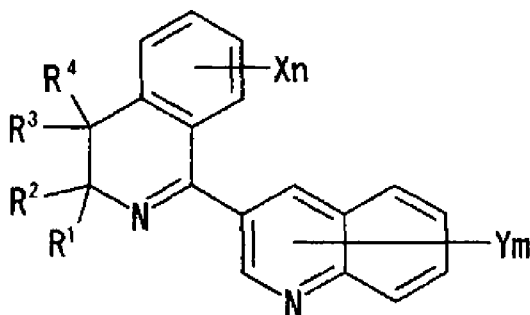
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(71) Applicant: MITSUI CHEMICALS AGRO, INC.
[JP/JP]; Nihonbashi Dia Building, 1-19-1, Nihonbashi,
Chuo-ku, Tokyo, 1030027 (JP).

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(54) Title: PLANT DISEASE CONTROL COMPOSITION AND METHOD FOR CONTROLLING PLANT DISEASE BY APPLICATION OF SAME



(I)

(57) Abstract: Provided is a plant disease control composition that has a plurality of disease spectra against various plant pathogens and demonstrates superior control effects (synergistic control effects) that cannot be predicted from each component alone. The plant disease control composition comprises as active ingredients thereof at least one quinoline compounds represented by the following general formula: wherein, R¹ and R² represent, for example, optionally substituted alkyl groups or optionally substituted aryl groups, R³ and R⁴ represent, for example, hydrogen atoms, fluorine atom or methyl group, X represents, for example, a halogen atom or optionally substituted alkyl group, and Y represents a fluorine atom or methyl group, n is 0 to 2 and m is 0 or 1, or a salt thereof (group a), and one or more fungicidal compounds selected from group b.

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DESCRIPTION

PLANT DISEASE CONTROL COMPOSITION AND METHOD FOR
CONTROLLING PLANT DISEASE BY APPLICATION OF SAME

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TECHNICAL FIELD

[0001] The present invention relates to a plant disease control composition, which is characterized by comprising as active ingredients thereof at least one quinoline compound represented by general formula (I) indicated below in the present description or a salt thereof (group a), and one or more fungicidal compound selected from the group consisting of compounds (b-1) to (b-106) (group b), and to a method for controlling plant disease by applying that composition.

BACKGROUND ART

15 [0002] Numerous chemical agents have conventionally been used to control plant diseases. However, the frequent use and over-administration of chemical agents having a similar structure and similar mode of action to control the same types of plant diseases has resulted in the significant problem of plant pathogens becoming resistant to these chemical agents.

20 [0003] On the other hand, there is currently a growing demand among consumers for agricultural products that are grown using reduced levels of agricultural chemicals as well as a social demand for a reduction in the burden that agricultural chemicals place on the environment.

[0004] In addition, in the case of treating agricultural crops by mixing two or more types of chemical agents by tank mixing at farm fields where chemical agents are actually used, the combining of incompatible chemical agents may cause a mutual reduction in the effects of the chemical agents or result in a considerable risk of causing phytotoxicity.

[0005] In consideration of such circumstances, there is a desire for a plant disease control composition that is highly effective against organisms that are resistant to existing chemical agents and exhibits higher efficacy using a smaller amount of active ingredient. Moreover, there is also a desire for a highly compatible plant disease control composition composed of components (compounds) having different basic structures and different modes of action and method for controlling plant disease in order to prevent plant pathogens from acquiring resistance.

35 [0006] A quinoline compound represented by general formula (I) is known to

demonstrate control effects as a fungicide against rice blast (*Pyricularia oryzae*) and against gray mold (*Botrytis cinerea*) in tomatoes, cucumbers and green beans by treating plants by seed disinfection or foliage spraying and the like (Patent Documents 1 to 4), while the mixing of a quinoline compound represented by general formula (I) with a certain type of fungicide is disclosed in Patent Document 5.

PRIOR ART DOCUMENTS

Patent Documents

[0007] Patent Document 1: International Publication No. WO 2005/070917

10 Patent Document 2: Japanese Unexamined Patent Publication No. 2007-1944

Patent Document 3: International Publication No. WO 2007/011022

Patent Document 4: Japanese Unexamined Patent Publication No.

2007-217353

Patent Document 5: Japanese Unexamined Patent Publication No. 2010-6746

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DISCLOSURE OF THE INVENTION

Problems to be Solved by the Invention

[0008] As a result of examining combinations of quinoline compounds represented by general formula (I) and other fungicidal components, the inventors of the present invention found that, by combining a quinoline compound represented by general formula (I) with a specific fungicidal compound, superior control effects (synergistic effects) are obtained against various plant pathogens that could not have been predicted from the individual components alone, stable preventive effects are demonstrated against organisms resistant to existing chemical agents, and the occurrence of chemical damage is not observed, thereby leading to completion of the present invention.

25

[0009] An object of the present invention is to provide a novel plant disease control composition, and method for controlling plant disease by applying that composition, that exhibits a plurality of disease spectra against various types of plant pathogens, demonstrates high plant disease control effects against organisms resistant to existing chemical agents, demonstrates a high level of activity even if the amount of active ingredient administered in a pathogen-rich environment is reduced, and is observed to be free of the occurrence of phytotoxicity.

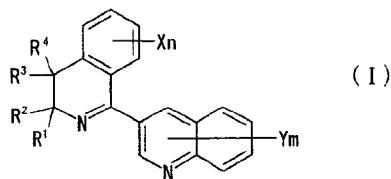
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Means for Solving the Problems

[0010] The present invention is a plant disease control composition comprising as active ingredients thereof:

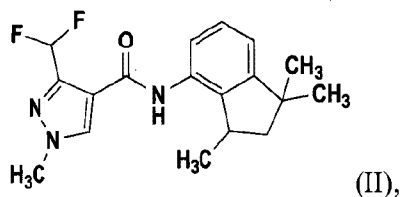
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(a) at least one quinoline compound represented by general formula (I) or a salt thereof (group a):

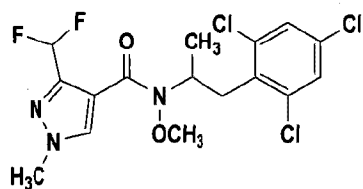


wherein,

- 5 R^1 and R^2 may be the same or different and represent a methyl group, ethyl group, propyl group, trifluoromethyl group, trifluoroethyl group, phenyl group, fluorophenyl group or chlorophenyl group,
- R^3 and R^4 may be the same or different and represent a hydrogen atom, fluorine atom or methyl group,
- 10 X represents a fluorine atom, chlorine atom, bromine atom, methyl group, ethynyl group, furyl group, thienyl group, cyano group, methoxyethanimidoyl group, ethoxyethanimidoyl group or phenoxyethanimidoyl group and n is 0, 1 or 2, and
- Y represents a fluorine atom or methyl group and m is 0 or 1; and
- one or more fungicidal compounds selected from:
- 15 pyrazole carboxamides consisting of
- (b-1) Fluxapyroxad,
- (b-2) Benzovindiflupyr,
- (b-3) a compound of formula (II)

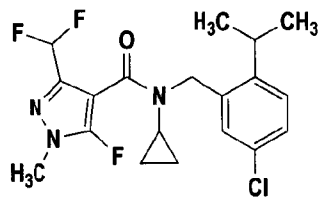


- 20 (b-4) Bixafen,
- (b-5) Penflufen,
- (b-6) Sedaxane,
- (b-7) Isopyrazam,
- (b-8) a compound of formula (III)



(III), and

(b-9) a compound of formula (IV)



(IV);

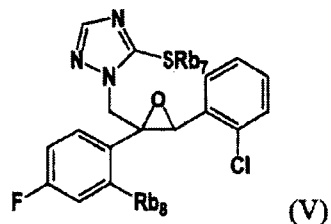
methoxyacrylates consisting of

- 5 (b-10) Enoxastrobin,
 (b-11) Pyraoxystrobin,
 (b-12) Coumoxystrobin,
 (b-13) Coumethoxystrobin,
 (b-14) Flufenoxystrobin,
 10 (b-15) Pyriminostrobin, and
 (b-16) Picoxystrobin;

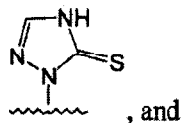
methoxycarbamates consisting of

- (b-17) Pyrametostrobin,
 (b-18) Triclopyricarb, and
 15 (b-19) Pyraclostrobin;
 azole compounds consisting of
 (b-20) Imazalil,
 (b-21) Prochloraz,
 (b-22) Tetraconazole,
 20 (b-23) Prothioconazole,
 (b-24) Epoxiconazole,
 (b-25) Ipconazole,
 (b-26) Metconazole,
 (b-27) Propiconazole,
 25 (b-28) Cyproconazole,
 (b-29) Difenoconazole,
 (b-30) Fluquinconazole,
 (b-31) Flusilazole,

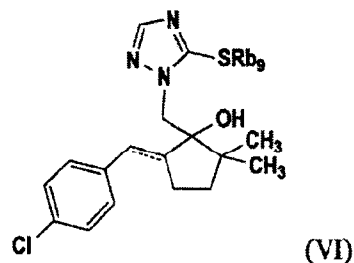
- (b-32) Penconazole,
 (b-33) Triadimenol,
 (b-34) Flutriafol,
 (b-35) Myclobutanil,
 5 (b-36) compounds of general formula (V)



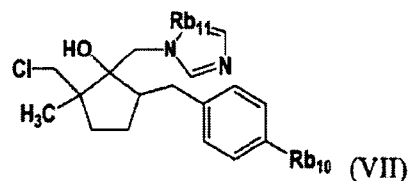
wherein Rb₇ represents a hydrogen atom, alkyl group, allyl group, benzyl group, amino group, cyano group or a valency that forms a double bond between a sulfur atom and a triazole ring to generate a ring represented by:



- Rb₈ represents a hydrogen atom or fluorine atom,
 (b-37) compounds of general formula (VI)



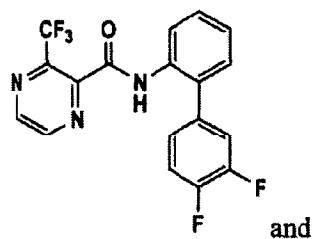
- wherein the broken line indicates the presence or absence of a bond, and Rb₉
 15 represents a hydrogen atom, alkyl group, allyl group, benzyl group or cyano group, and
 (b-38) compounds of general formula (VII)



wherein Rb₁₀ represents a halogen atom and Rb₁₁ represents a nitrogen atom or methine group;

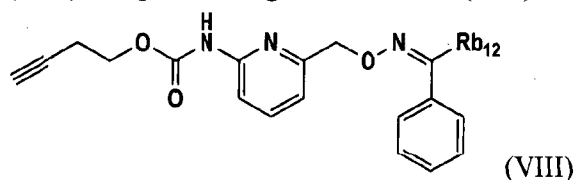
amide compounds consisting of

- (b-39) Zoxamide,
- (b-40) Fluopicolide,
- (b-41) Carboxin,
- 5 (b-42) Thifluzamide,
- (b-43) Fluopyram,
- (b-44) Mandipropamid,
- (b-45) Tiadinil,
- (b-46) Isotianil,
- 10 (b-47) Isofetamid,
- (b-48) Valifenalate,
- (b-49) Pyraziflumid,

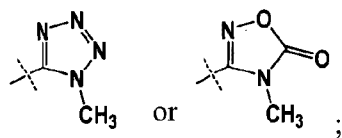


- (b-50) Iprovalicarb;
- 15 strobilurin compounds consisting of
- (b-51) Fluoxastrobin,
- (b-52) Dimoxystrobin,
- (b-53) Orysastrobin,
- (b-54) Metominostrobin,
- 20 (b-55) Trifloxystrobin,
- (b-56) Mandestrobin, and
- (b-57) Fenaminstrobin;
- benzimidazole compounds consisting of
- (b-58) Benomyl,
- 25 (b-59) Carbendazim, and
- (b-60) Thiabendazole;
- pyrimidine compounds consisting of
- (b-61) Cyprodinil, and
- (b-62) Pyrimethanil;
- 30 quinolone compounds consisting of
- (b-63) Quinoxifen, and

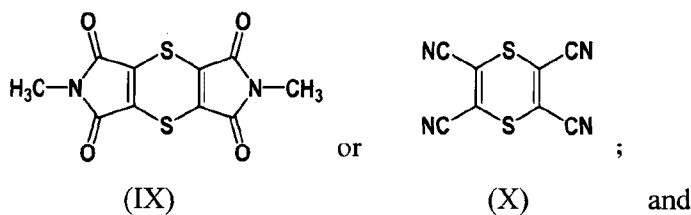
(b-64) Tebufloquin;
 morpholine compounds consisting of
 (b-65) Fenpropimorph, and
 (b-66) Tridemorph;
 5 organosulfur compounds consisting of
 (b-67) Metiram,
 (b-68) Thiuram,
 (b-69) Propineb,
 (b-70) Folpet,
 10 (b-71) Isoprothiolane,
 (b-72) Acibenzolar-S-methyl,
 (b-73) Probenazole, and
 (b-74) Chinomethionat;
 anilide compounds consisting of
 15 (b-75) Benalaxyl-M,
 (b-76) Pencycuron, and
 (b-77) Flutianil;
 aminopyridine compounds consisting of
 (b-78) Picarbutrazox, and
 20 (b-79) compounds of general formula (VIII)



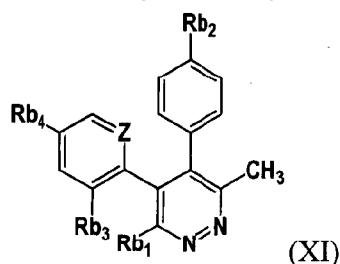
wherein Rb₁₂ represents



dithiine compounds consisting of
 25 (b-80)

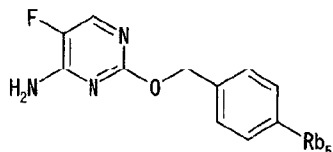


- (b-81) Dithianon;
 phenylketone compounds consisting of
 (b-82) Metrafenone, and
 (b-83) Pyriofenone;
 5 other fungicidal compounds (i) consisting of
 (b-84) Oxathiapiprolin,
 (b-85) compounds of general formula (XI)

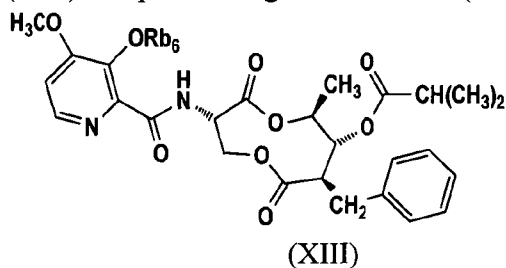


- wherein Rb₁ represents a chlorine atom, bromine atom, cyano group, methyl
 10 group or methoxy group, Rb₂ represents a fluorine atom or hydrogen atom, Rb₃
 represents a halogen atom, Rb₄ represents a halogen atom, methoxy group or hydrogen
 atom and Z represents N or C-F,

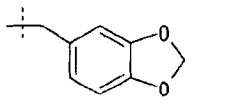
(b-86) compounds of general formula (XII)



- 15 wherein Rb₅ represents a methyl group or fluorine atom,
 (b-87) compounds of general formula (XIII)



- wherein Rb₆ represents -CH₂OC(O)CH(CH₃)₂, -C(O)CH₃, -CH₂OC(O)CH₃,
 20 -C(O)OCH₂CH(CH₃)₂ or



(b-88) a compound of formula (XIV)

(XIV),

(XV),

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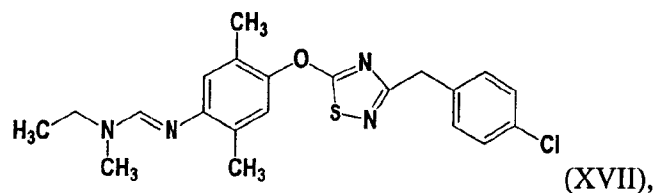
Rb₁₅ represents a chlorine atom or bromine atom,

Cc1cc(Cc2cc(OC)cc2)nc(C3=NC4=CC=CC=C4N3)n1

(XVI)

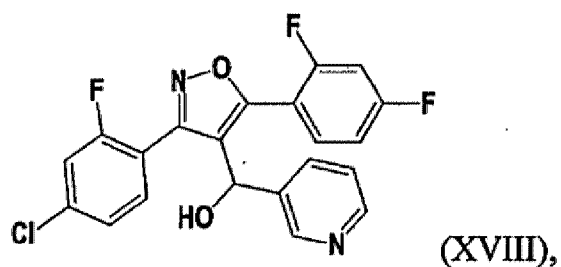
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(b-91) a compound of formula (XVII)



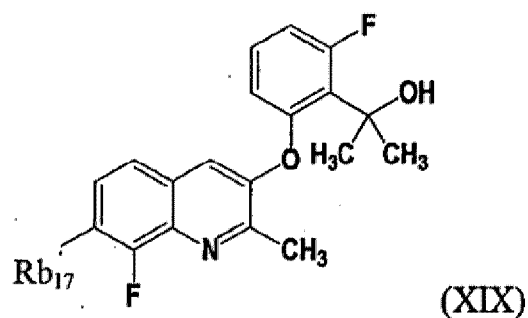
(XVII),

(b-92) a compound of formula (XVIII)



(b-93) D-tagatose,

(b-94) compounds of general formula (XIX)



wherein Rb₁₇ represents a hydrogen atom or fluorine atom;

other fungicidal compounds (iii) consisting of

(b-93) Ametoctradin,

(b-94) Sulfur,

(b-95) Amisulbrom,

(b-98) Pyribencarb,

(b-99) Fenpyrazamine,

(b-100) Proquinazid,

(b-101) Spiroxamine,

(b-102) Fenpropidin,

(b-103) Pyrisoxazole,

(b-104) Pyroquilon,

(b-105) Phosphorous acid, and

(b-106) Hydroxyisoxazole (Hymexazol).

Furthermore, in the quinoline compounds represented by general formula (I),
Y_m represents a hydrogen atom when m is 0 and X_n represents a hydrogen atom when
n is O.

[0010a] The present invention as claimed relates to a fungicidal composition for plants

5 comprising as active ingredients thereof:

(a) at least one quinoline compound selected from the group consisting of:

(a-14) 3-(5-fluoro-3,3,4,4-tetramethyl-3,4-dihydroisoquinolin-1-yl)quinoline,

(a-18) 3-(4,4-difluoro-3,3-dimethyl-3,4-dihydroisoquinolin-1-yl)quinoline, and

(a-20) 3-(4,4,5-trifluoro-3,3-dimethyl-3,4-dihydroisoquinolin-1-yl)quinoline, or a salt thereof

10 (group a); and

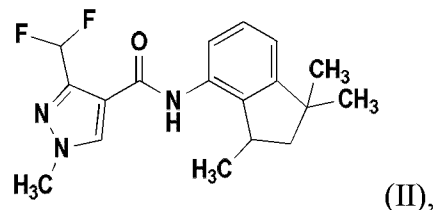
(b) one or more fungicidal compounds selected from (group b):

pyrazole carboxamides consisting of

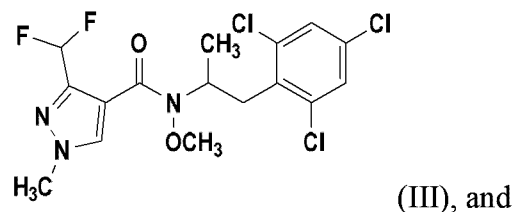
(b-1) Fluxapyroxad,

(b-2) Benzovindiflupyr,

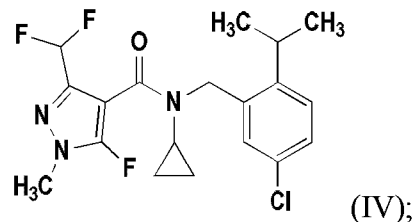
15 (b-3) a compound of formula (II)



(b-8) a compound of formula (III)



(b-9) a compound of formula (IV)

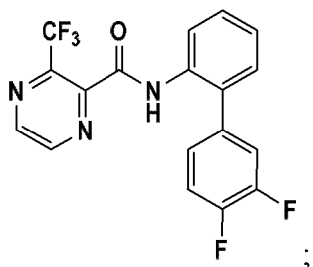


20

amide compounds consisting of

(b-47) Isofetamid, and

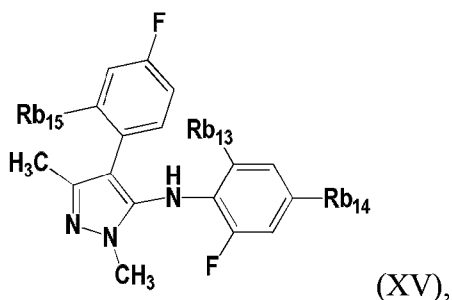
(b-49) Pyraziflumid,



other fungicidal compounds (i) consisting of

5 (b-84) Oxathiapiprolin, and

(b-89) compounds of general formula (XV)



wherein Rb₁₃ represents a chlorine atom or fluorine atom,

Rb₁₄ represents a chlorine atom or hydrogen atom and

10 Rb₁₅ represents a chlorine atom or bromine atom;

provided that a combination of (a-18) and (b-8) or (b-9) is excluded.

EFFECTS OF THE INVENTION

15 [0011] The plant disease control composition of the present invention has a plurality of disease spectra against various plant pathogens, including fungicide-resistant organisms (such as *Pyricularia oryzae* that causes rice blast or *Botrytis cinerea* that causes gray mold in tomatoes, cucumbers and green beans), and demonstrates superior

control effects (synergistic control effects) that could not have been predicted from the individual components alone. In addition, the plant disease control composition of the present invention exhibits a high level of plant disease control effects even against organisms resistant to existing chemical agents and is also observed to be free of the occurrence of phytotoxicity.

BEST MODE FOR CARRYING OUT THE INVENTION

[0012] Each of the terms used for the quinoline compounds represented by general formula (I) in the scope of claim for patent and description of the present application are in accordance with definitions commonly used in the field of chemistry as well as the definitions described in International Publication No. WO 2005/070917, Japanese Unexamined Patent Publication No. 2007-1944, International Publication No. WO 2007/011022 and Japanese Unexamined Patent Publication No. 2007-217353.

[0013] The quinoline compound represented by general formula (I) in the present invention can be in the form of a salt in the manner of a salt of an inorganic acid such as a hydrochloride, sulfate or nitrate, in the form of a phosphate, in the form of a sulfonate such as a methanesulfonate, ethanesulfonate, benzenesulfonate or p-toluenesulfonate, or in the form of a salt of an organic carboxylic acid such as an acetate, benzoate, oxalate, fumarate or salicylate (and preferably in the form of a hydrochloride, sulfate, nitrate, methanesulfonate, oxalate, fumarate or salicylate).

[0014] The quinoline compound represented by general formula (I) of the present invention and salts thereof can also be in the form of a solvate, and these solvates are also included in the present invention. The solvate is preferably a hydrate.

[0015] Some quinoline compounds represented by general formula (I) in the present invention are compounds that have an asymmetric carbon, and in such cases, the invention of the present application also includes compounds having one type of optically active form as well as mixtures containing a plurality of optically active forms at an arbitrary ratio.

[0016] The quinoline compound represented by general formula (I) in the present invention is preferably:

- (a-1) 3-(5-fluoro-3,3-dimethyl-3,4-dihydroisoquinolin-1-yl)quinoline,
- (a-2) 3-(5-chloro-3,3-dimethyl-3,4-dihydroisoquinolin-1-yl)quinoline,
- (a-3) 3-(5-bromo-3,3-dimethyl-3,4-dihydroisoquinolin-1-yl)quinoline,
- (a-4) 3-(5-ethynyl-3,3-dimethyl-3,4-dihydroisoquinolin-1-yl)quinoline,
- (a-5) 3-(5,6-difluoro-3,3-dimethyl-3,4-dihydroisoquinolin-1-yl)quinoline
- (a-6) 3-(3-ethyl-5-fluoro-3-propyl-3,4-dihydroisoquinolin-1-yl)quinoline

- (a-7) 3-(5-fluoro-3-methyl-3-propyl-3,4-dihydroisoquinolin-1-yl)quinoline
 (a-8) 3-(3-methyl-3-trifluoromethyl-3,4-dihydroisoquinolin-1-yl)quinoline
 (a-9) 3-[3-methyl-3-(2,2,2-trifluoroethyl)-3,4-dihydroisoquinolin-1-yl]
 quinoline
 5 (a-10) 3-[3-methyl-3-phenyl-3,4-dihydroisoquinolin-1-yl]quinoline
 (a-11) 3-[3-methyl-3-(4-fluorophenyl)-3,4-dihydroisoquinolin-1-yl]quinoline
 (a-12) 3-[3-methyl-3-(4-chlorophenyl)-3,4-dihydroisoquinolin-1-yl]quinoline
 (a-13) 3-(3,3,4,4-tetramethyl-3,4-dihydroisoquinolin-1-yl)quinoline
 (a-14) 3-(5-fluoro-3,3,4,4-tetramethyl-3,4-dihydroisoquinolin-1-yl)quinoline
 10 (a-15) 3-(5-fluoro-3,3,4,4-tetramethyl-3,4-dihydroisoquinolin-1-yl)-6-
 fluoroquinoline
 (a-16) 3-(5-fluoro-3,3,4,4-tetramethyl-3,4-dihydroisoquinolin-1-yl)-8-
 fluoroquinoline
 (a-17) 3-(5-fluoro-3,3,4,4-tetramethyl-3,4-dihydroisoquinolin-1-yl)-8-
 15 methylquinoline
 (a-18) 3-(4,4-difluoro-3,3-dimethyl-3,4-dihydroisoquinolin-1-yl)quinoline
 (a-19) 3-(4,5-difluoro-3,3-dimethyl-3,4-dihydroisoquinolin-1-yl)quinoline,
 (a-20) 3-(4,4,5-trifluoro-3,3-dimethyl-3,4-dihydroisoquinolin-1-yl)quinoline,
 or
 20 a salt thereof.

[0017] In more preferable embodiment of the present invention, the quinolone compound represented by general formula (I) is selected from the group consisting of:

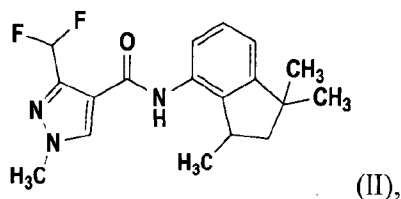
- (a-14) 3-(5-fluoro-3,3,4,4-tetramethyl-3,4-dihydroisoquinolin-1-yl)quinoline
 (a-18) 3-(4,4-difluoro-3,3-dimethyl-3,4-dihydroisoquinolin-1-yl)quinolone,
 25 (a-20) 3-(4,4,5-trifluoro-3,3-dimethyl-3,4-dihydroisoquinolin-1-yl)quinoline,
 and a salt thereof.

[0018] Quinoline compounds represented by general formula (I) in the present invention (group a compounds) are known compounds, and are produced according to, for example, the method described in International Publication No. WO 2005/070917,
 30 or methods complying therewith.

[0019] The fungicidal compound contained with at least one quinoline compound represented by general formula (I) or a salt thereof in the present invention (group a) is preferably selected from:

- pyrazole carboxamides consisting of
 35 (b-1) Fluxapyroxad,
 (b-2) Benzovindiflupyr,

(b-3) a compound of formula (II)



(b-4) Bixafen,

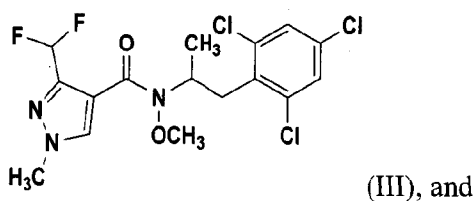
(b-5) Penflufen,

5

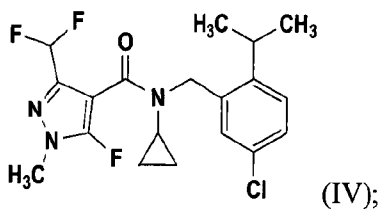
(b-6) Sedaxane,

(b-7) Isopyrazam,

(b-8) a compound of formula (III)



(b-9) a compound of formula (IV)



10

methoxyacrylates consisting of

(b-16) Picoxystrobin;

methoxycarbamates consisting of

(b-19) Pyraclostrobin;

15

azole compounds consisting of

(b-20) Imazalil,

(b-21) Prochloraz,

(b-22) Tetraconazole,

(b-23) Prothioconazole,

20

(b-24) Epoxiconazole,

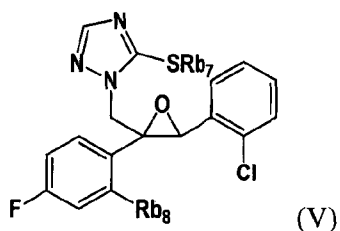
(b-25) Ipconazole,

(b-26) Metconazole,

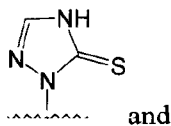
(b-27) Propiconazole,

(b-28) Cyproconazole,

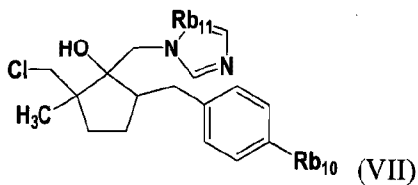
- (b-29) Difenconazole,
 (b-30) Fluquinconazole,
 (b-31) Flusilazole,
 (b-32) Penconazole,
 5 (b-33) Triadimenol,
 (b-34) Flutriafol,
 (b-35) Myclobutanil,
 (b-36) compounds of general formula (V)



- 10 wherein Rb₇ represents a hydrogen atom, alkyl group, allyl group, benzyl group, cyano group or a valency that forms a double bond between a sulfur atom and a triazole ring to generate a ring represented by:



- 15 Rb₈ represents a hydrogen atom or fluorine atom, and
 (b-38) compounds of general formula (VII)

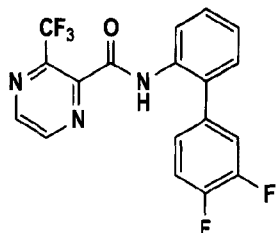


wherein Rb₁₀ represents a halogen atom and Rb₁₁ represents a nitrogen atom or methine group;

amide compounds consisting of

- 20 (b-39) Zoxamide,
 (b-40) Fluopicolide,
 (b-41) Carboxin,
 (b-42) Thifluzamide,
 (b-43) Fluopyram,
 25 (b-44) Mandipropamid,

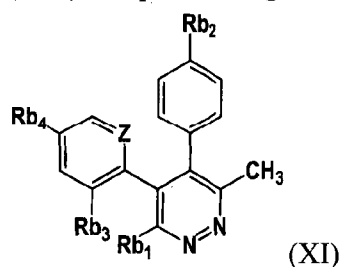
- (b-45) Tiadinil,
(b-46) Isotianil,
(b-47) Isofetamid,
(b-49) Pyraziflumid,



; and

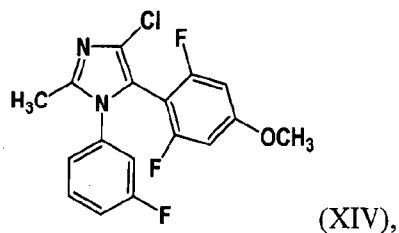
- (b-50) Iprovalicarb;
strobilurin compounds consisting of
(b-51) Fluoxastrobin,
(b-52) Dimoxystrobin,
(b-53) Orysastrobin,
(b-54) Metominostrobin, and
(b-55) Trifloxystrobin ;
benzimidazole compounds consisting of
(b-58) Benomyl,
(b-59) Carbendazim, and
(b-60) Thiabendazole;
pyrimidine compounds consisting of
(b-61) Cyprodinil, and
(b-62) Pyrimethanil;
quinolone compounds consisting of
(b-63) Quinoxifen, and
(b-64) Tebufloquin;
morpholine compounds consisting of
(b-65) Fenpropimorph, and
(b-66) Tridemorph;
organosulfur compounds consisting of
(b-67) Metiram,
(b-68) Thiuram,
(b-69) Propineb,
(b-70) Folpet,
(b-71) Isoprothiolane,

(b-72) Acibenzolar-S-methyl,
 (b-73) Probenazole, and
 (b-74) Chinomethionat;
 anilide compounds consisting of
 5 (b-75) Benalaxyl-M,
 (b-76) Pencycuron, and
 (b-77) Flutianil;
 an aminopyridine compound consisting of
 (b-78) Picarbutrazox;
 10 a dithiine compound consisting of
 (b-81) Dithianon;
 phenylketone compounds consisting of
 (b-82) Metrafenone, and
 (b-83) Pyriofenone;
 15 other fungicidal compounds (i) consisting of
 (b-84) Oxathiapiprolin
 (b-85) compounds of general formula (XI)



wherein Rb₁ represents a chlorine atom, bromine atom, cyano group, methyl
 20 group or methoxy group, Rb₂ represents a fluorine atom or hydrogen atom, Rb₃
 represents a halogen atom, Rb₄ represents a halogen atom, methoxy group or hydrogen
 atom and Z represents N or C-F,

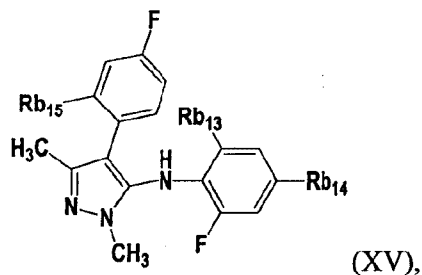
(b-88) a compound of formula (XIV)



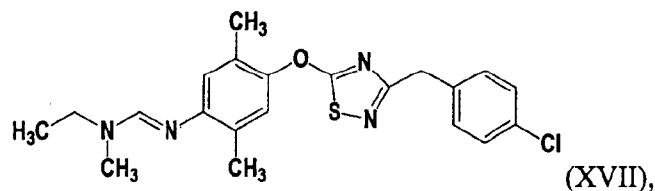
25 (b-89) compounds of general formula (XV)

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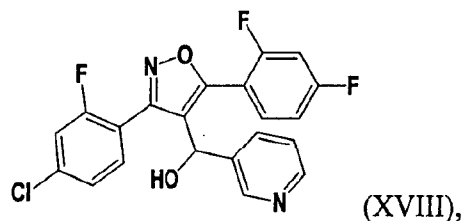
- 17 -



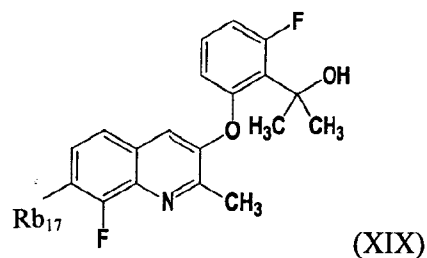
wherein Rb₁₃ represents a chlorine atom or fluorine atom,
 Rb₁₄ represents a chlorine atom or hydrogen atom and
 Rb₁₅ represents a chlorine atom or bromine atom,
 other fungicidal compounds (ii) consisting of:
 (b-91) a compound of formula (XVII)



(b-92) a compound of formula (XVIII)



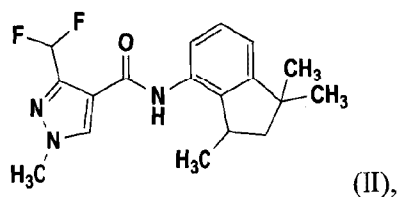
(b-93) D-tagatose, and
 (b-94) compounds of general formula (XIX)



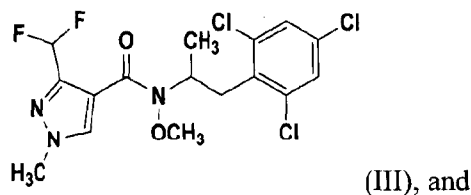
wherein Rb₁₇ represents a hydrogen atom or fluorine atom;
 other fungicidal compounds (iii) consisting of:
 (b-95) Ametocetradin,
 (b-96) Sulfur;
 (b-97) Amisulbrom,

(b-98) Pyribencarb,
 (b-99) Fenpyrazamine,
 (b-100) Proquinazid,
 (b-101) Spiroxamine,
 (b-102) Fenpropidin,
 (b-103) Pyrisoxazole,
 (b-104) Pyroquilon,
 (b-105) Phosphorous acid, and
 (b-106) Ilydroxyisoxazole (Ilymexazol),

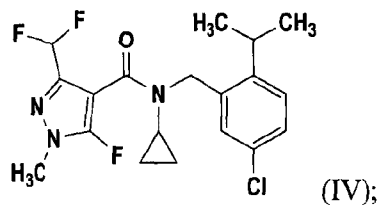
10 [0020] and more preferably selected from:
 pyrazole carboxamides consisting of
 (b-1) Fluxapyroxad,
 (b-2) Benzovindiflupyr,
 (b-3) a compound of formula (II)



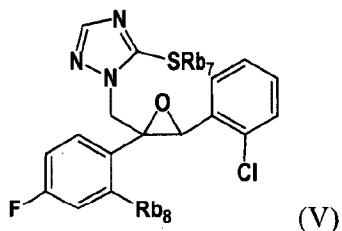
(b-8) a compound of formula (III)



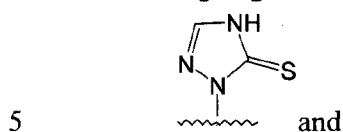
(b-9) a compound of formula (IV)



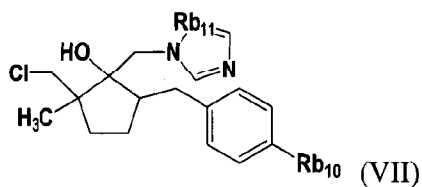
azole compounds consisting of
 (b-36) compounds of general formula (V)



wherein Rb₇ represents a hydrogen atom, alkyl group, allyl group, benzyl group, cyano group or a valency that forms a double bond between a sulfur atom and a triazole ring to generate a ring represented by:

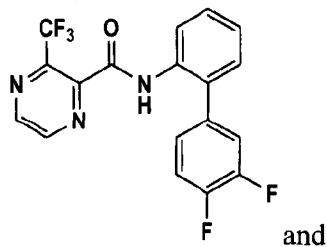


Rb₈ represents a hydrogen atom or fluorine atom, and
(b-38) compounds of general formula (VII)

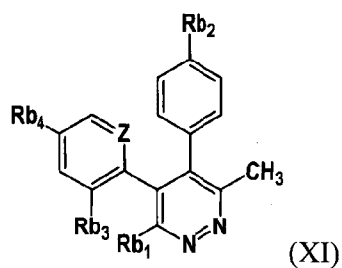


10 wherein Rb₁₀ represents a halogen atom and Rb₁₁ represents a nitrogen atom or methine group;

amide compounds consisting of
(b-47) Isofetamid, and
(b-49) Pyraziflumid,

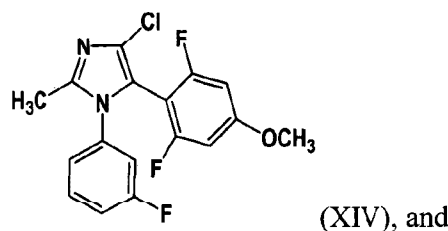


15 an aminopyridine compound consisting of
(b-78) Picarbutrazox;
other fungicidal compounds (i) consisting of
(b-84) Oxathiapiprolin
(b-85) compounds of general formula (XI)

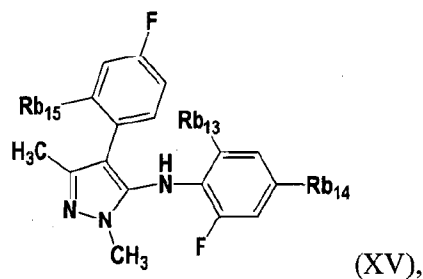


wherein Rb₁ represents a chlorine atom, bromine atom, cyano group, methyl group or methoxy group, Rb₂ represents a fluorine atom or hydrogen atom, Rb₃ represents a halogen atom, Rb₄ represents a halogen atom, methoxy group or hydrogen atom and Z represents N or C-F,

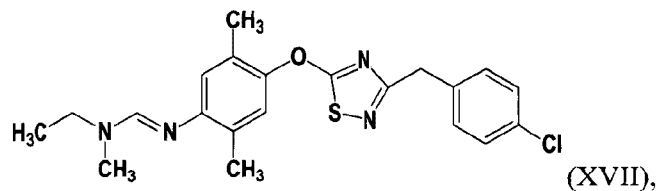
(b-88) a compound of formula (XIV)



(b-89) compounds of general formula (XV)

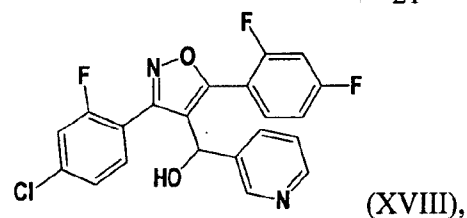


wherein Rb₁₃ represents a chlorine atom or fluorine atom, Rb₁₄ represents a chlorine atom or hydrogen atom and Rb₁₅ represents a chlorine atom or bromine atom;
other fungicidal compounds (ii) consisting of
(b-91) a compound of formula (XVII)

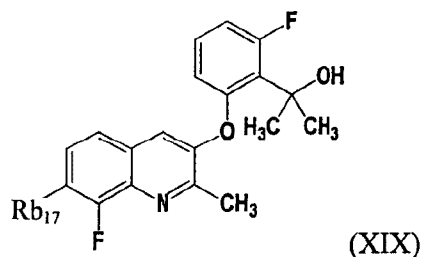


(b-92) a compound of formula (XVIII)

- 21 -



(b-94) compounds of general formula (XIX)



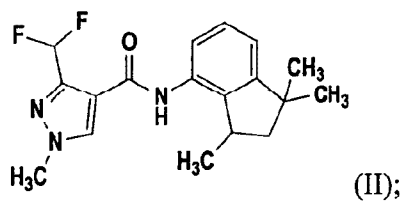
[0021] and still more preferably selected from:

pyrazole carboxamides consisting of

(b-1) Fluxapyroxad,

(b-2) Benzovindiflupyr, and

(b-3) a compound of formula (II)



methoxyacrylates consisting of

(b-10) Enoxastrobin,

(b-11) Pyraoxystrobin,

(b-12) Coumoxystrobin,

(b-13) Coumethoxystrobin,

(b-14) Flufenoxystrobin, and

(b-15) Pyriminostrobin;

methoxycarbamates consisting of

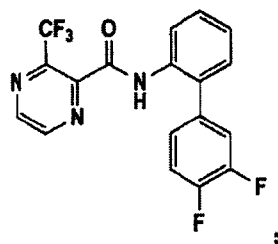
(b-17) Pyrametostrobin, and

(b-18) Triclopyricarb;

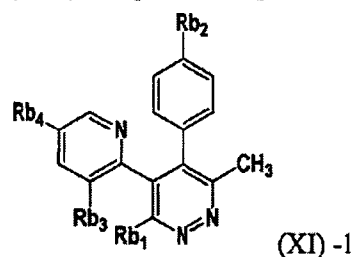
(b-84) Oxathiapiprolin;

(b-56) Mandestrobin;

- (b-47) Isofetamid;
 (b-78) Picarbutrazox;
 (b-57) Fenaminstrobin;
 (b-48) Valifenalate;
 5 (b-49) Pyraziflumid,

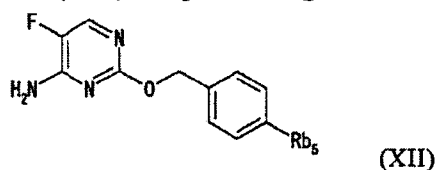


(b-85) compounds of general formula (XI)-1

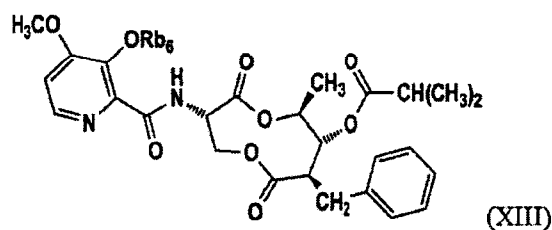


- wherein Rb₁ represents a chlorine atom, bromine atom, cyano group, methyl
 10 group or methoxy group, Rb₂ represents a fluorine atom or hydrogen atom, Rb₃
 represents a halogen atom, Rb₄ represents a halogen atom, methoxy group or hydrogen
 atom;

(b-86) compounds of general formula (XII)

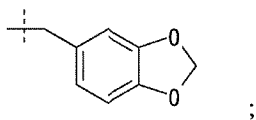


- wherein Rb₅ represents a methyl group or fluorine atom;
 15 (b-87) compounds of general formula (XIII)

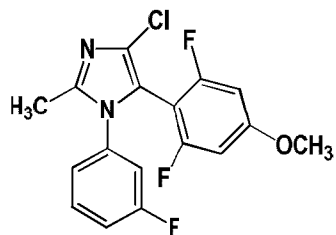


wherein Rb₆ represents -CH₂OC(O)CH(CH₃)₂, -C(O)CH₃, -CH₂OC(O)CH₃,

$-\text{C}(\text{O})\text{OCH}_2\text{CH}(\text{CH}_3)_2$ or



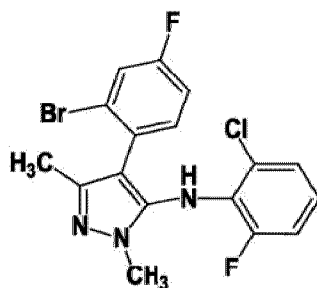
(b-88) a compound of formula (XIV)



(XIV);

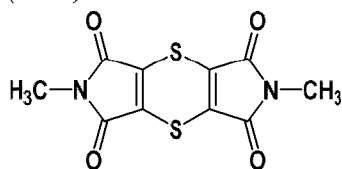
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(b-89) a compound of formula (XV)-1



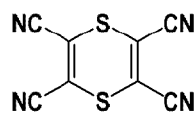
(XV)-1;

(b-80)



(IX)

or

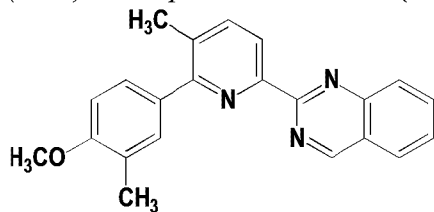


(X)

and

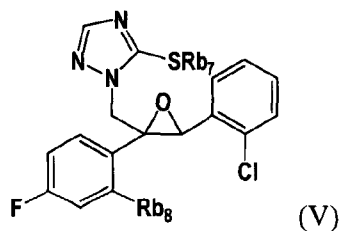
10

(b-90) a compound of formula (XVI)-1



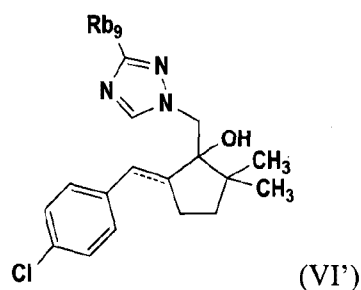
;(XVI)-1;

(b-36) compounds of general formula (V)



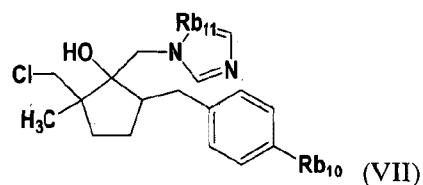
wherein Rb₇ represents a hydrogen atom, alkyl group, amino group or cyano group, and Rb₈ represents a hydrogen atom or fluorine atom;

(b-37') compounds of general formula (VI')



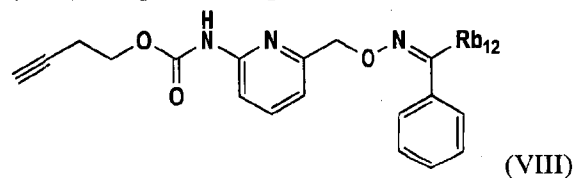
wherein the broken line indicates the presence or absence of a bond, and Rb₉ represents a hydrogen atom, alkyl group, amino group or cyano group;

(b-38) compounds of general formula (VII)

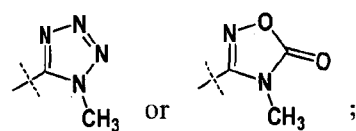


wherein Rb₁₀ represents a halogen atom and Rb₁₁ represents a nitrogen atom or methine group; and

(b-79) compounds of general formula (VIII)



wherein Rb₁₂ represents



[0022] and further more preferably selected from:

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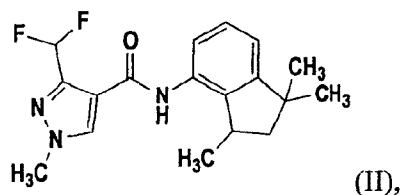
- 25 -

pyrazole carboxamides consisting of

(b-1) Fluxapyroxad,

(b-2) Benzovindiflupyr, and

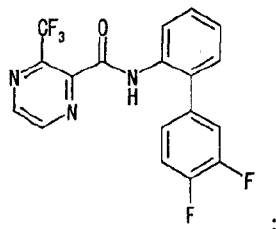
(b-3) a compound of formula (II)



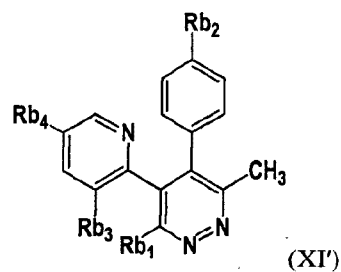
(b-47) Isofetamid;

(b-78) Picarbutrazox;

(b-49) Pyraziflumid,

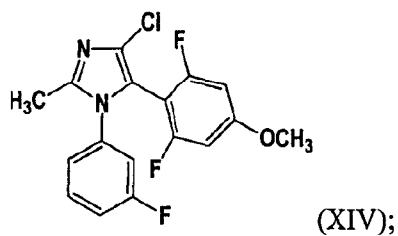


(b-85) compounds of general formula (XI')

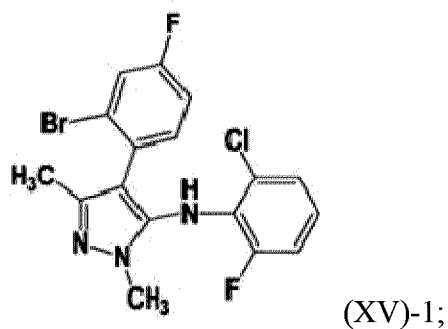
wherein Rb₁ represents a chlorine atom, bromine atom, cyano group, methylgroup or methoxy group, Rb₂ represents a fluorine atom or hydrogen atom, Rb₃represents a halogen atom, and Rb₄ represents a halogen atom, methoxy group or

15 hydrogen atom;

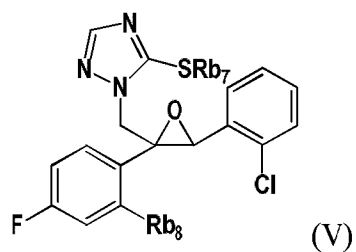
(b-88) a compound of formula (XIV)



(b-89) a compound of formula (XV)-1

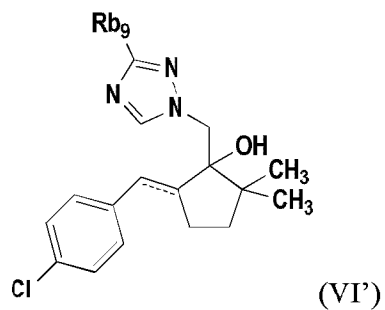


(b-36) compounds of general formula (V)



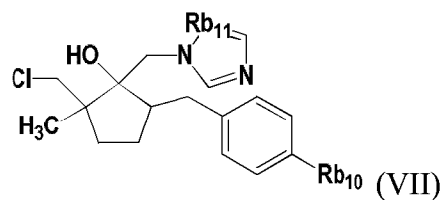
- 5 wherein Rb₇ represents a hydrogen atom, alkyl group, amino group or cyano group, and Rb₈ represents a hydrogen atom or fluorine atom;

(b-37') compounds of general formula (VI')



- 10 wherein the broken line indicates the presence or absence of a bond, and Rb₉ represents a hydrogen atom, alkyl group, amino group or cyano group;

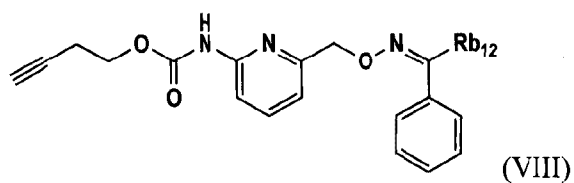
(b-38) compounds of general formula (VII)



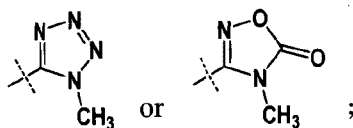
- 26a -

wherein Rb_{10} represents a halogen atom and Rb_{11} represents a nitrogen atom or methine group; and

(b-79) compounds of general formula (VIII)

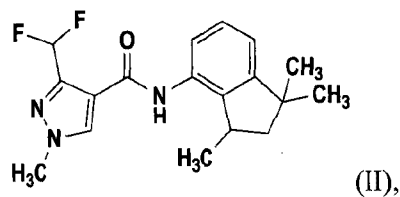


wherein Rb₁₂ represents

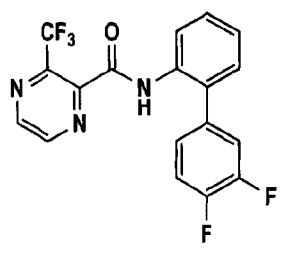


[0023] and most preferably selected from:

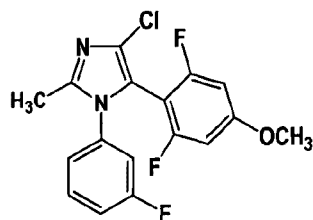
- 5 pyrazole carboxamides consisting of
 (b-1) Fluxapyroxad,
 (b-2) Benzovindiflupyr, and
 (b-3) a compound of formula (II)



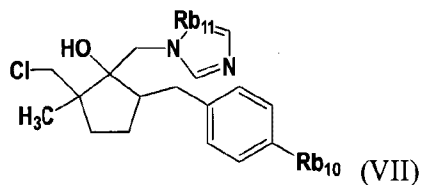
- 10 (b-47) Isofetamid;
 (b-78) Picarbutrazox;
 (b-49) Pyraziflumid,



(b-88) a compound of formula (XIV)



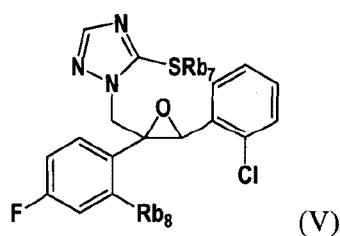
(b-38) compounds of general formula (VII)



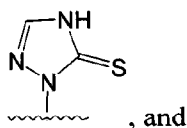
wherein Rb₁₀ represents a halogen atom and Rb₁₁ represents a nitrogen atom or methine group.

[0024] In any one of the preferable embodiments described above, the compound

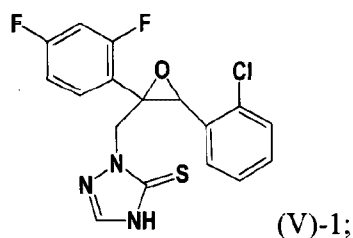
5 (b-36) represented by general formula (V):



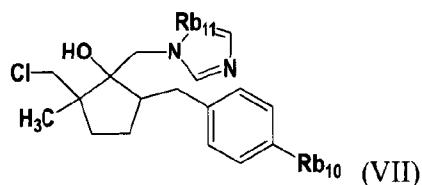
is preferably a compound wherein Rb₇ represents a valency that forms a double bond between a sulfur atom and a triazole ring to generate a moiety represented by:



10 Rb₈ represents a fluorine atom, that is, a compound represented by formula:



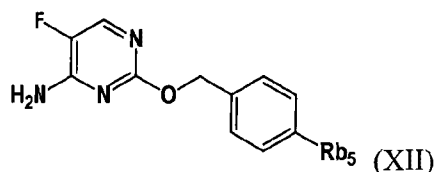
[0025] Further, in any one of the preferable embodiments described above, the compound (b-38) represented by general formula (VII):



15 is preferably a compound wherein Rb₁₀ is a chlorine atom, and Rb₁₁ is a nitrogen atom.

[0026] Further, in any one of the preferable embodiments described above, the

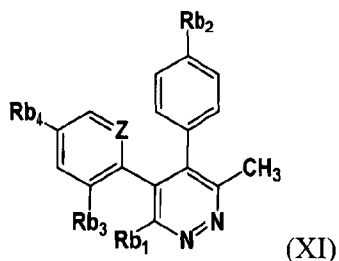
compound (b-86) represented by general formula (XII):



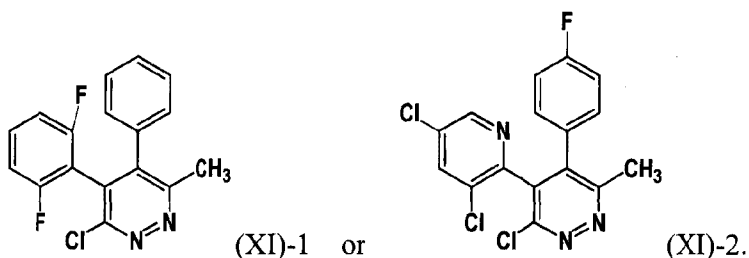
is preferably a compound wherein Rb₅ is a methyl group.

[0027] Further, in any one of the preferable embodiments described above, the

5 compound (b-85) represented by general formula (XI):

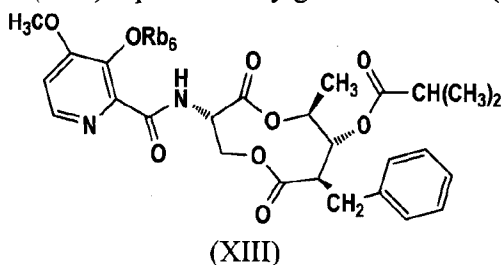


is preferably a compound represented by:



[0028] Further, in any one of the preferable embodiments described above, the

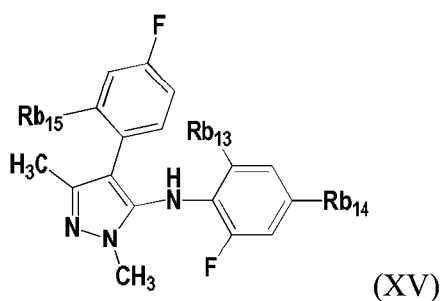
10 compound (b-87) represented by general formula (XIII)



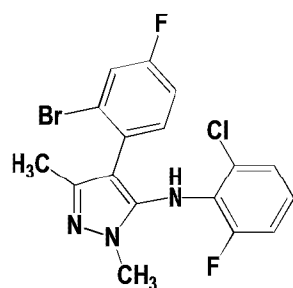
is preferably a compound wherein Rb₆ is -CH₂OC(O)CH(CH₃)₂.

[0029] Further, in any one of the preferable embodiments described above, the

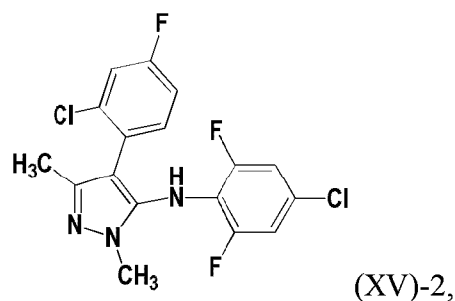
15 compound (b-89) represented by general formula (XV)



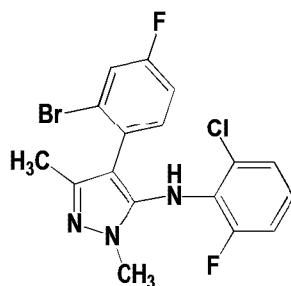
is preferably a compound represented by:



or

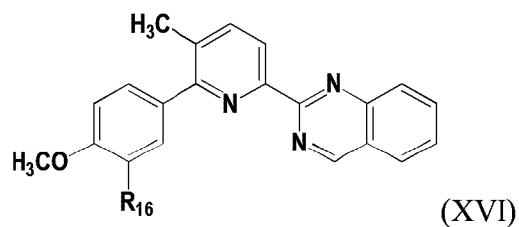


and more preferably a compound represented by:



5

[0030] Further, in any one of the preferable embodiments described above, the compound (b-90) represented by general formula (XVI):

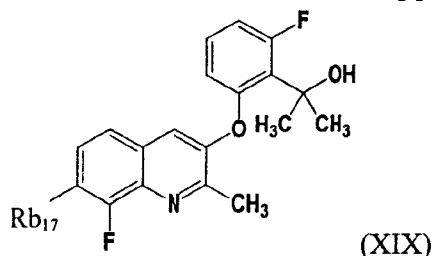


is preferably a compound wherein Rb₁₆ is a fluorine atom.

10 [0031] Further, in any one of the preferable embodiments described above, the compound (b-94) represented by general formula (XIX)

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is preferably a compound wherein Rb₁₇ represents a fluorine atom.

[0032] In one embodiment of the present invention, the fungicidal compounds used in combination with at least one quinoline compound represented by general formula (I) or

5 a salt thereof is preferably selected from the group consisting of:

- (b-4) Bixafen,
- (b-19) Pyraclostrobin,
- (b-23) Prothioconazole
- (b-26) Metconazole,
- 10 (b-29) Difenconazole,
- (b-33) Triadimenol,
- (b-43) Fluopyram,
- (b-46) Isotianil,
- (b-52) Dimoxystrobin,
- 15 (b-54) Metominostrobin,
- (b-55) Trifloxystrobin,
- (b-62) Pyrimethanil,
- (b-69) Propineb,
- (b-81) Dithianon,
- 20 (b-101) Spiroxamine and
- (b-105) Phosphorous acid.

[0033] The compounds of group b are known compounds that are produced according to, for example, the methods described in International Publication No. WO 2008/145740, International Publication No. WO 2011/015416, International Publication No. WO 2011/085170, International Publication No. WO 1995/027693, International Publication No. WO 2006/016708, International Publication No. WO 2003/016303, International Publication No. WO 2005/044813, International Publication No. WO 2007/000098, International Publication No. WO 2008/145052, International Publication No. WO 2006/125370, International Publication No. WO 2002/006304, International Publication No. WO 2007/072999, International Publication No. WO 1986/002641, International Publication No. WO

2007/066601, International Publication No. WO 2009/094442, International Publication No. WO 2001/014339, International Publication No. WO 2011/056463, International Publication No. WO 2012/031061, International Publication No. WO 2010/043319, International Publication No. WO 2010/136475, International Publication No. WO 2010/146006, International Publication No. WO 2012/019981, International Publication No. WO 2010/149414, International Publication No. WO 2011/070771, International Publication No. WO 2012/172061, International Publication No. WO 2010/094728, International Publication No. WO 2013/037717, International Publication No. WO 2002/012172, European Patent Publication No. 936213, U.S. Patent No. 7666884, or methods complying therewith.

[0034] The plant disease control composition of the present invention allows the obtaining of synergistic controlling effects in comparison with the case of using each of the active ingredients alone. The synergistic controlling effects and a degree thereof can be confirmed by using various test methods such as the method of Colby (see Colby SR, "Calculating Synergistic and Antagonistic Responses of Herbicide Combinations", Weed, 15, 1967, 20-22). This is currently a most efficacious method to determine a combination effect of two agents, and as described below in detail, during a comparison of a theoretical value calculated by Colby's formula with an actual measured effect (actual value), it is judged to be synergistic when the actual value is greater than the theoretical value, whereas to be antagonistic when the theoretical value is greater than the actual value. In the case the difference between an actual value and a theoretical value is larger, the synergistic effect is presumed to be higher. Thus, as a preferable embodiment of the present invention, there is provided a plant disease control composition comprising a combination of effective ingredients that exhibit a difference between an actual value and a theoretical value, of 5% or more, more preferably 10% or more, and still more preferably 20% or more.

[0035] Although the plant disease control composition in the present invention may be used as is, it is normally used by mixing with a carrier, and is used by formulating into a wettable powder (WP), suspension concentrate (SC), granule (GR), dustable powder (DP), soluble concentrate (SC), water dispersible granule (WG), or emulsion concentrate (EC) and the like at a suitable time according to commonly known methods by adding a formulation additive such as a dispersing agent, wetting agent, binder, thickener, preservative, colorant or stabilizer and the like as necessary. Other types of formulations known in the art are also applicable in the present invention. As used herein, the name of preparation (formulation) types and codes are essentially based on OECD Guidance Documents for Pesticide Registration

(<http://www.oecd.org/env/ehs/pesticides-biocides/oecdguidancedocumentsforpesticider egistration.htm>). The content of the active ingredient in the form of the quinoline compound (I: group a compound) in these preparations is normally a weight ratio within the range of 0.005% to 99%, preferably within the range of 0.1% to 90% and even more preferably within the range of 0.3% to 80%. In addition, the content of the active ingredient in the form of the fungicidal compound of group b in these preparations is normally a weight ratio within the range of 0.005% to 99%, preferably within the range of 0.1% to 90% and even more preferably within the range of 0.3% to 80%. The total of the quinoline compound (I: group a compound) and the fungicidal compound of group b is normally a weight ratio within the range of 0.01% to 99%, preferably within the range of 0.1% to 90% and even more preferably within the range of 0.3% to 80%. The mixing ratio between the quinoline compound (I: group a compound) and the fungicidal compound of group b is normally a weight ratio of the fungicidal compound of group b to the quinoline compound 1 of 0.01 to 1000 and preferably a weight ratio of the fungicidal compound of group b to the quinoline compound 1 of 0.01 to 500, more preferably 1 of 0.01 to 100, still more preferably 1 of 0.01 to 50 and most preferably 1 of 0.01 to 25. Within this range, it would be easy to find a most preferable mixing ratio of actually combined individual compounds. It would also be possible to speculate a preferable mixing ratio of similar combinations in terms of a mode of action or chemical structure of the fungicidal compound of group b, based on the measured combinations having synergistic effects.

[0036] In the plant disease control composition of the present invention, although varying according to the preparation form, the combined content of active ingredients in the form of the quinoline compound (I: group a compound) and the fungicidal compound of group b is normally 0.01% to 30% by weight in the case of a dustable powder, 0.1% to 80% by weight in the case of a wettable powder, 0.5% to 20% by weight in the case of a granule, 2% to 50% by weight in the case of an emulsion concentrate, 1% to 50% by weight in the case of a suspension concentrate, and 1% to 80% by weight in the case of a water dispersible granule. It is preferably 0.05 to 10% by weight in the dustable powder, 5 to 60% by weight in the wettable powder, 5 to 20% by weight in the emulsion concentrate, 5 to 50% by weight in the suspension concentrate, and 5 to 50% by weight in the water dispersible granule. The content of additives is 0% to 80% by weight, and the content of the carrier is the amount obtained by subtracting the total content of active ingredient compounds and additives from 100% by weight.

[0037] The carrier used in the aforementioned composition refers to a synthetic or

natural, inorganic or organic substance that is incorporated to aid in the delivery of active ingredients to a site to be treated or to facilitate storage, transport or handling of active ingredient compounds, can be used in the form of a solid or liquid provided it is used in ordinary agri-horticultural preparations, and there are no specific limitations thereon. Examples of solid carriers include inorganic substances such as bentonite, montmorillonite, kaolinite, diatomaceous earth, kaolin, talc, clay, vermiculite, gypsum, calcium carbonate, amorphous silica or ammonium sulfate, plant-based organic substances such as soybean powder, wood meal, sawdust, wheat flour, lactose, sucrose or glucose, and urea. Examples of liquid carriers include aromatic hydrocarbons and naphthenes such as toluene, xylene or cumene, paraffin-based hydrocarbons such as n-paraffin, iso-paraffin, liquid paraffin, kerosene, mineral oil or polybutene, ketones such as acetone or methyl ethyl ketone, ethers such as dioxane or diethylene glycol dimethyl ether, alcohols such as ethanol, propanol or ethylene glycol, carbonates such as ethylene carbonate, propylene carbonate or butylene carbonate, aprotic solvents such as dimethylformamide or dimethylsulfoxide, and water.

[0038] Moreover, additives can be respectively used either alone or in combination corresponding to the purpose and in consideration of such factors as preparation form and treatment method in order to enhance the efficacy of compounds contained in the composition of the present invention. Examples of additives in the form of surfactants normally used for the purpose of emulsifying, dispersing, spreading or wetting agricultural chemical preparations include nonionic surfactants such as sorbitan fatty acid esters, polyoxyethylene sorbitan fatty acid esters, sucrose fatty acid esters, polyoxyethylene fatty acid esters, polyoxyethylene resin acid esters, polyoxyethylene fatty acid diesters, polyoxyethylene castor oil, polyoxyethylene alkyl ethers, polyoxyethylene alkyl phenyl ethers, polyoxyethylene dialkyl phenyl ethers, formalin condensates of polyoxyethylene alkyl phenyl ethers, polyoxyethylene-polyoxypropylene block copolymers, alkyl polyoxyethylene-polyoxypropylene block polymer ethers, alkyl phenyl polyoxyethylene-polyoxypropylene block polymer ethers, polyoxyethylene alkyl amines, polyoxyethylene fatty acid amides, polyoxyethylene bisphenyl ethers, polyoxyalkylene benzyl phenyl ethers, polyoxyalkylene styryl phenyl ethers, polyoxyalkylene adducts of higher alcohols, polyoxyethylene ethers, ester-based silicone and fluorine-based surfactants; anionic surfactants such as alkyl sulfates, polyoxyethylene alkyl ether sulfates, polyoxyethylene alkyl phenyl ether sulfates, polyoxyethylene benzyl phenyl ether sulfates, polyoxyethylene styryl phenyl ether sulfates, polyoxyethylene-polyoxypropylene block polymer sulfates, paraffin sulfonates,

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alkane sulfonates, AOS, dialkyl sulfosuccinates, alkyl benzene sulfonates, naphthalene
 sulfonates, dialkyl naphthalene sulfonates, formalin condensates of naphthalene
 sulfonates, alkyl diphenyl ether disulfonates, lignin sulfonates, polyoxyethylene alkyl
 phenyl ether sulfonates, polyoxyethylene alkyl ether sulfosuccinate half esters, fatty
 5 acid salts, N-methyl-fatty acid sarcosinates, resin acid salts, polyoxyethylene alkyl ether
 phosphates, polyoxyethylene phenyl ether phosphates, polyoxyethylene dialkyl phenyl
 ether phosphates, polyoxyethylene benzylated phenyl ether phosphates,
 polyoxyethylene benzylated phenyl phenyl ether phosphates, polyoxyethylene
 styrylated phenyl ether phosphates, polyoxyethylene styrylated phenyl phenyl ether
 10 phosphates, polyoxyethylene-polyoxypropylene block polymer phosphates,
 phosphatidylcholine, phosphatidylethanolamine, alkyl phosphates or sodium
 tripolyphosphate ; polyanionic polymer surfactants derived from acrylic acid and
 acrylonitrile or acrylamidomethylpropane sulfonic acid; cationic surfactants such as
 alkyl trimethyl ammonium chlorides, methyl polyoxyethylene alkyl ammonium
 15 chlorides, alkyl-N-methyl pyridinium bromides, monomethylated ammonium chlorides,
 dialkyl methylated ammonium chlorides, alkyl pentamethyl propylene amine
 dichlorides, alkyl dimethyl benzalkonium chlorides or benzethonium chloride; and,
 amphoteric surfactants such as dialkyl diaminoethyl betaines or alkyl dimethyl benzyl
 betaines. Examples of binders used as additives include sodium alginate, polyvinyl
 20 alcohol, gum arabic, CMC sodium and bentonite, examples of disintegrating agents
 include CMC sodium and croscarmellose sodium, and examples of stabilizers include
 hindered phenol-based antioxidants and benzotriazole-based or hindered amine-based
 ultraviolet absorbers. Examples of pH adjusters include phosphoric acid, acetic acid
 and sodium hydroxide, and examples of antibacterial and antifungal agents include
 25 industrial disinfectants and antibacterial and antifungal agents such as
 1,2-benzisothiazolin-3-one. Examples of thickeners include xanthan gum, guar gum,
 CMC sodium, gum arabic, polyvinyl alcohol and montmorillonite. Examples of
 antifoaming agents include silicone-based compounds, and examples of antifreezing
 agents include propylene glycol and ethylene glycol. However, the additives are not
 30 limited to those listed above.

[0039] Although examples of methods used to apply the composition of the present
 invention include treatment by spraying the foliage of plant individuals, seedling box
 treatment, soil surface spraying, soil surface spraying followed by soil incorporation,
 soil injection, soil injection followed by soil incorporation, soil irrigation, soil irrigation
 35 followed by soil incorporation, plant seed spraying, plant seed smearing, plant seed
 immersion and plant seed powder coating, any type of application method routinely

used by persons with ordinary skill in the art demonstrates adequate efficacy.

[0040] In addition, the method for controlling plant disease in the present invention includes applying a plant disease control composition containing a compound of group a and a fungicidal compound of group b as active ingredients, simultaneously applying
5 a plant disease control composition containing a compound of group a as an active ingredient and a plant disease control composition containing a fungicidal compound of group b as an active ingredient, or applying one of either a plant disease control composition containing a compound of group a as an active ingredient or a plant disease control composition containing a fungicidal compound of group b as an active
10 ingredient followed by spraying the other composition, and the amount of time (time period) from applying one of either the plant disease control composition containing a compound of group a as an active ingredient or a plant disease control composition containing a fungicidal compound of group b as an active ingredient until spraying of the other composition is, for example, 1 minute to 2 weeks after applying either one of
15 the compositions, preferably 5 minutes to 1 week after applying either one of the compositions, and more preferably 10 minutes to 3 days after applying either one of the compositions.

[0041] Moreover, the plant disease control composition of the present invention can be prepared as a composition comprising high concentrations of the quinoline compound represented by general formula (I) and a fungicidal compound of group b. This highly
20 concentrated composition can be used as a spray by diluting with water. In addition, the plant disease control composition of the present invention can also be prepared as a mixture by mixing a composition containing a high concentration of the quinoline compound represented by general formula (I) and a composition containing a high
25 concentration of a fungicidal compound of group b at the time of use. This highly concentrated composition can be used as a spray by diluting with water (tank-mixing).

[0042] Although the applied amount and applied concentration of the plant disease control composition containing a quinoline compound of group a and a fungicidal compound of group b as active ingredients thereof vary according to such factors as the
30 target crop, target disease, degree of disease proliferation, compound drug form, application method and various environmental conditions, in the case of spraying, the applied amount is normally 10 g to 10,000 g per hectare and preferably 25 g to 5,000 g per hectare in terms of the amount of active ingredients. In addition, in the case of spraying after diluting a wettable powder, suspension concentrate or emulsion
35 concentrate with water, the dilution factor thereof is normally 5 to 50,000, preferably 10 to 20,000 and more preferably 15 to 10,000. In addition, in the case of seed

disinfection, the amount of the fungicide mixture used is normally 0.001 g to 50 g and preferably 0.01 g to 10 g per 1 kg of seeds. In the case of spraying the composition of the present invention onto the foliage of plant individuals, spraying onto the surface of soil, injecting into soil or irrigating soil drench, treatment may be carried out after
5 diluting the chemical ingredient used to a suitable concentration in a suitable carrier. In the case of contacting the composition of the present invention with plant seeds, the plant seeds may be immersed in the chemical ingredient as is. In addition, plant seeds may be immersed, powder-coated, sprayed or smeared after diluting the chemical ingredient used to a suitable concentration in a suitable carrier. Although the amount
10 of preparation used in the case of powder-coating, spraying or smearing is normally about 0.05% to 50% and preferably 0.1% to 30% of the dry weight of the plant seeds, the amount used is not limited thereto and can be varied according to the form of the preparation and the type of plant seeds targeted for treatment. Examples of suitable carriers include, but are not limited to, liquid carriers including water or organic
15 solvents such as ethanol;, and solid carriers in the manner of inorganic substances such as bentonite, montmorillonite, kaolinite, diatomaceous earth, kaolin, talc, clay, vermiculite, gypsum, calcium carbonate, amorphous silica or ammonium sulfate, plant-based organic substances such as soybean powder, wood meal, sawdust, wheat flour, lactose, sucrose or glucose, and urea.

[0043] Plant individuals as referred to in the present description refer to those that
20 thrive without moving by carrying out photosynthesis, and specific examples thereof include, but are not limited to, rice, wheat, barley, corn, grapes, apples, pears, peaches, cherries, persimmons, citrus fruits, soybeans, green beans, strawberries, potatoes, cabbages, lettuces, tomatoes, cucumbers, eggplants, watermelons, beets, spinaches, peas,
25 squashes, sugar canes, tobacco, green peppers, sweet potatoes, yams, konjac, rape, cotton, sunflowers, tulips, chrysanthemums and grasses.

[0044] Plant seeds as referred to in the present description refer to those used for agricultural propagation by storing nutrients for allowing the germination of seedlings, and specific examples thereof include, but are not limited to, corn, soybean, cotton, rice,
30 sugar beet, wheat, barley, sunflower, tomato, cucumber, eggplant, spinach, pea, squash, sugar cane, tobacco, green pepper and rape seeds, yam, potato, sweet potato and konjac seed tubers, edible lily and tulip bulbs, shallot seed bulbs, and seeds of plants created by genetic or other artificial manipulation, including soybeans, corn, rape seeds or cotton that do not inherently exist in nature and have been imparted with herbicide resistance,
35 rice or tobacco suitable for cold climates, and seeds of transformants of corn, cotton or potatoes that have been imparted with the ability to produce insecticides.

[0045] The composition of the present invention can naturally be used by mixing with other agricultural chemicals, soil conditioners or fertilizers such as insecticides, miticides, nematocides, fungicides, herbicides or plant growth regulators, and can be prepared by mixing therewith. Examples of insecticides, miticides and nematocides include, but are not limited to, pyrethroid-based compounds such as acrinathrin, allethrin [(1R)-isomer], bifenthrin, bioallethrin, bioallethrin S-cyclopentenyl isomer, bioresmethrin, cycloprothrin, cyfluthrin, beta-cyfluthrin, cyhalothrin, gamma-cyhalothrin, lambda-cyhalothrin, cypermethrin, alpha-cypermethrin, beta-cypermethrin, theta-cypermethrin, zeta-cypermethrin, cyphenothrin [(1R)-trans-isomer], deltamethrin, empenethrin [(EZ)-(1R)-isomer], esfenvalerate, etofenprox, fenpropathrin, fenvalerate, flucythrinate, flumethrin, tau-fluvalinate, halfenprox, imiprothrin, methothrin, metofluthrin, permethrin, phenothrin [(1R)-trans-isomer], prallethrin, resmethrin, RU15525 (kadethrin), silafluofen, tefluthrin, tetramethrin, tetramethrin [(1R)-isomer], tralomethrin, transfluthrin, ZXI8901, biopermethrin, furamethrin, profluthrin, flubrocycythrinate or dimefluthrin, organic phosphorous-based compounds such as acephate, azamethiphos, azinphos-methyl, azinphos-ethyl, cadusafos, chlorethoxyfos, chlorfenvinphos, chlormephos, chlorpyrifos, chlorpyrifos-methyl, coumaphos, CYAP (cyanophos), demeton-S-methyl, diazinon, ECP (dichlofenthion), DDVP (dichlorvos), dicrotophos, dimethoate, dimethylvinphos, disulfoton (ethylthiometon), EPN (O-ethyl-O-4-nitrophenyl phenylphosphonothioate), ethion, ethoprophos, famphur, fenamiphos, MEP (fenitrothion), MPP (fenthion), fosthiazate, heptenophos, isofenphos-methyl, isocarbophos (isopropyl O-(methoxyaminothio-phosphoryl)salicylate), isoxathion, malathion, mecarbam, methamidophos, DMTP (methidathion), mevinphos, monocrotophos, BRP (naled), omethoate, oxydemeton-methyl, parathion, parathion-methyl, PAP (phenthoate), phorate, phosalone, phosmet, phosphamidon, phoxim, pirimiphos-methyl, profenofos, propetamphos, prothiofos, pyraclofos, pyridaphenthion, quinalphos, sulfotep, tebupirimfos, temephos, terbufos, thiometon, triazophos, DEP (trichlorfon), vamidothion, Bayer 22/190 (chlorothion), bromfenvinfos, bromophos, bromophos-methyl, butathiofos, carbophenothion, chlorphoxim, sulprofos, diamidafos, CVMP (tetrachlorvinphos), propaphos, mesulfenfos, dioxabenzofos (salithion), etrimfos, oxydeprofos, formothion, fensulfothion, isazofos or imicyafos (AKD3088), oxime carbamate-based compounds such as alanycarb, butocarboxim, butoxycarboxim, thiodicarb or thiofanox, carbamate-based compounds such as aldicarb, bendiocarb, benfuracarb, NAC (carbaryl), carbofuran, carbosulfan, ethiofencarb, BPNC (fenobucarb), formetanate, furathiocarb, MIPC (isoprocab), methiocarb, methomyl,

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- oxamyl, pirimicarb, PHC (propoxur), trimethacarb, XMC, allyxycarb, aldoxycarb, bufencarb, butacarb, carbanolate, MTMC (metolcarb), MPMC (xylylcarb) or fenothiocarb, neonicotinoid-based compounds such as acetamiprid, clothianidin, dinotefuran, imidacloprid, nitenpyram, thiacloprid or thiamethoxam,
- 5 diacylhydrazine-based compounds such as chromafenozide, halofenozide, methoxyfenozide or tebufenozide, benzoylurea-based compounds such as bistrifluron, chlorfluazuron, diflubenzuron, flucycloxuron, flufenoxuron, hexaflumuron, lufenuron, novaluron, noviflumuron, teflubenzuron or triflumuron, juvenile hormone-based compounds such as fenoxycarb, hydroprene, kinoprene, methoprene or pyriproxyfen,
- 10 cyclodiene organochlorine-based compounds such as chlordane, endosulfan, lindane (gamma-HCH) or dienochlor, 2-dimethylaminopropane-1,3-dithiol-based compounds such as cartap hydrochloride or thiocyclam, amidine-based compounds such as amitraz, phenylpyrazole-based compounds such as ethiprole or fipronil, organic tin-based compounds such as azocyclotin, cyhexatin or fenbutatin oxide, METI-based compounds
- 15 such as fenazaquin, fenpyroximate, pyridaben, pyrimidifen, tebufenpyrad or tolfenpyrad, benzylate-based compounds such as bromopropylate, allyl pyrrole-based compounds such as chlorfenapyr, nitrophenol-based compounds such as DNOC, anthranilic diamide-based compounds such as chlorantraniliprole or cyantraniliprole, oxadiazine-based compounds such as indoxacarb, semicarbazone-based compounds
- 20 such as metaflumizone, tetrionic acid-based compounds such as spirodiclofen or spiromesifen, carbamoyl triazole-based compounds such as triazamate, tetrazine-based compounds such as diflovidazin, as well as abamectin, acequinocyl, azadirachtin, bensultap, benzoximate, bifenazate, buprofezin, CGA 50 439, chinomethionate, clofentezine, cryolite, cyromazine, dazomet, DCIP, DDT, diafenthiuron, D-D
- 25 (1,3-dichloropropane), dicofol, dicyclanil, dinobuton, dinocap, ENT 8184, etoxazole, flonicamid, fluacrypyrim, flubendiamide, GY-81 (peroxocarbonate), hexythiazox, hydramethylnon, hydrogen cyanide, methyl iodide, karanjin, MB-599 (verbutin), silver chloride, metam, methoxychlor, methyl isothiocyanate, milbemectin, pentachlorophenol, phosphine, piperonyl butoxide, polynactins, BPPS (propargite), pymetrozine, pyrethrin,
- 30 pyridalyl, rotenone, S421 (bis(2,3,3,3-tetrachloropropyl)ether), sabadilla, spinosad, sulcofuronic acid (sulcofuron-sodium), sulfluramid, tetradifon, thiosultap, tribufos, aldrin, amidithion, amidothioate, aminocarb, amiton, aramite, athidathion, azothoate, barium polysulfide, Bayer 22408, Bayer 32394, triflumezopyrim, benclothiaz,
- 35 5-(1,3-benzodioxol-5-yl)-3-hexylcyclohex-2-enone, 1,1-bis(4-chlorophenyl)-2-ethoxyethanol, butonate, butopyronoxyl, 2-(2-butoxyethoxy)ethyl thiocyanato, camphechlor, chlorbenside, chlordecone,

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chlordimeform, chlorfenethol, chlorfenson, isoprothiolane, fluazuron, lepimectin, spinetoram, emamectin benzoate, metaldehyde, phenisobromolate, bialaphos, levamisole hydrochloride, pyrifluquinazon (NNII0101), cyflumetofen, amidoflumet, IKA-2005, cyenopyrafen (NC512), spirotetramat (BYI08330), sulfoxaflo, pyrafluprole
 5 (V3039), pyriprole (V3086), tetraniliprole, cyclaniliprole, momfluorothrin, heptafluthrin, pyflubumide, flometoquin, fluensulfone, meperfluthrin, tetramethylfluthrin, kappa-bifenthrin, kappa-tefluthrin, dicloromezotiaz, flufiprole, tiozazafen, flupyradifurone, afidopyropen, fluhexafon and tralopyril.

[0046] The composition and control method of the present invention are effective
 10 against, for example, the types of plant diseases indicated below. The following indicates those specific diseases and pathogens thereof targeted for control by the present invention.

[0047] Examples thereof include, but are not limited to, blast (*Pyricularia oryzae*), sheath blight (*Thanatephorus cucumeris*, *Rhizoctonia solani*), brown spot
 15 (*Cochliobolus miyabeanus*), "Bakanae" disease (*Gibberella fujikuroi*), seedling blight (*Pythium* spp., *Fusarium* spp., *Trichoderma* spp., *Rhizopus* spp., *Rhizoctonia solani* etc.), false smut (*Claviceps virens*) and kernel smut (*Tilletia barclayana*) of rice; powdery mildew (*Erysiphe graminis* f.sp. *hordei*; f.sp. *tritici*), rust (*Puccinia striiformis*; *Puccinia graminis*, *Puccinia recondita*, *Puccinia hordei*), mottle leaf (*Pyrenophora*
 20 *graminea*), net blotch (*Pyrenophora teres*), fusarium blight (*Fusarium graminearum*, *Fusarium culmorum*, *Fusarium avenaceum*, *Microdochium nivale*), snow mould (*Typhula incarnata*, *Typhula ishikariensis*, *Micronectriella nivalis*), loose kernel smut (*Ustilago nuda*, *Ustilago tritici*, *Ustilago nigra*, *Ustilago avenae*), stinking smut (*Tilletia caries*, *Tilletia pancicii*), eye spot (*Pseudocercospora herpotrichoides*), foot
 25 rot (*Rhizoctonia cerealis*), scald (*Rhynchosporium secalis*), leaf blight (*Septoria tritici*), glume blotch (*Leptosphaeria nodorum*), seedling blight (*Fusarium* spp., *Pythium* spp., *Rhizoctonia* spp., *Septoria nodorum*, *Pyrenophora* spp.), damping off (*Gaeumannomyces graminis*), anthracnose (*Colletotrichum graminicola*), ergot (*Claviceps purpurea*) and spot blotch (*Cochliobolus sativus*) of family of wheat and barley; fusarium blight
 30 (*Fusarium graminearum* etc.), seedling blight (*Fusarium avenaceum*, *Penicillium* spp., *Pythium* spp., *Rhizoctonia* spp.), rust (*Puccinia sorghi*), brown spot (*Cochliobolus heterostrophus*), smut (*Ustilago maydis*), anthracnose (*Colletotrichum graminicola*) and Northern leaf spot (*Cochliobolus carbonum*) of corn; downy mildew (*Plasmopara viticola*), rust (*Phakopsora ampelopsidis*), powdery mildew (*Uncinula necator*),
 35 anthracnose (*Elsinoe ampelina*), ripe rot (*Glomerella cingulata*), black rot (*Guignardia bidwellii*), dead arm (*Phomopsis viticola*), fly speck (*Zygophiala jamaicensis*), gray

- mold (*Botrytis cinerea*), bud blight (*Diaporthe medusaea*), violet root rot (*Helicobasidium mompa*) and white root rot (*Rosellinia necatrix*) of grape vine; powdery mildew (*Podosphaera leucotricha*), scab (*Venturia inaequalis*), alternaria blotch (*Alternaria alternata* Apple pathotype), rust (*Gymnosporangium yamadae*),
- 5 blossom blight (*Monillia mali*), valsa canker (*Valsa ceratosperma*), ring rot (*Botryosphaeria berengeriana*), anthracnose (*Colletotrichum acutatum*), fly speck (*Zygophiala jamaicensis*), sooty blotch (*Gloeodes pomigena*), fruit spot (*Mycosphaerella pomi*), violet root rot (*Helicobasidium mompa*), white root rot (*Rosellinia necatrix*), diaporthe canker (*Phomopsis mali*, *Diaporthe tanakae*) and blotch
- 10 (*Diplocarpon mali*) of apple; pear black spot (*Alternaria alternata* Japanese pear pathotype), scab (*Venturia nashicola*), rust (*Gymnosporangium haraeaeum*), Physalospora canker (*Physalospora piricola*) and canker (*Diaporthe medusaea*, *Diaporthe eres*) of Japanese pear, phytophthora rot (*Phytophthora cactorum*) of European pear; scab (*Cladosporium carpophilum*), phomopsis rot (*Phomopsis sp.*),
- 15 phytophthora fruit rot (*Phytophthora sp.*) and anthracnose (*Gloeosporium laeticolor*) of peach; anthracnose (*Glomerella cingulata*), young-fruit rot (*Monilinia kusanoi*) and brown rot (*Monilinia fructicola*) of cherry; anthracnose (*Gloeosporium kaki*), angular leaf spot (*Cercospora kaki*; *Mycosphaerella nawae*), powdery mildew (*Phyllactinia kakikora*) of persimmon; melanose (*Diaporthe citri*), common green mold (*Penicillium digitatum*), blue mold (*Penicillium italicum*) and scab (*Elsinoe fawcettii*) of citrus;
- 20 [0048] gray mold (*Botrytis cinerea*) of tomato, cucumber, pulse, strawberry, potato, cabbage, eggplant, lettuce, etc.; stem rot (*Sclerotinia sclerotiorum*) of tomato, cucumber, bean, strawberry, potato, rape, cabbage, eggplant, lettuce, etc.; seedling blight (*Rhizoctonia spp.*, *Pythium spp.*, *Fusarium spp.*, *Phytophthora spp.*, *Sclerotinia*
- 25 *sclerotiorum etc.*) of various kinds of vegetables such as tomato, cucumber, bean, Japanese radish, water melon, eggplant, rape, green pepper, spinach, sugar beet, etc.; downy mildew (*Pseudoperonospora cubensis*), powdery mildew (*Sphaerotheca fuliginea*), anthracnose (*Colletotrichum lagenarium*), gummy stem blight (*Mycosphaerella melonis*), fusarium wilt (*Fusarium oxysporum*) and phytophthora rot
- 30 (*Phytophthora parasitica*, *Phytophthora melonis*, *Phytophthora nicotianae*, *Phytophthora drechsleri*, *Phytophthora capsici etc.*) of oriental melon; early blight (*Alternaria solani*), leaf mold (*Cladosporium fulvum*), late blight (*Phytophthora infestans*), fusarium wilt (*Fusarium oxysporum*), root rot (*Pythium myriotylum*, *Pythium dissotocum*) and anthracnose (*Colletotrichum phomoides*) of tomato; powdery mildew
- 35 (*Sphaerotheca fuliginea etc.*), leaf mold (*Mycovellosiella natrassii*), late blight (*Phytophthora infestans*) and brown rot (*Phytophthora capsici*) of eggplant; alternaria

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- leaf spot (*Alternaria brassicae*) of rapeseed, alternaria leaf spot (*Alternaria brassicae* etc.), white spot (*Cercospora brassicae*), blackleg (*Leptosphaeria maculans*), club root (*Plasmodiophora brassicae*) and downy mildew (*Peronospora brassicae*) of Brassica vegetables; foot rot (*Rhizoctonia solani*), yellows (*Fusarium oxysporum*) of
- 5 cabbage; bottom rot (*Rhizoctonia solani*) and yellows (*Verticillium dahliae*) of Chinese cabbage; rust (*Puccinia allii*), alternaria leaf spot (*Alternaria porri*), southern blight (*Sclerotium rolfii*) and white tip disease (*Phytophthora porri*) of welsh onion; purple stain (*Cercospora kikuchii*), sphaceloma scab (*Elsinoe glycines*), black spot (*Diaporthe phaseolorum*), rhizoctonia root rot (*Rhizoctonia solani*), stem rot
- 10 (*Phytophthora megasperma*), downy mildew (*Peronospora manshurica*), rust (*Phakopsora pachyrhizi*) and anthracnose (*Colletotrichum truncatum*) of soybean; anthracnose (*Colletotrichum lindemuthianum*) of kidney bean; leaf spot (*Mycosphaerella personatum*) and brown leaf spot (*Cercospora arachidicola*) of peanuts; powdery mildew (*Erysiphe pisi*) and downy mildew (*Peronospora pisi*) of pea;
- 15 downy mildew (*Peronospora viciae*) and phytophthora rot (*Phytophthora nicotianae*) of broad bean; early blight (*Alternaria solani*), black scurf (*Rhizoctonia solani*), late blight (*Phytophthora infestans*), silver scurf (*Spondylocadium atrovirens*), dry spot (*Fusarium oxysporum*, *Fusarium solani*) and powdery scab (*Spongospora subterranea*) of potato; cercospora leaf spot (*Cercospora beticola*), downy mildew (*Peronospora schachtii*),
- 20 aphanomyces root rot (*Aphanomyces cochlioides*) and leaf spot (*Phoma betae*) of sugar beet; leaf blight (*Alternaria dauci*) of carrots; powdery mildew (*Sphaerotheca humuli*), phytophthora rot (*Phytophthora nicotianae*), anthracnose (*Glomerella cingulata*) and soft-rotted fruits (*Pythium ultimum* Trow var. *ultimum*) of strawberry; net blister blight (*Exobasidium reticulatum*), white scab (*Elsinoe leucospila*),
- 25 anthracnose (*Colletotrichum theae-sinensis*) and gray blight (*Pestalotiopsis longiseta*) of green tea; brown spot (*Alternaria alternata* (Tobacco pathotype)), powdery mildew (*Erysiphe cichoracearum*), anthracnose (*Colletotrichum tabacum*) and black shank (*Phytophthora parasitica*) of tobacco; damping off (*Fusarium oxysporum*) of cotton; sclerotinia rot (*Sclerotinia sclerotiorum*) of sunflower; black spot (*Diplocarpon rosae*),
- 30 powdery mildew (*Sphaerotheca pannosa*), phytophthora rot (*Phytophthora megasperma*) and downy mildew (*Peronospora sparsa*) of rose; leaf blight (*Septoria chrysanthemi-indici*), rust (*Puccinia horiana*) and phytophthora rot (*Phytophthora cactorum*) of chrysanthemum; or brown patch (*Rhizoctonia solani*), dollar spot (*Sclerotinia homoeocarpa*), Curvularia
- 35 leaf blight (*Curvularia geniculata*), rust (*Puccinia zoysiae*), Helminthosporium leaf blight (*Cochliobolus* sp.), scald (*Rhynchosporium secalis*), damping off

- (*Gaeumannomyces graminis*), anthracnose (*Colletotrichum graminicola*), typhula brown snow blight (*Typhula incarnata*), typhula black snow blight (*Typhula ishikariensis*), sclerotinia snow blight (*Sclerotinia borealis*), fairy rings (*Marasmius oreades* etc.), pythium blight (*Pythium aphanidermatum* etc.) and blast (*Pyricularia oryzae*) of turf grass.
- [0049] More preferable targets for controlling plant diseases by the present invention are blast (*Pyricularia oryzae*,), brown spot (*Cochliobolus miyabeanus*), "Bakanae" disease (*Gibberella fujikuroi*), seedling blight (*Pythium* spp., *Fusarium* spp., *Trichoderma* spp., *Rhizopus* spp., *Rhizoctonia solani* etc.) and false smut (*Claviceps virens*) of rice; powdery mildew (*Erysiphe graminis* f.sp.*hordei*; f.sp.*tritici*), mottle leaf (*Pyrenophora graminea*), net blotch (*Pyrenophora teres*), fusarium blight (*Fusarium graminearum*, *Fusarium culmorum*, *Fusarium avenaceum*, *Microdochium nivale*), snow mould (*Typhula incarnata*, *Typhula ishikariensis*, *Micronectriella nivalis*), eye spot (*Pseudocercospora herpotrichoides*), foot rot (*Rhizoctonia cerealis*), scald (*Rhynchosporium secalis*), leaf blight (*Septoria tritici*), seedling blight (*Fusarium* spp., *Pythium* spp., *Rhizoctonia* spp., *Septoria nodorum*, *Pyrenophora* spp.), damping off (*Gaeumannomyces graminis*), anthracnose (*Colletotrichum graminicola*), ergot (*Claviceps purpurea*) and spot blotch (*Cochliobolus sativus*) of family of wheat and barley; fusarium blight (*Fusarium graminearum* etc.), seedling blight (*Fusarium avenaceum*, *Penicillium* spp., *Pythium* spp., *Rhizoctonia* spp.), brown spot (*Cochliobolus heterostrophus*) and Northern leaf spot (*Cochliobolus carbonum*) of corn; powdery mildew (*Uncinula necator*), anthracnose (*Elsinoe ampelina*), ripe rot (*Glomerella cingulata*), black rot (*Guignardia bidwellii*), dead arm (*Phomopsis viticola*), fly speck (*Zygophiala jamaicensis*), gray mold (*Botrytis cinerea*), bud blight (*Diaporthe medusaea*), violet root rot (*Helicobasidium mompa*) and white root rot (*Rosellinia necatrix*) of grape vine; powdery mildew (*Podosphaera leucotricha*), scab (*Venturia inaequalis*), alternaria blotch (*Alternaria alternata* Apple pathotype), blossom blight (*Monillia mali*), valsa canker (*Valsa ceratosperma*), ring rot (*Botryosphaeria berengeriana*), anthracnose (*Colletotrichum acutatum*), fly speck (*Zygophiala jamaicensis*), sooty blotch (*Gloeodes pomigena*), fruit spot (*Mycosphaerella pomi*), violet root rot (*Helicobasidium mompa*), white root rot (*Rosellinia necatrix*), diaporthe canker (*Phomopsis mali*, *Diaporthe tanakae*) and blotch (*Diplocarpon mali*) of apple; pear black spot (*Alternaria alternata* Japanese pear pathotype), scab (*Venturia nashicola*), Physalospora canker (*Physalospora piricola*) and canker (*Diaporthe medusaea*, *Diaporthe eres*) of Japanese pear, scab (*Cladosporium carpophilum*), phomopsis rot (*Phomopsis* sp.) and anthracnose (*Gloeosporium laeticolor*) of peach;

- anthracnose (*Glomerella cingulata*), young-fruit rot (*Monilinia kusanoi*) and brown rot (*Monilinia fructicola*) of cherry; anthracnose (*Gloeosporium kaki*), angular leaf spot (*Cercospora kaki*; *Mycosphaerella nawae*) and powdery mildew (*Phyllactinia kakikora*) of persimmon; melanose (*Diaporthe citri*), common green mold (*Penicillium digitatum*), blue mold (*Penicillium italicum*) and scab (*Elsinoe fawcettii*) of citrus;
- 5 [0050] gray mold (*Botrytis cinerea*) of tomato, cucumber, pulse, strawberry, potato, cabbage, eggplant, lettuce, etc.; stem rot (*Sclerotinia sclerotiorum*) of tomato, cucumber, bean, strawberry, potato, rape, cabbage, eggplant, lettuce, etc.; seedling blight (*Rhizoctonia spp.*, *Pythium spp.*, *Fusarium spp.*, *Phytophthora spp.*, *Sclerotinia sclerotiorum etc.*) of various kinds of vegetables such as tomato, cucumber, bean,
- 10 Japanese radish, water melon, eggplant, rape, green pepper, spinach, sugar beet, etc.; powdery mildew (*Sphaerotheca fuliginea*), anthracnose (*Colletotrichum lagenarium*), gummy stem blight (*Mycosphaerella melonis*) and fusarium wilt (*Fusarium oxysporum*) of oriental melon; early blight (*Alternaria solani*), leaf mold (*Cladosporium fulvum*,
- 15 fusarium wilt (*Fusarium oxysporum*) and anthracnose (*Colletotrichum phomoides*) of tomato; powdery mildew (*Sphaerotheca fuliginea etc.*), of eggplant; alternaria leaf spot (*Alternaria brassicae*) of rapeseed, alternaria leaf spot (*Alternaria brassicae etc.*), white spot (*Cercospora brassicae*), blackleg (*Leptosphaeria maculans*) of Brassica vegetables; yellows (*Fusarium oxysporum*) of cabbage; yellows (*Verticillium dahliae*)
- 20 of Chinese cabbage; alternaria leaf spot (*Alternaria porri*) of welsh onion; purple stain (*Cercospora kikuchii*), sphaceloma scab (*Elsinoe glycines*), black spot (*Diaporthe phaseolorum*) and anthracnose (*Colletotrichum truncatum*) of soybean; anthracnose (*Colletotrichum lindemuthianum*) of kidney bean; leaf spot (*Mycosphaerella personatum*) and brown leaf spot (*Cercospora arachidicola*) of peanuts; powdery
- 25 mildew (*Erysiphe pisi*) of pea; early blight (*Alternaria solani*) and silver scurf (*Spondylocadium atrovirens*), of potato; cercospora leaf spot (*Cercospora beticola*) and leaf spot (*Phoma betae*) of sugar beet; leaf blight (*Alternaria dauci*) of carrots; powdery mildew (*Sphaerotheca humuli*) and anthracnose (*Glomerella cingulata*) of strawberry; white scab (*Elsinoe leucospila*), anthracnose (*Colletotrichum theasinensis*)
- 30 and gray blight (*Pestalotiopsis longiseta*) of green tea; brown spot (*Alternaria alternata* (*Tobacco pathotype*)), powdery mildew (*Erysiphe cichoracearum*) and anthracnose (*Colletotrichum tabacum*) of tobacco; damping off (*Fusarium oxysporum*) of cotton; sclerotinia rot (*Sclerotinia sclerotiorum*) of sunflower; black spot (*Diplocarpon rosae*) and powdery mildew (*Sphaerotheca pannosa*) of rose; leaf blight (*Septoria chrysanthemi-indici*) of chrysanthemum; or
- 35 dollar spot (*Sclerotinia homoeocarpa*), Curvularia leaf blight (*Curvularia geniculata*),

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Helminthosporium leaf blight (*Cochliobolus sp.*), scald (*Rhynchosporium secalis*), damping off (*Gaeumannomyces graminis*), anthracnose (*Colletotrichum graminicola*), typhula brown snow blight (*Typhula incarnata*), typhula black snow blight (*Typhula ishikariensis*), sclerotinia snow blight (*Sclerotinia borealis*), fairy rings (*Marasmius oreades etc.*) and blast (*Pyricularia oryzae*) of turf grass.

EXAMPLES

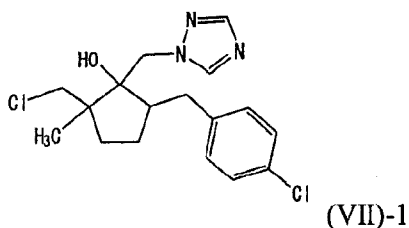
[0051] The following provides a more detailed explanation of the present invention by listing preparation examples and test examples thereof. However, the present invention is not limited to only these preparation examples and test examples. Furthermore, the number of parts of all incorporated amounts of each component described in the following preparation examples refers to parts by weight.

[0052] Compound A (a-14), B (a-18) and C (a-20) among the compounds (I: group a) used in the following preparation examples and test examples respectively refer to Compound Nos. 1-866, 1-929 and 1-930 of International Publication No. WO 2005/070917, and are respectively described therein in Examples 114, 177 and 178. The chemical structures thereof are shown in Table 1.

[0053] [Table 1]

Compound	R ¹	R ²	R ³	R ⁴	Xn	Ym
A(a-14)	Me	Me	Me	Me	5-F	H
B(a-18)	Me	Me	F	F	H	H
C(a-20)	Me	Me	F	F	5-F	H

[0054] In addition, the fungicidal compound of formula (VII)-1 of compound (b-38) used in the following preparation examples and test examples is a compound represented by the following formula.



[0055] Preparation Example 1 Wettable powder (WP) (a1)

Component I (group a) in the form of any of Compounds A, B and C (10, 1 or 0.01 parts), Component II (group b) in the form of any of the compounds described below (added amount indicated), Neogen powder (0.5 parts), Carplex (0.5 parts), Gohsenol (0.2 parts), Radiolite (0.8 parts) and H fine powder (used as the balance to bring to a total of 100 parts) were crushed and mixed to obtain wettable powder (a1).

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[0056] The compounds (added amounts) used for Component II (group b) consisted of (b-1) (2 parts), (b-2) (2 parts), (b-3) (2 parts), (b-4)(2 to 10 parts), (b-5) (2 to 50 parts), (b-6) (0.4 to 50 parts), (b-7) (0.4 to 50 parts), (b-8)(0.4 to 2 parts), (b-9)(0.4 to 2 parts), (b-16)(2 parts), (b-19)(2 parts), (b-20) (0.4 to 10 parts), (b-21) (0.4 to 10 parts), (b-22) 5 (0.4 to 10 parts), (b-23)(2 to 10 parts), (b-24) (0.4 to 10 parts), (b-25) (0.4 to 10 parts), (b-26) (0.4 to 10 parts), (b-27) (0.4 to 10 parts), (b-28) (0.4 to 10 parts), (b-29) (0.4 to 10 parts), (b-30) (0.4 to 10 parts), (b-31) (0.4 to 10 parts), (b-32) (0.4 to 10 parts), (b-33)(25 to 50 parts), (b-34) (0.4 to 10 parts), (b-35) (0.4 to 10 parts), (b-36) (0.4 to 10 parts), (b-38) (2 parts), (b-39) (0.4 parts), (b-40) (2 parts), (b-41) (50 parts), (b-42) (50 10 parts), (b-43)(2 to 10 parts), (b-44) (0.08 parts), (b-45) (10 parts), (b-46)(2 to 10 parts), (b-47) (10 parts), (b-49) (2 parts), (b-50) (2 parts), (b-51) (2 to 50 parts), (b-52) (2 to 50 parts), (b-53) (2 to 50 parts), (b-54)(2 parts), (b-55)(2 to 10 parts), (b-58) (10 to 50 parts), (b-59) (2 parts), (b-60) (10 to 50 parts), (b-61) (10 to 50 parts), (b-62)(10 to 50 parts), (b-63) (0.016 to 50 parts), (b-64) (10 parts), (b-65) (0.4 to 50 parts), (b-66) (0.4 15 to 50 parts), (b-67) (50 parts), (b-68) (50 parts), (b-69) (50 parts), (b-70) (50 parts), (b-71) (10 to 50 parts), (b-72)(2 to 10 parts), (b-73) (10 parts), (b-74) (0.4 to 50 parts), (b-75) (2 parts), (b-76) (25 parts), (b-77) (0.016 to 50 parts), (b-78) (0.4 parts), (b-81) (2 to 50 parts), (b-82) (0.08 to 50 parts), (b-83)(0.08 to 10 parts), (b-84)(0.0016 to 50 parts), (b-85)(10 parts), (b-88) (2 parts), (b-89)(2 parts), (b-91)(0.08 to 2 parts), 20 (b-92)(0.4 parts), (b-93) (50 parts), (b-94)(0.4 to 10 parts), (b-95) (2 parts), (b-96) (10 to 50 parts), (b-97) (0.08 parts), (b-98) (2 parts), (b-99) (10 to 50 parts), (b-100) (0.016 to 50 parts), (b-101) (0.4 to 50 parts), (b-102) (0.4 to 50 parts), (b-103) (10 to 50 parts), (b-104) (50 parts), (b-105) (25 to 50 parts), (b-106) (25 parts).

[0057] Preparation Example 2 Suspension concentrate (SC) (b1)

25 Component I (group a) in the form of any of Compounds A, B and C (10 or 1 parts), Component II (group b) in the form of any of the compounds described below (added amount indicated), propylene glycol (7 parts), sodium lignin sulfonate (4 parts), sodium dioctylsulfosuccinate (2 parts) and water (used as the balance to bring to a total of 100 parts) were wet-crushed with a sand grinder to obtain suspension concentrate 30 (b1).

[0058] The compounds (added amounts) used for Component II (group b) consisted of (b-1) (2 parts), (b-2) (2 parts), (b-3) (2 parts), (b-4)(2 to 10 parts), (b-5) (2 to 50 parts), (b-6) (0.4 to 50 parts), (b-7) (0.4 to 50 parts), (b-8)(0.4 to 2 parts), (b-9)(0.4 to 2 parts), (b-16)(2 parts), (b-19)(2 parts), (b-20) (0.4 to 10 parts), (b-21) (0.4 to 10 parts), (b-22) 35 (0.4 to 10 parts), (b-23)(2 to 10 parts), (b-24) (0.4 to 10 parts), (b-25) (0.4 to 10 parts), (b-26) (0.4 to 10 parts), (b-27) (0.4 to 10 parts), (b-28) (0.4 to 10 parts), (b-29) (0.4 to

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10 parts), (b-30) (0.4 to 10 parts), (b-31) (0.4 to 10 parts), (b-32) (0.4 to 10 parts),
 (b-33) (25 to 50 parts), (b-34) (0.4 to 10 parts), (b-35) (0.4 to 10 parts), (b-36) (0.4 to 10
 parts), (b-38) (2 parts), (b-39) (0.4 parts), (b-40) (2 parts), (b-41) (50 parts), (b-42) (50
 parts), (b-43) (2 to 10 parts), (b-44) (0.08 parts), (b-45) (10 parts), (b-46) (2 to 10 parts),
 5 (b-47) (10 parts), (b-49) (2 parts), (b-50) (2 parts), (b-51) (2 to 50 parts), (b-52) (2 to 50
 parts), (b-53) (2 to 50 parts), (b-54) (2 parts), (b-55) (2 to 10 parts), (b-58) (10 to 50
 parts), (b-59) (2 parts), (b-60) (10 to 50 parts), (b-61) (10 to 50 parts), (b-62) (10 to 50
 parts), (b-63) (0.016 to 50 parts), (b-64) (10 parts), (b-65) (0.4 to 50 parts), (b-66) (0.4
 to 50 parts), (b-67) (50 parts), (b-68) (50 parts), (b-69) (50 parts), (b-70) (50 parts),
 10 (b-71) (10 to 50 parts), (b-72) (2 to 10 parts), (b-73) (10 parts), (b-74) (0.4 to 50 parts),
 (b-75) (2 parts), (b-76) (25 parts), (b-77) (0.016 to 50 parts), (b-78) (0.4 parts), (b-81) (2
 to 50 parts), (b-82) (0.08 to 50 parts), (b-83) (0.08 to 10 parts), (b-84) (0.0016 to 50
 parts), (b-85) (10 parts), (b-88) (2 parts), (b-89) (2 parts), (b-91) (0.08 to 2 parts),
 (b-92) (0.4 parts), (b-94) (0.4 to 10 parts), (b-95) (2 parts), (b-96) (10 to 50 parts), (b-97)
 15 (0.08 parts), (b-98) (2 parts), (b-99) (10 to 50 parts), (b-100) (0.016 to 50 parts), (b-101)
 (0.4 to 50 parts), (b-102) (0.4 to 50 parts), (b-103) (10 to 50 parts), (b-104) (50 parts),
 (b-105) (25 to 50 parts), (b-106) (25 parts).

[0059] Preparation Example 3 Emulsion concentrate (EC) (c1)

Component I (group a) in the form of any of Compounds A, B and C (10 or 1
 20 parts), Component II (group b) in the form of any of the compounds described below
 (added amount indicated), cyclohexane (10 parts), Tween20 (surfactant, 20 parts) and
 xylene (used as the balance to bring to a total of 100 parts) were uniformly dissolved
 and mixed to obtain emulsion concentrate (c1).

[0060] The compounds (added amounts) used for Component II (group b) consisted of
 25 (b-1) (2 parts), (b-2) (2 parts), (b-3) (2 parts), (b-4) (2 to 10 parts), (b-5) (2 to 50 parts),
 (b-6) (0.4 to 50 parts), (b-7) (0.4 to 50 parts), (b-8) (0.4 to 2 parts), (b-9) (0.4 to 2 parts),
 (b-16) (2 parts), (b-19) (2 parts), (b-20) (0.4 to 10 parts), (b-21) (0.4 to 10 parts), (b-22)
 (0.4 to 10 parts), (b-23) (2 to 10 parts), (b-24) (0.4 to 10 parts), (b-25) (0.4 to 10 parts),
 (b-26) (0.4 to 10 parts), (b-27) (0.4 to 10 parts), (b-28) (0.4 to 10 parts), (b-29) (0.4 to
 30 10 parts), (b-30) (0.4 to 10 parts), (b-31) (0.4 to 10 parts), (b-32) (0.4 to 10 parts),
 (b-33) (25 to 50 parts), (b-34) (0.4 to 10 parts), (b-35) (0.4 to 10 parts), (b-36) (0.4 to 10
 parts), (b-38) (2 parts), (b-39) (0.4 parts), (b-40) (2 parts), (b-41) (50 parts), (b-42) (50
 parts), (b-43) (2 to 10 parts), (b-44) (0.08 parts), (b-45) (10 parts), (b-46) (2 to 10 parts),
 (b-47) (10 parts), (b-49) (2 parts), (b-50) (2 parts), (b-51) (2 to 50 parts), (b-52) (2 to 50
 35 parts), (b-53) (2 to 50 parts), (b-54) (2 parts), (b-55) (2 to 10 parts), (b-58) (10 to 50
 parts), (b-59) (2 parts), (b-60) (10 to 50 parts), (b-61) (10 to 50 parts), (b-62) (10 to 50

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parts), (b-63) (0.016 to 50 parts), (b-64) (10 parts), (b-65) (0.4 to 50 parts), (b-66) (0.4 to 50 parts), (b-67) (50 parts), (b-68) (50 parts), (b-69) (50 parts), (b-70) (50 parts), (b-71) (10 to 50 parts), (b-72) (2 to 10 parts), (b-73) (10 parts), (b-74) (0.4 to 50 parts), (b-75) (2 parts), (b-76) (25 parts), (b-77) (0.016 to 50 parts), (b-78) (0.4 parts), (b-81) (2 to 50 parts), (b-82) (0.08 to 50 parts), (b-83) (0.08 to 10 parts), (b-84) (0.0016 to 50 parts), (b-85) (10 parts), (b-88) (2 parts), (b-89) (2 parts), (b-91) (0.08 to 2 parts), (b-92) (0.4 parts), (b-94) (0.4 to 10 parts), (b-95) (2 parts), (b-96) (10 to 50 parts), (b-97) (0.08 parts), (b-98) (2 parts), (b-99) (10 to 50 parts), (b-100) (0.016 to 50 parts), (b-101) (0.4 to 50 parts), (b-102) (0.4 to 50 parts), (b-103) (10 to 50 parts), (b-104) (50 parts), (b-105) (25 to 50 parts), (b-106) (25 parts).

[0061] Comparative Preparation Example 1 Wettable powder (WP) (a2)

Water-dispersible powder (a2) was obtained using the same method as Preparation Example 1 with the exception of containing only one of either Component I (group a) or Component II (group b).

[0062] Comparative Preparation Example 2 Suspension concentrate (SC) (b2)

Suspension concentrate preparation (b2) was obtained using the same method as Preparation Example 2 with the exception of containing only one of either Component I (group a) or Component II (group b).

[0063] Comparative Preparation Example 3 Emulsion concentrate (EC) (c2)

Emulsion (c2) was obtained using the same method as Preparation Example 3 with the exception of containing only one of either Component I (group a) or Component II (group b).

[0064] Comparative Preparation Example 4 Wettable powder (WP) (a3)

Water-dispersible powder (a3) was obtained using the same method as Preparation Example 1 with the exception of containing Component II (group b) compounds described below in place of those used for Wettable powder (WP) (a1). The compounds (added amounts) used for Component II (group b) consisted of Dielocymet (0.4 to 50 parts), Carpropamid (0.4 to 50 parts), Tolclofos-methyl (10 to 50 parts), and Oxolinic acid (50 parts).

[0065] Test Example 1 Tomato Gray Mold Preventive Test

Tomato plants (variety: Ohgata Fukuju) planted in plastic pots having a diameter of 5 cm were grown indoors to the second to third leaf stage. Wettable powder prepared in compliance with Preparation Example 1 and Comparative Preparation Example 1 containing the compounds indicated in Table 2 were diluted with water to a prescribed concentration followed by spraying with a sprayer in 5 ml aliquots per 2 pots. After the chemical had dried, a conidia suspension of *Botrytis cinerea* which prepared

from previously cultured in PDA medium was inoculated by spraying onto the plants. Following inoculation, the pots were placed in the humidified chamber of an artificial inoculation room (25°C) and after 2 days, the pots were taken out and controlling effects were examined. During the examination, the percentage of affected area exhibiting lesions on a single tomato leaf was determined in accordance with the following incidence degree indicators. In addition, control values were calculated according to the equation indicated below from the average incidence degree of each treated group. The spray test results and theoretical values as determined according to Colby's formula are shown in Table 2.

10 [0066] Incidence Degree Indicators

Indicator	Incidence Degree
0	No lesions
0.5	Lesion area of about 1% to 2%
1	Lesion area of less than 5%
15 2	Lesion area of less than 25%
3	Lesion area of less than 50%
4	Lesion area of less than 75%
5	Lesion area of less than 95%
6	Lesion area of 95% or more or withered

20 Furthermore, the average values of each treated group and an untreated group were used for incidence degree.

[0067] Control values were calculated from the equation indicated below.

Control value = $(1 - \text{leaflet incidence rate of treated group} / \text{leaflet incidence rate of untreated group}) \times 100$

25 Furthermore, synergistic effects were evaluated using Colby's formula.

Colby's formula is expressed as $X = P + Q - P \times Q/100$, where X represents the theoretical value of the control value, P represents the control value in the case of spraying a certain chemical agent alone, and Q represents the control value in the case of spraying the chemical agent used in combination alone. In the case the actual measured effect is greater than the effect X as calculated with the aforementioned Colby's formula, the action resulting from combining two types of active ingredients is indicated to be more than additive, that is, to be synergistic.

[0068] [Table 2-1]

Effective ingredient in the preparation	Treatment concentration (ppm)	Control value	Theoretical value
A+ Compound of	10 + 2	93	64

formula (II) (b-3)			
A+ Picarbutrazox (b-78)	10 + 0.4	86	64
A+ Compound of formula (XIV) (b-88)	10 + 2	89	69
A+ Compound of formula (VII)-1 (b-38)	10 + 2	82	67
B+ Compound of formula (II) (b-3)	10 + 2	79	57
B+ Picarbutrazox (b-78)	10 + 0.4	86	57
B+ Compound of formula (XIV) (b-88)	10 + 2	79	63
B+ Compound of formula (VII)-1 (b-38)	10 + 2	82	60
C+ Compound of formula (II) (b-3)	10 + 2	79	57
C+ Picarbutrazox (b-78)	10 + 0.4	75	57
C+ Compound of formula (XIV) (b-88)	10 + 2	82	63
C+ Compound of formula (VII)-1 (b-38)	10 + 2	82	60
Compound of formula (II) (b-3)	2	0	
Picarbutrazox (b-78)	0.4	0	
Compound of formula (XIV) (b-88)	2	14	
Compound of formula (VII)-1 (b-38)	2	7	
A	10	64	
B	10	57	
C	10	57	

[0069] [Table 2-2]

Effective ingredient in the preparation	Treatment concentration (ppm)	Preventive value	Theoretical value
A+ Fluoxastrobin (b-51)	10 + 50	97	86
A+ Dimoxystrobin (b-52)	10 + 50	97	81
A+ Orysastrobin (b-53)	10 + 50	100	88
B+ Fluoxastrobin (b-51)	10 + 50	100	86
B+ Dimoxystrobin (b-52)	10 + 50	97	81
B+ Orysastrobin (b-53)	10 + 50	100	88
C+ Fluoxastrobin (b-51)	10 + 50	97	84
C+ Dimoxystrobin (b-52)	10 + 50	97	78
C+ Orysastrobin (b-53)	10 + 50	100	86
Fluoxastrobin (b-51)	50	40	
Dimoxystrobin (b-52)	50	17	
Orysastrobin (b-53)	50	47	

A	10	77
B	10	77
C	10	73

[0070] [Table 2-3]

Effective ingredient in the preparation	Treatment concentration (ppm)	Preventive value	Theoretical value
A+ Carboxin (b-41)	10 + 50	97	75
A+ Thifluzamide (b-42)	10 + 50	100	77
A+ Isopyrazam (b-7)	10 + 50	100	82
A+ Sedaxane (b-6)	10 + 50	97	85
A+ Penflufen (b-5)	10 + 50	100	84
A+ Cyprodinil (b-61)	10 + 50	97	85
A+ Fenpyrazamine (b-99)	10 + 10	97	84
B+ Carboxin (b-41)	10 + 50	97	75
B+ Thifluzamide (b-42)	10 + 50	97	77
B+ Isopyrazam (b-7)	10 + 50	97	82
B+ Sedaxane (b-6)	10 + 50	100	85
B+ Penflufen (b-5)	10 + 50	100	84
B+ Cyprodinil (b-61)	10 + 50	100	85
B+ Fenpyrazamine (b-99)	10 + 10	97	84
C+ Carboxin (b-41)	10 + 50	100	67
C+ Thifluzamide (b-42)	10 + 50	100	69
C+ Isopyrazam (b-7)	10 + 50	97	76
C+ Sedaxane (b-6)	10 + 50	100	80
C+ Penflufen (b-5)	10 + 50	97	79
C+ Cyprodinil (b-61)	10 + 50	97	80
C+ Fenpyrazamine (b-99)	10 + 10	97	79
Carboxin (b-41)	50	17	
Thifluzamide (b-42)	50	23	
Isopyrazam (b-7)	50	40	
Sedaxane (b-6)	50	50	
Penflufen (b-5)	50	47	
Cyprodinil (b-61)	50	50	
Fenpyrazamine (b-99)	10	47	
A	10	70	
B	10	70	
C	10	60	

[0071] [Table 2-4]

Effective ingredient in the preparation	Treatment concentration (ppm)	Preventive value	Theoretical value
A+ Tetraconazole (b-22)	10 + 10	97	84
A+ Epoxiconazole (b-24)	10 + 10	100	82
A+ Ipconazole (b-25)	10 + 10	100	84

A+ Metconazole (b-26)	10 + 10	97	84
A+ Propiconazole (b-27)	10 + 10	100	82
A+ Cyproconazole (b-28)	10 + 10	100	82
A+ Difenconazole (b-29)	10 + 10	97	84
A+ Fluquinconazole (b-30)	10 + 10	100	84
A+ Flusilazole (b-31)	10 + 10	100	82
A+ Penconazole(b-32)	10 + 10	97	78
A+ Flutriafol (b-34)	10 + 10	97	82
A+ Myclobutanil (b-35)	10 + 10	100	82
A+ Imazalil (b-20)	10 + 10	100	78
A+ Prochloraz(b-21)	10 + 10	100	78
B+ Tetraconazole (b-22)	10 + 10	100	84
B+ Epoxiconazole (b-24)	10 + 10	100	82
B+ Ipconazole (b-25)	10 + 10	97	84
B+ Metconazole (b-26)	10 + 10	100	84
B+ Propiconazole (b-27)	10 + 10	100	82
B+ Cyproconazole (b-28)	10 + 10	100	78
B+ Difenconazole (b-29)	10 + 10	97	82
B+ Fluquinconazole (b-30)	10 + 10	97	82
B+ Flusilazole (b-31)	10 + 10	100	78
B+ Penconazole(b-32)	10 + 10	100	78
B+ Flutriafol (b-34)	10 + 10	100	82
B+ Myclobutanil (b-35)	10 + 10	100	78
B+ Imazalil (b-20)	10 + 10	97	78
B+ Prochloraz(b-21)	10 + 10	100	78
C+ Tetraconazole (b-22)	10 + 10	100	82
C+ Epoxiconazole (b-24)	10 + 10	100	80
C+ Ipconazole (b-25)	10 + 10	100	82
C+ Metconazole (b-26)	10 + 10	100	82
C+ Propiconazole (b-27)	10 + 10	97	80
C+ Cyproconazole (b-28)	10 + 10	97	75
C+ Difenconazole (b-29)	10 + 10	97	80
C+ Fluquinconazole (b-30)	10 + 10	100	80
C+ Flusilazole (b-31)	10 + 10	97	75
C+ Penconazole(b-32)	10 + 10	100	75
C+ Flutriafol (b-34)	10 + 10	100	80
C+ Myclobutanil (b-35)	10 + 10	100	75
C+ Imazalil (b-20)	10 + 10	97	75
C+ Prochloraz(b-21)	10 + 10	97	75
Tetraconazole (b-22)	10	40	
Epoxiconazole (b-24)	10	33	
Ipconazole (b-25)	10	40	
Metconazole (b-26)	10	40	
Propiconazole (b-27)	10	33	
Cyproconazole (b-28)	10	17	
Difenconazole (b-29)	10	33	
Fluquinconazole (b-30)	10	33	

Flusilazole (b-31)	10	17
Penconazole(b-32)	10	17
Flutriafol (b-34)	10	33
Myclobutanil (b-35)	10	17
Imazalil (b-20)	10	17
Prochloraz(b-21)	10	17
A	10	73
B	10	73
C	10	70

[0072] [Table 2-5]

Effective ingredient in the preparation	Treatment concentration (ppm)	Preventive value	Theoretical value
A+ Thiabendazole (b-60)	10 + 50	100	87
A+ Benomyl (b-58)	10 + 50	100	88
A+ Thiuram (b-68)	10 + 50	100	90
A+ Metiram (b-67)	10 + 50	100	90
A+ Folpet (b-70)	10 + 50	100	92
A+ Pyrisoxazole (b-103)	10 + 10	100	82
B+ Thiabendazole (b-60)	10 + 50	100	87
B+ Benomyl (b-58)	10 + 50	100	88
B+ Thiuram (b-68)	10 + 50	100	90
B+ Metiram (b-67)	10 + 50	100	90
B+ Folpet (b-70)	10 + 50	100	92
R+ Pyrisoxazole (b-103)	10 + 10	97	82
C+ Thiabendazole (b-60)	10 + 50	100	87
C+ Benomyl (b-58)	10 + 50	100	88
C+ Thiuram (b-68)	10 + 50	100	90
C+ Metiram (b-67)	10 + 50	100	90
C+ Folpet (b-70)	10 + 50	100	92
C+ Pyrisoxazole (b-103)	10 + 10	97	82
Thiabendazole (b-60)	50	57	
Benomyl (b-58)	50	60	
Thiuram (b-68)	50	67	
Metiram (b-67)	50	67	
Folpet (b-70)	50	73	
Pyrisoxazole (b-103)	10	40	
A	10	70	
B	10	70	
C	10	70	

[0073] [Table 2-6]

Effective ingredient in the preparation	Treatment concentration (ppm)	Preventive value	Theoretical value
A+ Fenpropimorph (b-65)	10 + 50	97	78

A+ Tridemorph (b-66)	10 + 50	100	78
A+ Metrafenone (b-82)	10 + 50	100	73
A+ Quinoxifen (b-63)	10 + 50	100	78
A+ Flutianil (b-77)	10 + 50	100	78
A+ Proquinazid (b-100)	10 + 50	100	78
A+ Spiroxamine (b-101)	10 + 50	100	78
A+ Fenpropidin (b-102)	10 + 50	100	78
A+ Sulfur (b-96)	10 + 50	100	73
A+ Chinomethionat (b-74)	10 + 50	100	78
B+ Fenpropimorph (b-65)	10 + 50	100	83
B+ Tridemorph (b-66)	10 + 50	100	83
B+ Metrafenone (b-82)	10 + 50	97	80
B+ Quinoxifen (b-63)	10 + 50	100	83
B+ Flutianil (b-77)	10 + 50	100	83
B+ Proquinazid (b-100)	10 + 50	100	83
B+ Spiroxamine (b-101)	10 + 50	100	83
B+ Fenpropidin (b-102)	10 + 50	100	83
B+ Sulfur (b-96)	10 + 50	97	80
B+ Chinomethionat (b-74)	10 + 50	100	83
C+ Fenpropimorph (b-65)	10 + 50	100	81
C+ Tridemorph (b-66)	10 + 50	100	81
C+ Metrafenone (b-82)	10 + 50	100	77
C+ Quinoxifen (b-63)	10 + 50	100	81
C+ Flutianil (b-77)	10 + 50	100	81
C+ Proquinazid (b-100)	10 + 50	97	81
C+ Spiroxamine (b-101)	10 + 50	100	81
C+ Fenpropidin (b-102)	10 + 50	97	81
C+ Sulfur (b-96)	10 + 50	100	77
C+ Chinomethionat (b-74)	10 + 50	100	81
Fenpropimorph (b-65)	50	17	
Tridemorph (b-66)	50	17	
Metrafenone (b-82)	50	0	
Quinoxifen (b-63)	50	17	
Flutianil (b-77)	50	17	
Proquinazid (b-100)	50	17	
Spiroxamine (b-101)	50	17	
Fenpropidin (b-102)	50	17	
Sulfur (b-96)	50	0	
Chinomethionat (b-74)	50	17	
A	10	73	
B	10	80	
C	10	77	

[0074] [Table 2-7]

Effective ingredient in the preparation	Treatment concentration (ppm)	Preventive value	Theoretical value
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A+ Trifloxystrobin (b-55)	10 + 10	100	78
A+ Bixafen (b-4)	10 + 2	100	78
A+ Fluopyram (b-43)	10 + 2	97	80
A+ Prothioconazole (b-23)	10 + 2	97	78
A+ Triadimenol (b-33)	10 + 50	97	72
A+ Pyrimethanil (b-62)	10 + 10	97	78
A+ Dithianon (b-81)	10 + 50	100	78
B+ Trifloxystrobin (b-55)	10 + 10	97	78
B+ Bixafen (b-4)	10 + 2	100	78
B+ Fluopyram (b-43)	10 + 2	97	80
B+ Prothioconazole (b-23)	10 + 2	100	78
B+ Triadimenol (b-33)	10 + 50	100	72
B+ Pyrimethanil (b-62)	10 + 10	100	78
B+ Dithianon (b-81)	10 + 50	97	78
C+ Trifloxystrobin (b-55)	10 + 10	100	78
C+ Bixafen (b-4)	10 + 2	97	78
C+ Fluopyram (b-43)	10 + 2	100	80
C+ Prothioconazole (b-23)	10 + 2	97	78
C+ Triadimenol (b-33)	10 + 50	100	72
C+ Pyrimethanil (b-62)	10 + 10	100	78
C+ Dithianon (b-81)	10 + 50	97	78
Trifloxystrobin (b-55)	10	33	
Bixafen (b-4)	2	33	
Fluopyram (b-43)	2	40	
Prothioconazole (b-23)	2	33	
Triadimenol (b-33)	50	17	
Pyrimethanil (b-62)	10	33	
Dithianon (b-81)	50	33	
A	10	67	
B	10	67	
C	10	67	

[0075] [Table 2-8]

Effective ingredient in the preparation	Treatment concentration (ppm)	Preventive value	Theoretical value
A+ Pyriofenone (b-83)	10 + 10	97	78
A+Compound of formula (XV)-1 (b-89)	10 + 2	100	80
A+ Oxathiapiprolin (b-84)	10 + 50	97	78
A+ Compound of formula (XIX) (b-94)	10 + 0.4	100	80
A+ Compound of formula (XVII) (b-91)	10 + 2	100	80
A+ Compound of formula (III) (b-8)	10 + 2	100	80

A+ Compound of formula (IV) (b-9)	10 + 2	100	80
A+ Fluxapyroxad (b-1)	10 + 2	100	78
A+ Benzovindiflupyr (b-2)	10 + 2	97	80
A+ Carbendazim (b-59)	10 + 2	100	80
A+ Pyribencarb (b-98)	10 + 2	97	80
A+ Pyraziflumid (b-49)	10 + 2	97	80
B+ Pyriofenone (b-83)	10 + 10	93	78
B+ Compound of formula (XV)-1 (b-89)	10 + 2	100	80
B+ Oxathiapiprolin (b-84)	10 + 50	100	78
B+ Compound of formula (XIX) (b-94)	10 + 0.4	97	80
B+ Compound of formula (XVII) (b-91)	10 + 2	100	80
B+ Compound of formula (III) (b-8)	10 + 2	100	80
B+ Compound of formula (IV) (b-9)	10 + 2	97	80
B+ Fluxapyroxad (b-1)	10 + 2	97	78
B+ Benzovindiflupyr (b-2)	10 + 2	97	80
B+ Carbendazim (b-59)	10 + 2	100	80
B+ Pyribencarb (b-98)	10 + 2	100	80
B+ Pyraziflumid (b-49)	10 + 2	97	80
C+ Pyriofenone (b-83)	10 + 10	100	80
C+ Compound of formula (XV)-1 (b-89)	10 + 2	100	82
C+ Oxathiapiprolin (b-84)	10 + 50	97	80
C+ Compound of formula (XIX) (b-94)	10 + 0.4	100	82
C+ Compound of formula (XVII) (b-91)	10 + 2	100	82
C+ Compound of formula (III) (b-8)	10 + 2	100	82
C+ Compound of formula (IV) (b-9)	10 + 2	100	82
C+ Fluxapyroxad (b-1)	10 + 2	100	80
C+ Benzovindiflupyr (b-2)	10 + 2	100	82
C+ Carbendazim (b-59)	10 + 2	100	82
C+ Pyribencarb (b-98)	10 + 2	97	82
C+ Pyraziflumid (b-49)	10 + 2	97	82
Pyriofenone (b-83)	10	33	
Compound of formula (XV)-1 (b-89)	2	40	
Oxathiapiprolin (b-84)	50	33	
Compound of formula (XIX) (b-94)	0.4	40	

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Compound of formula (XVII) (b-91)	2	40
Compound of formula (III) (b-8)	2	40
Compound of formula (IV) (b-9)	2	40
Fluxapyroxad (b-1)	2	33
Benzovindiflupyr (b-2)	2	40
Carbendazim (b-59)	2	40
Pyribencarb (b-98)	2	40
Pyraziflumid (b-49)	2	40
A	10	40
B	10	40
C	10	40

[0076] [Table 2-9]

Effective ingredient in the preparation	Treatment concentration (ppm)	Preventive value	Theoretical value
A+ Phosphorous acid (b-105)	10 + 250	93	82
A+ Propineb (b-69)	10 + 50	93	82
A+ Compound of (V) (b-36)	10 + 10	100	84
A+ Compound of (XIV) (b-88)	10 + 0.4	97	87
A+ Compound of (XI)-1 (b-85)	10 + 10	97	87
A+ Compound of (XI)-2 (b-85)	10 + 10	97	87
A+ Compound of (XVIII) (b-92)	10 + 0.4	97	87
A+ D-tagatose (b-93)	10 + 5000	93	82
B+ Phosphorous acid (b-105)	10 + 250	97	82
B+ Propineb (b-69)	10 + 50	97	82
B+ Compound of (V) (b-36)	10 + 10	100	84
B+ Compound of (XIV) (b-88)	10 + 0.4	97	87
B+ Compound of (XI)-1 (b-85)	10 + 10	97	87
B+ Compound of (XI)-2 (b-85)	10 + 10	97	87
B+ Compound of (XVIII) (b-92)	10 + 0.4	97	87
B+ D-tagatose (b-93)	10 + 5000	93	82
C+ Phosphorous acid (b-105)	10 + 250	93	82
C+ Propineb (b-69)	10 + 50	93	82
C+ Compound of (V) (b-36)	10 + 10	97	84
C+ Compound of (XIV) (b-88)	10 + 0.4	97	87
C+ Compound of (XI)-1 (b-85)	10 + 10	97	87

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C+ Compound of (XI)-2 (b-85)	10 + 10	97	87
C+ Compound of (XVIII) (b-92)	10 + 0.4	93	87
C+ D-tagatose (b-93)	10 + 5000	93	82
Phosphorous acid (b-105)	250	33	
Propineb (b-69)	50	33	
Compound of (V) (b-36)	10	40	
Compound of (XIV) (b-88)	0.4	50	
Compound of (XI)-1 (b-85)	10	50	
Compound of (XI)-2 (b-85)	10	50	
Compound of (XVIII) (b-92)	0.4	50	
D-tagatose (b-93)	5000	33	
A	10	73	
B	10	73	
C	10	73	

- [0077] Based on the results shown in Tables 2-1 to 2-9 above, synergistic effects were determined to be obtained when Compound A, Compound B or Compound C is used in combination with a compound of group b. Furthermore, there were no symptoms of chemical damage observed on the plant bodies or tomatoes (variety: Ohgata Fukuju) even when Compound A, Compound B or Compound C was used in combination with a compound of group b.

[0078] Comparative Example 1 Tomato Gray Mold Preventive Test

- Wettable powder prepared in compliance with Comparative Preparation Example 4 containing the compounds indicated in Table 2-10 were sprayed to the tomato leaves, a conidia suspension of *Botrytis cinerea* was inoculated onto the plants, and the controlling effects were examined in a manner similar to Test Example 1. The results and theoretical values as determined according to Colby's formula are shown in Table 2-10.

[0079] [Table 2-10]

Effective ingredient in the preparation	Treatment concentration (ppm)	Preventive value	Theoretical value
A+ Diclocymet	10 + 50	60	72
A+ Carpropamid	10 + 50	67	72
A+ Tolclofos-methyl	10 + 50	67	72
A+ Oxolinic acid	10 + 50	60	72

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B+ Diclocymet	10 + 50	67	72
B+ Carpropamid	10 + 50	67	72
B+ Tolclofos-methyl	10 + 50	60	72
B+ Oxolinic acid	10 + 50	60	72
C+ Diclocymet	10 + 50	60	72
C+ Carpropamid	10 + 50	60	72
C+ Tolclofos-methyl	10 + 50	60	72
C+ Oxolinic acid	10 + 50	63	72
Diclocymet	50	17	
Carpropamid	50	17	
Tolclofos-methyl	50	17	
Oxolinic acid	50	17	
A	10	67	
B	10	67	
C	10	67	

[0080] Based on the results shown in Tables 2-10 above, even if these compounds are used in combination with Compound A, Compound B or Compound C, the controlling effects were under their theoretical values and the action resulting from combining two types of active ingredients is indicated to be antagonistic.

5 [0081] Test Example 2 Rice Blast Preventive Test

- Rice plants (variety: Sachikaze) planted in plastic pots having a diameter of 5 cm were grown indoors to the third to fourth leaf stage. Wettable powder containing the compounds indicated in Table 3 were sprayed in the same manner as in Test Example 1, and after the chemical had dried, a conidia suspension prepared from
- 10 *Pyricularia oryzae* which had been previously cultured in oatmeal medium was inoculated by spraying onto the plants. Following inoculation, the pots were placed in the humidified chamber of an artificial inoculation room (20°C to 23°C), and taken out on the next day and then transferred to a greenhouse. Control effects were examined 7
- 15 days after inoculation. During the examination, the number of lesions on the rice per pot was determined in accordance with the following incidence degree indicators, and control values and theoretical values as determined according to Colby's formula were calculated in the same manner as in Test Example 1. The results are shown in Tables 3-1 to 3-3.

[0082] Indicator Incidence Degree

- 20.
- | | |
|-----|------------------|
| 0 | No lesions |
| 0.5 | 1 to 2 lesions |
| 1 | 3 to 5 lesions |
| 2 | 6 to 10 lesions |
| 3 | 11 to 20 lesions |

4	21 to 30 lesions
5	31 to 40 lesions
6	41 or more lesions or withered

[0083] [Table 3-1]

Effective ingredient in the preparation	Treatment concentration (ppm)	Control value	Theoretical value
A+ Fluxapyroxad (b-1)	10 + 2	83	72
A+ Compound of formula (II) (b-3)	10 + 2	92	72
A+ Isofetamid (b-47)	10 + 10	83	72
A+ Picarbutrazox (b-78)	10 + 0.4	83	72
A+ Pyraziflumid (b-49)	10 + 2	83	72
A+ Compound of formula (XIV) (b-88)	10 + 2	92	83
A+ Compound of formula (VII)-1 (b-38)	10 + 2	92	83
B+ Fluxapyroxad (b-1)	10 + 2	92	72
B+ Compound of formula (II) (b-3)	10 + 2	92	72
B+ Isofetamid (b-47)	10 + 10	92	72
B+ Picarbutrazox (b-78)	10 + 0.4	83	72
B+ Pyraziflumid (b-49)	10 + 2	83	72
B+ Compound of formula (XIV) (b-88)	10 + 2	100	83
B+ Compound of formula (VII)-1 (b-38)	10 + 2	100	83
C+ Fluxapyroxad (b-1)	10 + 2	92	72
C+ Compound of formula (II) (b-3)	10 + 2	92	72
C+ Isofetamid (b-47)	10 + 10	92	72
C+ Picarbutrazox (b-78)	10 + 0.4	83	72
C+ Pyraziflumid (b-49)	10 + 2	92	72
C+ Compound of formula (XIV) (b-88)	10 + 2	100	83
C+ Compound of formula (VII)-1 (b-38)	10 + 2	100	83
Fluxapyroxad (b-1)	2	17	
Compound of formula (II) (b-3)	2	17	

Isofetamid (b-47)	10	17
Picarbutrazox (b-78)	0.4	17
Pyraziflumid (b-49)	2	17
Compound of formula (XIV) (b-88)	2	50
Compound of formula (VII)-1 (b-38)	2	50
A	10	67
B	10	67
C	10	67

[0084] [Table 3-2]

Effective ingredient in the preparation	Treatment concentration (ppm)	Preventive value	Theoretical value
A+ Fluoxastrobin (b-51)	10 + 10	97	89
A+ Dimoxystrobin (b-52)	10 + 10	100	93
A+ Orysastrobin (b-53)	10 + 10	100	89
B+ Fluoxastrobin (b-51)	10 + 10	100	89
B+ Dimoxystrobin (b-52)	10 + 10	100	93
B+ Orysastrobin (b-53)	10 + 10	100	89
C+ Fluoxastrobin (b-51)	10 + 10	97	89
C+ Dimoxystrobin (b-52)	10 + 10	100	93
C+ Orysastrobin (b-53)	10 + 10	100	89
Fluoxastrobin (b-51)	10	60	
Dimoxystrobin (b-52)	10	73	
Orysastrobin (b-53)	10	60	
A	10	73	
B	10	73	
C	10	73	

[0085] [Table 3-3]

Effective ingredient in the preparation	Treatment concentration (ppm)	Preventive value	Theoretical value
A+ Tiadinil (b-45)	10 + 10	100	89
A+ Probenazole (b-73)	10 + 10	100	89
A+ Tebufloquin (b-64)	10 + 10	100	93
A+ Isoprothiolane (b-71)	10 + 50	100	87
A+ Pyroquilon (b-104)	10 + 50	100	91
A+ Pencycuron (b-76)	10 + 250	93	84
B+ Tiadinil (b-45)	10 + 10	100	89
B+ Probenazole (b-73)	10 + 10	100	89
B+ Tebufloquin (b-64)	10 + 10	100	93
B+ Isoprothiolane (b-71)	10 + 50	100	87

B+ Pyroquilon (b-104)	10 + 50	97	91
B+ Pencycuron (b-76)	10 + 250	100	84
C+ Tiadinil (b-45)	10 + 10	100	89
C+ Probenazole (b-73)	10 + 10	100	89
C+ Tebufloquin (b-64)	10 + 10	100	93
C+ Isoprothiolane (b-71)	10 + 50	100	87
C+ Pyroquilon (b-104)	10 + 50	97	91
C+ Pencycuron (b-76)	10 + 250	97	84
Tiadinil (b-45)	10	60	
Probenazole (b-73)	10	60	
Tebufloquin (b-64)	10	73	
Isoprothiolane (b-71)	50	50	
Pyroquilon (b-104)	50	67	
Pencycuron (b-76)	250	40	
A	10	73	
B	10	73	
C	10	73	

[0086] [Table 3-4]

Effective ingredient in the preparation	Treatment concentration (ppm)	Preventive value	Theoretical value
A+ Benzovindiflupyr (b-2)	10 + 2	100	80
A+ Bixafen (b-4)	10 + 10	97	78
A+ Picoxystrobin (b-16)	10 + 2	100	83
A+ Trifloxystrobin (b-55)	10 + 2	100	86
A+ Pyraclostrobin(b-19)	10 + 2	100	80
A+ Fluopyram (b-43)	10 + 10	100	80
A+ Prothioconazole (b-23)	10 + 10	100	78
A+ Triadimenol (b-33)	10 + 250	97	78
A+ Pyrimethanil (b-62)	10 + 50	100	78
A+ Isotianil(b-46)	10 + 10	100	83
A+ Metominostrobin (b-54)	10 + 2	100	80
A+ Acibenzolar-S-methyl (b-72)	10 + 10	100	87
A+ Compound of formula (XIX) (b-94)	10 + 0.4	100	83
B+ Benzovindiflupyr (b-2)	10 + 2	100	80
B+ Bixafen (b-4)	10 + 10	100	78
B+ Picoxystrobin (b-16)	10 + 2	100	83
B+ Trifloxystrobin (b-55)	10 + 2	100	86
B+ Pyraclostrobin(b-19)	10 + 2	100	80
B+ Fluopyram (b-43)	10 + 10	100	80
B+ Prothioconazole (b-23)	10 + 10	100	78
B+ Triadimenol (b-33)	10 + 250	97	78
B+ Pyrimethanil (b-62)	10 + 50	97	78
B+ Isotianil(b-46)	10 + 10	100	83

B+ Metominostrobin (b-54)	10 + 2	100	80
B+ Acibenzolar-S-methyl (b-72)	10 + 10	100	87
B+ Compound of formula (XIX) (b-94)	10 + 0.4	100	83
C+ Benzovindiflupyr (b-2)	10 + 2	100	80
C+ Bixafen (b-4)	10 + 10	97	78
C+ Picoxystrobin (b-16)	10 + 2	100	83
C+ Trifloxystrobin (b-55)	10 + 2	100	86
C+ Pyraclostrobin(b-19)	10 + 2	100	80
C+ Fluopyram (b-43)	10 + 10	97	80
C+ Prothioconazole (b-23)	10 + 10	100	78
C+ Triadimenol (b-33)	10 + 250	97	78
C+ Pyrimethanil (b-62)	10 + 50	97	78
C+ Isotianil(b-46)	10 + 10	100	83
C+ Metominostrobin (b-54)	10 + 2	100	80
C+ Acibenzolar-S-methyl (b-72)	10 + 10	100	87
C+ Compound of formula (XIX) (b-94)	10 + 0.4	97	83
Benzovindiflupyr (b-2)	10 + 2	40	
Bixafen (b-4)	10 + 10	33	
Picoxystrobin (b-16)	10 + 2	50	
Trifloxystrobin (b-55)	10 + 2	57	
Pyraclostrobin(b-19)	10 + 2	40	
Fluopyram (b-43)	10 + 10	40	
Prothioconazole (b-23)	10 + 10	33	
Triadimenol (b-33)	10 + 250	33	
Pyrimethanil (b-62)	10 + 50	33	
Isotianil(b-46)	10 + 10	50	
Metominostrobin (b-54)	10 + 2	40	
Acibenzolar-S-methyl (b-72)	10 + 10	60	
Compound of formula (XIX) (b-94)	10 + 0.4	50	
A	10	67	
B	10	67	
C	10	67	

- [0087] Based on the results shown in Tables 3-1 to 3-4 above, synergistic effects were determined to be obtained when Compound A, Compound B or Compound C is used in combination with a compound of group b. Furthermore, there were no symptoms of chemical damage observed on the plant bodies or rice (variety: Sachikaze) even when
- 5 Compound A, Compound B or Compound C was used in combination with a compound of group b.

[0088] Comparative Example 2 Rice Blast Preventive Test

Wettable powder prepared in compliance with Comparative Preparation

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Example 4 containing the compounds indicated in Table 3-5 were sprayed to the rice plant leaves, a conidia suspension of *Pyricularia oryzae* was inoculated onto the plants, and the controlling effects were examined in a manner similar to Test Example 2. The results and theoretical values as determined according to Colby's formula are shown in

5 Table 3-5.

[0089] [Table 3-5]

Effective ingredient in the preparation	Treatment concentration (ppm)	Preventive value	Theoretical value
A+ Diclocymet	10 + 0.4	83	89
A+ Carpropamid	10 + 0.4	77	89
A+ Tolclofos-methyl	10 + 10	67	78
A+ Oxolinic acid	10 + 50	67	78
B+ Diclocymet	10 + 0.4	80	89
B+ Carpropamid	10 + 0.4	77	89
B+ Tolclofos-methyl	10 + 10	67	78
B+ Oxolinic acid	10 + 50	67	78
C+ Diclocymet	10 + 0.4	73	89
C+ Carpropamid	10 + 0.4	73	89
C+ Tolclofos-methyl	10 + 10	67	78
C+ Oxolinic acid	10 + 50	67	78
Diclocymet	0.4	67	
Carpropamid	0.4	67	
Tolclofos-methyl	10	33	
Oxolinic acid	50	33	
A	10	67	
B	10	67	
C	10	67	

[0090] Based on the results shown in Tables 3-5 above, even if these compounds are used in combination with Compound A, Compound B or Compound C, the controlling effects were under their theoretical values and the action resulting from combining two types of active ingredients is indicated to be antagonistic.

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[0091] Test Example 3 Barley Powdery Mildew Preventive Test

Barley plants (variety: Akashinriki) planted in plastic pots having a diameter of 5 cm were grown indoors to the second to fourth leaf stage. Wettable powder containing the compounds indicated in Table 4 were sprayed in the same manner as in

15 Test Example 1, and after the chemical had dried, conidia of *Blumeria graminis* was inoculated onto the leaves. Following inoculation, the pots were transferred to a constant-temperature chamber (20°C to 25°C), and control effects were examined 8 days after inoculation. During the examination, the percentage of affected area exhibiting lesions on the barley plants per pot was determined in accordance with the

following incidence degree indicators, and control values and theoretical values as determined according to Colby's formula were calculated in the same manner as in Test Example 1. The results are shown in Table 4.

[0092] Incidence Degree Indicators

5	Indicator	Incidence Degree
	0	No lesions
	0.5	Lesion area of about 1% to 2%
	1	Lesion area of less than 5%
	2	Lesion area of less than 25%
10	3	Lesion area of less than 50%
	4	Lesion area of less than 75%
	5	Lesion area of 75% or more

[0093] [Table 4]

Effective ingredient in the preparation	Treatment concentration n (ppm)	Control value	Theoretical value
A+ Fluxapyroxad (b-1)	10 + 2	67	63
A+ Benzovindiflupyr (b-2)	10 + 2	56	53
A+ Compound of formula (II) (b-3)	10 + 2	78	69
A+ Isofetamid (b-47)	10 + 10	86	69
A+ Compound of formula (XIV) (b-88)	10 + 2	72	58
A+ Compound of formula (VII)-1 (b-38)	10 + 2	97	82
B+ Fluxapyroxad (b-1)	10 + 2	67	63
B+ Benzovindiflupyr (b-2)	10 + 2	67	53
B+ Compound of formula (II) (b-3)	10 + 2	72	69
B+ Isofetamid (b-47)	10 + 10	83	69
B+ Compound of formula (XIV) (b-88)	10 + 2	61	58
B+ Compound of formula (VII)-1 (b-38)	10 + 2	89	82
C+ Fluxapyroxad (b-1)	10 + 2	86	63
C+ Benzovindiflupyr (b-2)	10 + 2	72	53
C+ Compound of formula (II) (b-3)	10 + 2	78	69
C+ Isofetamid (b-47)	10 + 10	92	69
C+ Compound of formula (XIV) (b-88)	10 + 2	61	58
C+ Compound of formula (VII)-1 (b-38)	10 + 2	83	82

Fluxapyroxad (b-1)	2	61
Benzovindiflupyr (b-2)	2	50
Compound of formula (II) (b-3)	2	67
Isofetamid (b-47)	10	67
Compound of formula (XIV) (b-88)	2	56
Compound of formula (VII)-1 (b-38)	2	81
A	10	6
B	10	6
C	10	6

[0094] Based on the results shown in Table 4 above, synergistic effects were determined to be obtained when Compound A, Compound B or Compound C is used in combination with a compound of group b. Furthermore, there were no symptoms of chemical damage observed on the plant bodies or barley (variety: Akashinriki) even when Compound A, Compound B or Compound C was used in combination with a compound of group b.

[0095] Test Example 4 Wheat Brown Rust Preventive Test

Wheat plants (variety: Norin 61 gou) planted in plastic pots having a diameter of 5 cm were grown indoors to the second to fourth leaf stage. Wettable powder containing the compounds indicated in Table 5 were sprayed in the same manner as in Test Example 1, and after the chemical had dried, a conidia suspension of *Puccinia recondita* was inoculated onto the leaves. Following inoculation, the pots were placed in the humidified chamber of an artificial inoculation room (20°C to 23°C), removed on the following day and then transferred to a greenhouse. Control effects were examined 8 days after inoculation. During the examination, the number of lesions on five leaves of the wheat plants was determined in accordance with the following incidence degree indicators, and control values and theoretical values as determined according to Colby's formula were calculated in the same manner as in Test Example 1. The results are shown in Table 5.

[0096]	Indicator	Incidence Degree
	0	No lesions
	0.5	1 to 2 lesions
	1	3 to 5 lesions
	2	6 to 20 lesions
	3	21 to 50 lesions
	4	51 to 80 lesions
	5	81 to 100 lesions

6

101 or more lesions

[0097] [Table 5]

Effective ingredient in the preparation	Treatment concentration (ppm)	Control value	Theoretical value
A+ Fluxapyroxad (b-1)	10 + 2	89	75
A+ Isofetamid (b-47)	10 + 10	22	14
A+ Picarbutrazox (b-78)	10 + 0.4	22	14
A+ Pyraziflumid (b-49)	10 + 2	92	86
A+ Compound of formula (XIV) (b-88)	10 + 2	53	48
A+ Compound of formula (VII)-1 (b-38)	10 + 2	82	73
B+ Fluxapyroxad (b-1)	10 + 2	86	74
B+ Isofetamid (b-47)	10 + 10	53	8
B+ Picarbutrazox (b-78)	10 + 0.4	53	8
B+ Pyraziflumid (b-49)	10 + 2	94	86
B+ Compound of formula (XIV) (b-88)	10 + 2	72	45
B+ Compound of formula (VII)-1 (b-38)	10 + 2	90	71
C+ Fluxapyroxad (b-1)	10 + 2	90	75
C+ Isofetamid (b-47)	10 + 10	47	11
C+ Picarbutrazox (b-78)	10 + 0.4	50	11
C+ Pyraziflumid (b-49)	10 + 2	92	86
C+ Compound of formula (XIV) (b-88)	10 + 2	64	47
C+ Compound of formula (VII)-1 (b-38)	10 + 2	78	72
Fluxapyroxad (b-1)	2	72	
Isofetamid (b-47)	10	3	
Picarbutrazox (b-78)	0.4	3	
Pyraziflumid (b-49)	2	85	
Compound of formula (XIV) (b-88)	2	42	
Compound of formula (VII)-1 (b-38)	2	69	
A	10	11	

B	10	6
C	10	8

[0098] Based on the results shown in Table 5 above, synergistic effects were determined to be obtained when Compound A, Compound B or Compound C is used in combination with a compound of group b. Furthermore, there were no symptoms of chemical damage observed on the plant bodies or wheat (variety: Norin No. 61) even when Compound A, Compound B or Compound C was used in combination with a compound of group b.

[0099] Test Example 5 Tomato Late Blight Preventive Test

Tomato plants (variety: Ohgata Fukuju) planted in plastic pots having a diameter of 5 cm were grown indoors to the second to third leaf stage. Wettable powders containing the compounds indicated in Table 6 were sprayed in the same manner as in Test Example 1, and after the chemical had dried, a zoospores and zoosporangium suspension of *Phytophthora infestans* was inoculated by spraying onto the plants. Following inoculation, the pots were placed in the humidified chamber of an artificial inoculation room (20°C to 22°C) and then transferred to a greenhouse on the following day followed by examining control effects 5 days after inoculation. The percentage of affected area exhibiting lesions on a single tomato leaf was determined in accordance with the same indicators as used in Test Example 1, and control values and theoretical values as determined according to Colby's formula were calculated in the same manner as in Test Example 1. The results are shown in Tables 6-1 to 6-2.

[0100] [Table 6-1]

Effective ingredient in the preparation	Treatment concentration (ppm)	Control value	Theoretical value
A+ Picarbutrazox (b-78)	10 + 0.4	96	77
B+ Picarbutrazox (b-78)	10 + 0.4	96	78
C+ Picarbutrazox (b-78)	10 + 0.4	94	76
Picarbutrazox (b-78)	0.4	75	
A	10	8	
B	10	13	
C	10	4	

[0101] [Table 6-2]

Effective ingredient in the preparation	Treatment concentration (ppm)	Preventive value	Theoretical value
A+ Mandipropamid (b-44)	10 + 0.08	97	78

A+ Fluopicolide (b-40)	10 + 2	97	60
A+ Benalaxyl-M (b-75)	10 + 2	87	60
A+ Iprovalicarb (b-50)	10 + 2	90	67
A+ Amisulbrom (b-97)	10 + 0.08	83	67
A+ Ametoctradin (b-95)	10 + 2	87	60
A+ Zoxamide (b-39)	10 + 0.4	83	60
A+ Hymexazol (b-106)	10 + 250	73	56
B+ Mandipropamid (b-44)	10 + 0.08	93	78
B+ Fluopicolide (b-40)	10 + 2	87	60
B+ Benalaxyl-M (b-75)	10 + 2	90	60
B+ Iprovalicarb (b-50)	10 + 2	90	67
B+ Amisulbrom (b-97)	10 + 0.08	87	67
B+ Ametoctradin (b-95)	10 + 2	83	60
B+ Zoxamide (b-39)	10 + 0.4	87	60
B+ Hymexazol (b-106)	10 + 250	73	56
C+ Mandipropamid (b-44)	10 + 0.08	97	80
C+ Fluopicolide (b-40)	10 + 2	93	64
C+ Benalaxyl-M (b-75)	10 + 2	90	64
C+ Iprovalicarb (b-50)	10 + 2	90	70
C+ Amisulbrom (b-97)	10 + 0.08	90	70
C+ Ametoctradin (b-95)	10 + 2	90	64
C+ Zoxamide (b-39)	10 + 0.4	87	64
C+ Hymexazol (b-106)	10 + 250	83	60
Mandipropamid (b-44)	0.08	67	
Fluopicolide (b-40)	2	40	
Benalaxyl-M (b-75)	2	40	
Iprovalicarb (b-50)	2	50	
Amisulbrom (b-97)	0.08	50	
Ametoctradin (b-95)	2	40	
Zoxamide (b-39)	0.4	40	
Hymexazol (b-106)	250	33	
A	10	33	
B	10	33	
C	10	40	

[0102] [Table 6-3]

Effective ingredient in the preparation	Treatment concentration (ppm)	Preventive value	Theoretical value
A+ Oxathiapiprolin (b-84)	10 + 0.0016	100	82
A+ Dithianon (b-81)	10 + 2	87	64
A+ D-tagatose (b-93)	10 + 5000	90	68
B+ Oxathiapiprolin (b-84)	10 + 0.0016	100	80
B+ Dithianon (b-81)	10 + 2	87	60
B+ D-tagatose (b-93)	10 + 5000	93	64
C+ Oxathiapiprolin (b-84)	10 + 0.0016	100	79
C+ Dithianon (b-81)	10 + 2	87	58

C+ D-tagatose (b-93)	10 + 5000	90	62
Oxathiapiprolin (b-84)	0.0016	67	
Dithianon (b-81)	2	33	
D-tagatose (b-93)	5000	40	
A	10	47	
B	10	40	
C	10	37	

[0103] Based on the results shown in Tables 6-1 and 6-3 above, synergistic effects were determined to be obtained when Compound A, Compound B or Compound C is used in combination with a compound of group b. Furthermore, there were no symptoms of chemical damage observed on the plant bodies or tomatoes (variety: Ohgata Fukuju) even when Compound A, Compound B or Compound C was used in combination with a compound of group b.

[0104] Test example 6 Cucumber powdery mildew preventive test

In a greenhouse, cucumber (variety: Sagamihanshiro) planted in a plastic pot having a diameter of 5 cm was grown to the 3rd to 5th-leaf stage. Spray was carried out in the same manner as in Test example 1, and 3 days after the spray, a conidia suspension prepared from *Sphaerotheca fuliginea* were inoculated on the leaf surface. After inoculation, the pots were placed in a thermostatic greenhouse (20 to 25°C), and controlling effects were examined after 7 days from the inoculation. In the examination, a ratio of lesion area occupied per one leaf of cucumber was determined according to the same index as in Test example 1, and the control value and the theoretical value according to Colby's formula were similarly calculated. The results are shown in Table 7-1 to 7- 8

[0105] [Table 7-1]

Effective ingredient in the preparation	Treatment concentration (ppm)	Control value	Theoretical value
A+ Fluoxastrobin (b-51)	10 + 2	93	73
A+ Dimoxystrobin (b-52)	10 + 2	93	73
A+ Orysastrobin (b-53)	10 + 2	97	60
B+ Fluoxastrobin (b-51)	10 + 2	87	73
B+ Dimoxystrobin (b-52)	10 + 2	93	73
B+ Orysastrobin (b-53)	10 + 2	90	60
C+ Fluoxastrobin (b-51)	10 + 2	97	73
C+ Dimoxystrobin (b-52)	10 + 2	93	73
C+ Orysastrobin (b-53)	10 + 2	97	60
Fluoxastrobin (b-51)	2	60	
Dimoxystrobin (b-52)	2	60	
Orysastrobin (b-53)	2	40	
A	10	33	
B	10	33	

C	10	33	
[0106] [Table 7-2]			
Effective ingredient in the preparation	Treatment concentration (ppm)	Control value	Theoretical value
A+ Carboxin (b-41)	10 + 50	87	50
A+ Thifluzamide (b-42)	10 + 50	100	78
A+ Isopyrazam (b-7)	10 + 0.4	87	50
A+ Sedaxane (b-6)	10 + 0.4	87	50
A+ Penflufen (b-5)	10 + 2	100	78
A+ Cyprodinil (b-61)	10 + 10	87	50
A+ Fenpyrazamine (b-99)	10 + 50	87	44
B+ Carboxin (b-41)	10 + 50	87	50
B+ Thifluzamide (b-42)	10 + 50	100	78
B+ Isopyrazam (b-7)	10 + 0.4	87	50
B+ Sedaxane (b-6)	10 + 0.4	87	50
B+ Penflufen (b-5)	10 + 2	100	78
B+ Cyprodinil (b-61)	10 + 10	87	50
B+ Fenpyrazamine (b-99)	10 + 50	87	44
C+ Carboxin (b-41)	10 + 50	87	50
C+ Thifluzamide (b-42)	10 + 50	100	78
C+ Isopyrazam (b-7)	10 + 0.4	93	50
C+ Sedaxane (b-6)	10 + 0.4	90	50
C+ Penflufen (b-5)	10 + 2	100	78
C+ Cyprodinil (b-61)	10 + 10	87	50
C+ Fenpyrazamine (b-99)	10 + 50	87	44
Carboxin (b-41)	50	40	
Thifluzamide (b-42)	50	73	
Isopyrazam (b-7)	0.4	40	
Sedaxane (b-6)	0.4	40	
Penflufen (b-5)	2	73	
Cyprodinil (b-61)	10	40	
Fenpyrazamine (b-99)	50	33	
A	10	17	
B	10	17	
C	10	17	

[0107] [Table 7-3]

Effective ingredient in the preparation	Treatment concentration (ppm)	Preventive value	Theoretical value
A+ Tetraconazole (b-22)	10 + 0.4	83	70
A+ Epoxiconazole (b-24)	10 + 0.4	90	64
A+ Ipconazole (b-25)	10 + 0.4	93	70
A+ Metconazole (b-26)	10 + 0.4	90	70
A+ Propiconazole (b-27)	10 + 0.4	93	64
A+ Cyproconazole (b-28)	10 + 0.4	87	64

A+ Difenoconazole (b-29)	10 + 0.4	90	70
A+ Fluquinconazole (b-30)	10 + 0.4	90	70
A+ Flusilazole (b-31)	10 + 0.4	87	64
A+ Penconazole(b-32)	10 + 0.4	87	68
A+ Flutriafol (b-34)	10 + 0.4	90	64
A+ Myclobutanil (b-35)	10 + 0.4	93	68
A+ Imazalil (b-20)	10 + 0.4	90	60
A+ Prochloraz(b-21)	10 + 0.4	87	68
B+ Tetraconazole (b-22)	10 + 0.4	87	67
B+ Epoxiconazole (b-24)	10 + 0.4	83	60
B+ Ipconazole (b-25)	10 + 0.4	87	67
B+ Metconazole (b-26)	10 + 0.4	90	67
B+ Propiconazole (b-27)	10 + 0.4	87	60
B+ Cyproconazole (b-28)	10 + 0.4	83	64
B+ Difenoconazole (b-29)	10 + 0.4	87	60
B+ Fluquinconazole (b-30)	10 + 0.4	90	64
B+ Flusilazole (b-31)	10 + 0.4	87	56
B+ Penconazole(b-32)	10 + 0.4	90	64
B+ Flutriafol (b-34)	10 + 0.4	87	60
B+ Myclobutanil (b-35)	10 + 0.4	80	56
B+ Imazalil (b-20)	10 + 0.4	83	60
B+ Prochloraz(b-21)	10 + 0.4	87	67
C+ Tetraconazole (b-22)	10 + 0.4	90	67
C+ Epoxiconazole (b-24)	10 + 0.4	93	60
C+ Ipconazole (b-25)	10 + 0.4	90	67
C+ Metconazole (b-26)	10 + 0.4	90	67
C+ Propiconazole (b-27)	10 + 0.4	90	60
C+ Cyproconazole (b-28)	10 + 0.4	87	64
C+ Difenoconazole (b-29)	10 + 0.4	90	60
C+ Fluquinconazole (b-30)	10 + 0.4	87	64
C+ Flusilazole (b-31)	10 + 0.4	90	56
C+ Penconazole(b-32)	10 + 0.4	87	64
C+ Flutriafol (b-34)	10 + 0.4	83	60
C+ Myclobutanil (b-35)	10 + 0.4	87	56
C+ Imazalil (b-20)	10 + 0.4	90	60
C+ Prochloraz(b-21)	10 + 0.4	87	67
Tetraconazole (b-22)	0.4	50	
Epoxiconazole (b-24)	0.4	40	
Ipconazole (b-25)	0.4	50	
Metconazole (b-26)	0.4	50	
Propiconazole (b-27)	0.4	40	
Cyproconazole (b-28)	0.4	47	
Difenoconazole (b-29)	0.4	40	
Fluquinconazole (b-30)	0.4	47	
Flusilazole (b-31)	0.4	33	
Penconazole(b-32)	0.4	47	
Flutriafol (b-34)	0.4	40	

Myclobutanil (b-35)	0.4	33
Imazalil (b-20)	0.4	40
Prochloraz(b-21)	0.4	50
A	10	40
B	10	33
C	10	33

[0108] [Table 7-4]

Effective ingredient in the preparation	Treatment concentration (ppm)	Preventive value	Theoretical value
A+ Thiabendazole (b-60)	10 + 10	90	64
A+ Benomyl (b-58)	10 + 10	97	70
A+ Thiuram (b-68)	10 + 50	87	60
A+ Metiram (b-67)	10 + 50	87	60
A+ Folpet (b-70)	10 + 50	80	60
A+ Pyrisoxazole (b-103)	10 + 50	90	60
B+ Thiabendazole (b-60)	10 + 10	97	64
B+ Benomyl (b-58)	10 + 10	93	70
B+ Thiuram (b-68)	10 + 50	80	60
B+ Metiram (b-67)	10 + 50	80	60
B+ Folpet (b-70)	10 + 50	77	60
B+ Pyrisoxazole (b-103)	10 + 50	97	60
C+ Thiabendazole (b-60)	10 + 10	97	64
C+ Benomyl (b-58)	10 + 10	97	70
C+ Thiuram (b-68)	10 + 50	83	60
C+ Metiram (b-67)	10 + 50	80	60
C+ Folpet (b-70)	10 + 50	80	60
C+ Pyrisoxazole (b-103)	10 + 50	90	60
Thiabendazole (b-60)	10	40	
Benomyl (b-58)	10	50	
Thiuram (b-68)	50	33	
Metiram (b-67)	50	33	
Folpet (b-70)	50	33	
Pyrisoxazole (b-103)	50	33	
A	10	40	
B	10	40	
C	10	40	

[0109] [Table 7-5]

Effective ingredient in the preparation	Treatment concentration (ppm)	Preventive value	Theoretical value
A+ Fenpropimorph (b-65)	10 + 0.4	80	60
A+ Tridemorph (b-66)	10 + 0.4	80	60
A+ Metrafenone (b-82)	10 + 0.08	83	64
A+ Quinoxifen (b-63)	10 + 0.016	97	76
A+ Flutianil (b-77)	10 + 0.016	97	80

A+ Proquinazid (b-100)	10 + 0.016	97	64
A+ Spiroxamine (b-101)	10 + 0.4	83	60
A+ Fenpropidin (b-102)	10 + 0.4	97	64
A+ Sulfur (b-96)	10 + 10	100	84
A+ Chinomethionat (b-74)	10 + 0.4	83	70
B+ Fenpropimorph (b-65)	10 + 0.4	80	60
B+ Tridemorph (b-66)	10 + 0.4	80	60
B+ Metrafenone (b-82)	10 + 0.08	83	64
B+ Quinoxifen (b-63)	10 + 0.016	83	76
B+ Flutianil (b-77)	10 + 0.016	97	80
B+ Proquinazid (b-100)	10 + 0.016	97	64
B+ Spiroxamine (b-101)	10 + 0.4	87	60
B+ Fenpropidin (b-102)	10 + 0.4	80	64
B+ Sulfur (b-96)	10 + 10	97	84
B+ Chinomethionat (b-74)	10 + 0.4	83	70
C+ Fenpropimorph (b-65)	10 + 0.4	83	60
C+ Tridemorph (b-66)	10 + 0.4	83	60
C+ Metrafenone (b-82)	10 + 0.08	93	64
C+ Quinoxifen (b-63)	10 + 0.016	97	76
C+ Flutianil (b-77)	10 + 0.016	97	80
C+ Proquinazid (b-100)	10 + 0.016	97	64
C+ Spiroxamine (b-101)	10 + 0.4	87	60
C+ Fenpropidin (b-102)	10 + 0.4	80	64
C+ Sulfur (b-96)	10 + 10	97	84
C+ Chinomethionat (b-74)	10 + 0.4	80	70
Fenpropimorph (b-65)	0.4	33	
Tridemorph (b-66)	0.4	33	
Metrafenone (b-82)	0.08	40	
Quinoxifen (b-63)	0.016	60	
Flutianil (b-77)	0.016	67	
Proquinazid (b-100)	0.016	40	
Spiroxamine (b-101)	0.4	33	
Fenpropidin (b-102)	0.4	40	
Sulfur (b-96)	10	73	
Chinomethionat (b-74)	0.4	50	
A	10	40	
B	10	40	
C	10	40	

[0110] [Table 7-6]

Effective ingredient in the preparation	Treatment concentration (ppm)	Preventive value	Theoretical value
A+ Tiadinil (b-45)	10 + 10	87	64
A+ Probenazole (b-73)	10 + 10	93	64
A+ Tebufloquin (b-64)	10 + 10	90	80
A+ Isoprothiolane (b-71)	10 + 10	83	64

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A+ Pyroquilon (b-104)	10 + 50	83	44
A+ Pencycuron (b-76)	10 + 250	80	60
B+ Tiadinil (b-45)	10 + 10	83	64
B+ Probenazole (b-73)	10 + 10	87	64
B+ Tebufloquin (b-64)	10 + 10	93	80
B+ Isoprothiolane (b-71)	10 + 10	80	64
B+ Pyroquilon (b-104)	10 + 50	80	44
B+ Pencycuron (b-76)	10 + 250	80	60
C+ Tiadinil (b-45)	10 + 10	93	64
C+ Probenazole (b-73)	10 + 10	90	64
C+ Tebufloquin (b-64)	10 + 10	87	80
C+ Isoprothiolane (b-71)	10 + 10	80	64
C+ Pyroquilon (b-104)	10 + 50	80	44
C+ Pencycuron (b-76)	10 + 250	77	60
Tiadinil (b-45)	10	40	
Probenazole (b-73)	10	40	
Tebufloquin (b-64)	10	67	
Isoprothiolane (b-71)	10	40	
Pyroquilon (b-104)	50	7	
Pencycuron (b-76)	250	33	
A	10	40	
B	10	40	
C	10	40	

[0111] [Table 7-7]

Effective ingredient in the preparation	Treatment concentration (ppm)	Preventive value	Theoretical value
A+ Pyriofenone (b-83)	10 + 0.08	93	64
A+Compound of formula (XV)-1 (b-89)	10 + 2	93	64
A+ Oxathiapiprolin (b-84)	10 + 50	87	50
A+ Compound of formula (XIX) (b-94)	10 + 10	93	70
A+ Compound of formula (XVII) (b-91)	10 + 0.08	97	64
A+ Compound of formula (III) (b-8)	10 + 0.4	97	76
A+ Compound of formula (IV) (b-9)	10 + 0.4	97	76
Isotianil(b-46)	10 + 2	90	60
Acibenzolar-S -methyl (b-72)	10 + 2	90	60
B+ Pyriofenone (b-83)	10 + 0.08	93	64
B+Compound of formula (XV)-1 (b-89)	10 + 2	93	64
B+ Oxathiapiprolin (b-84)	10 + 50	87	50
B+ Compound of	10 + 10	93	70

formula (XIX) (b-94)			
B+ Compound of formula (XVII) (b-91)	10 + 0.08	97	64
B+ Compound of formula (III) (b-8)	10 + 0.4	100	76
B+ Compound of formula (IV) (b-9)	10 + 0.4	97	76
B+ Isotianil(b-46)	10 + 2	93	60
B+ Acibenzolar-S-methyl (b-72)	10 + 2	93	60
C+ Pyriofenone (b-83)	10 + 0.08	93	64
C+Compound of formula (XV)-1 (b-89)	10 + 2	90	64
C+ Oxathiapiprolin (b-84)	10 + 50	87	50
C+ Compound of formula (XIX) (b-94)	10 + 10	93	70
C+ Compound of formula (XVII) (b-91)	10 + 0.08	97	64
C+ Compound of formula (III) (b-8)	10 + 0.4	97	76
C+ Compound of formula (IV) (b-9)	10 + 0.4	97	76
C+ Isotianil(b-46)	10 + 2	90	60
C+ Acibenzolar-S-methyl (b-72)	10 + 2	90	60
Pyriofenone (b-83)	0.08	40	
Compound of formula (XV)-1 (b-89)	2	40	
Oxathiapiprolin (b-84)	50	17	
Compound of formula (XIX) (b-94)	10	50	
Compound of formula (XVII) (b-91)	0.08	40	
Compound of formula (III) (b-8)	0.4	60	
Compound of formula (IV) (b-9)	0.4	60	
A+ Isotianil(b-46)	2	33	
A+ Acibenzolar-S-methyl (b-72)	2	33	
A	10	40	
B	10	40	
C	10	40	

[0112] [Table 7-8]

Effective ingredient in the preparation	Treatment concentration (ppm)	Preventive value	Theoretical value
A+ Phosphorous acid (b-105)	10 + 50	93	60
A+ Propineb (b-69)	10 + 50	97	50

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A+ Compound of (V) (b-36)	10 + 0.4	90	60
A+ Compound of (XIV) (b-88)	10 + 0.4	93	64
A+ Compound of (XI)-1 (b-85)	10 + 10	97	70
A+ Compound of (XI)-2 (b-85)	10 + 10	93	70
A+ Compound of (XVIII) (b-92)	10 + 0.4	90	64
A+ D-tagatose (b-93)	10 + 5000	93	60
B+ Phosphorous acid (b-105)	10 + 50	90	60
B+ Propineb (b-69)	10 + 50	97	50
B+ Compound of (V) (b-36)	10 + 0.4	93	60
B+ Compound of (XIV) (b-88)	10 + 0.4	93	64
B+ Compound of (XI)-1 (b-85)	10 + 10	93	70
B+ Compound of (XI)-2 (b-85)	10 + 10	97	70
B+ Compound of (XVIII) (b-92)	10 + 0.4	97	64
B+ D-tagatose (b-93)	10 + 5000	93	60
C+ Phosphorous acid (b-105)	10 + 50	90	60
C+ Propineb (b-69)	10 + 50	97	50
C+ Compound of (V) (b-36)	10 + 0.4	93	60
C+ Compound of (XIV) (b-88)	10 + 0.4	97	64
C+ Compound of (XI)-1 (b-85)	10 + 10	90	70
C+ Compound of (XI)-2 (b-85)	10 + 10	90	70
C+ Compound of (XVIII) (b-92)	10 + 0.4	93	64
C+ D-tagatose (b-93)	10 + 5000	93	60
Phosphorous acid (b-105)	50	33	
Propineb (b-69)	50	17	
Compound of (V) (b-36)	0.4	33	
Compound of (XIV) (b-88)	0.4	40	
Compound of (XI)-1 (b-85)	10	50	
Compound of (XI)-2 (b-85)	10	50	
Compound of (XVIII) (b-92)	0.4	40	
D-tagatose (b-93)	5000	33	
A	10	40	
B	10	40	
C	10	40	

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- [0113] From the results shown in the above-mentioned Table 7-1 to 7-8, it could be understood that synergistic effects could be obtained when Compound A, B or C and the compound of Group b are used in combination. Incidentally, even when Compound A, B or C and the compound of Group b are used in combination, no chemical damage symptom was admitted in the plant material, cucumber (variety: Sagamihanpaku).

[0114] Comparative example 3 Cucumber powdery mildew preventive test

- Wettable powder prepared in compliance with Comparative Preparation Example 4 containing the compounds indicated in Table 7-9 were sprayed to the cucumber leaves, a conidiospore suspension prepared from *Sphaerotheca fuliginea* was inoculated onto the plants, and the controlling effects were examined in a manner similar to Test Example 6. The results and theoretical values as determined according to Colby's formula are shown in Table 7-9.

[0115] [Table 7-9]

Effective ingredient in the preparation	Treatment concentration (ppm)	Preventive value	Theoretical value
A+ Diclocymet	10 + 50	50	60
A+ Carpropamid	10 + 50	47	64
A+ Tolclofos-methyl	10 + 50	40	60
A+ Oxolinic acid	10 + 50	40	60
B+ Diclocymet	10 + 50	40	60
B+ Carpropamid	10 + 50	40	64
B+ Tolclofos-methyl	10 + 50	40	60
B+ Oxolinic acid	10 + 50	40	60
C+ Diclocymet	10 + 50	40	60
C+ Carpropamid	10 + 50	40	64
C+ Tolclofos-methyl	10 + 50	33	60
C+ Oxolinic acid	10 + 50	33	60
Diclocymet	50	40	
Carpropamid	50	33	
Tolclofos-methyl	50	33	
Oxolinic acid	50	33	
A	10	40	
B	10	40	
C	10	40	

- [0116] Based on the results shown in Tables 7-9 above, even if these compounds are used in combination with Compound A, Compound B or Compound C, the controlling effects were under their theoretical values and the action resulting from combining two types of active ingredients is indicated to be antagonistic.

[0117] Test example 7 Cucumber downy mildew preventive test

In a greenhouse, cucumber (variety: Sagamihanshiro) planted in a plastic pot having a diameter of 5 cm was grown to the 3rd to 5th-leaf stage. Spray was carried out in the same manner as in Test example 1, and after drying the chemical liquid, the pots were transferred into a greenhouse. After 3 days from the spray, a zoosporangium suspension of *Pseudoperonospora cubensis* was inoculated. After inoculation, the pots were placed in a high-humidity chamber (20 to 25°C), transferred into a greenhouse on the next day, and controlling effects were examined after 7 days from the inoculation. A ratio of lesion area occupied per one leaf of cucumber was determined according to the same index as in Test example 1, and the control value and the theoretical value according to Colby's formula were similarly calculated. The results are shown in Tables 8.

[0118] [Table 8]

Effective ingredient in the preparation	Treatment concentration (ppm)	Preventive value	Theoretical value
A+ Mandipropamid (b-44)	10 + 0.08	100	76
A+ Fluopicolide (b-40)	10 + 2	97	76
A+ Benalaxyl-M (b-75)	10 + 2	100	76
A+ Iprovalicarb (b-50)	10 + 2	93	63
A+ Amisulbrom (b-97)	10 + 0.08	93	76
A+ Ametoctradin (b-95)	10 + 2	93	63
A+ Zoxamide (b-39)	10 + 0.4	93	51
A+ Hymexazol (b-106)	10 + 250	93	39
B+ Mandipropamid (b-44)	10 + 0.08	97	74
B+ Fluopicolide (b-40)	10 + 2	93	74
B+ Benalaxyl-M (b-75)	10 + 2	97	74
B+ Iprovalicarb (b-50)	10 + 2	93	62
B+ Amisulbrom (b-97)	10 + 0.08	93	74
B+ Ametoctradin (b-95)	10 + 2	97	62
B+ Zoxamide (b-39)	10 + 0.4	93	49
B+ Hymexazol (b-106)	10 + 250	93	36
C+ Mandipropamid (b-44)	10 + 0.08	93	72
C+ Fluopicolide (b-40)	10 + 2	90	72
C+ Benalaxyl-M (b-75)	10 + 2	90	72
C+ Iprovalicarb (b-50)	10 + 2	93	58
C+ Amisulbrom (b-97)	10 + 0.08	97	72
C+ Ametoctradin (b-95)	10 + 2	97	58
C+ Zoxamide (b-39)	10 + 0.4	97	44
C+ Hymexazol (b-106)	10 + 250	87	31
Mandipropamid (b-44)	0.08	67	
Fluopicolide (b-40)	2	67	
Benalaxyl-M (b-75)	2	67	

Iprovalicarb (b-50)	2	50
Amisulbrom (b-97)	0.08	67
Ametoctradin (b-95)	2	50
Zoxamide (b-39)	0.4	33
Hymexazol (b-106)	250	17
A	10	27
B	10	23
C	10	17

[0119] From the results of the above-mentioned Tables 8, it could be understood that synergistic effects could be obtained when Compound A, B or C and the compound of Group b are used in combination. Incidentally, even when Compound A, B or C and the compound of Group b are used in combination, no chemical damage symptom was admitted in the plant material, cucumber (variety: Sagamihanpaku).

INDUSTRIAL APPLICABILITY

[0120] The plant disease control composition of the present invention is used as a superior plant disease control agent since it has a plurality of disease spectra against various plant pathogens, including fungicide-resistant organisms (such as *Pyricularia oryzae* that causes rice blast or *Botrytis cinerea* that causes gray mold in tomatoes, cucumbers and green beans), exhibits superior control effects (synergistic control effects) that cannot be predicted from the individual components alone, demonstrates a high level of plant disease control effects even against organisms resistant to existing chemical agents, and is observed to be free of the occurrence of phytotoxicity.

CLAIMS:

1. A fungicidal composition for plants comprising as active ingredients thereof:

(a) at least one quinoline compound selected from the group consisting of:

(a-14) 3-(5-fluoro-3,3,4,4-tetramethyl-3,4-dihydroisoquinolin-1-yl)quinoline,

5 (a-18) 3-(4,4-difluoro-3,3-dimethyl-3,4-dihydroisoquinolin-1-yl)quinoline, and

(a-20) 3-(4,4,5-trifluoro-3,3-dimethyl-3,4-dihydroisoquinolin-1-yl)quinoline, or a salt thereof

(group a); and

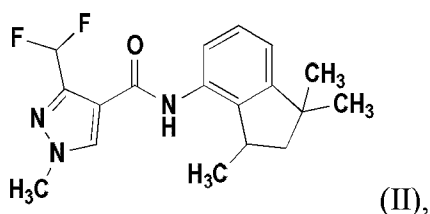
(b) one or more fungicidal compounds selected from (group b):

pyrazole carboxamides consisting of

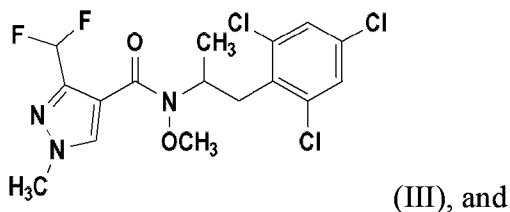
10 (b-1) Fluxapyroxad,

(b-2) Benzovindiflupyr,

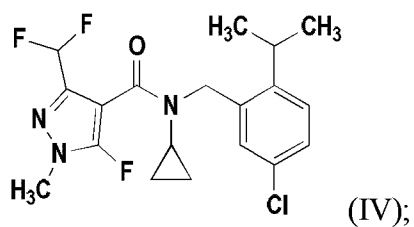
(b-3) a compound of formula (II)



(b-8) a compound of formula (III)



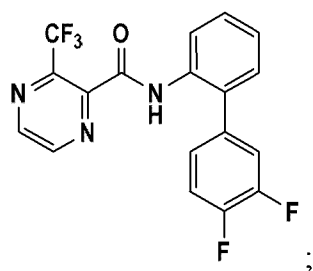
(b-9) a compound of formula (IV)



amide compounds consisting of

(b-47) Isofetamid, and

(b-49) Pyraziflumid,

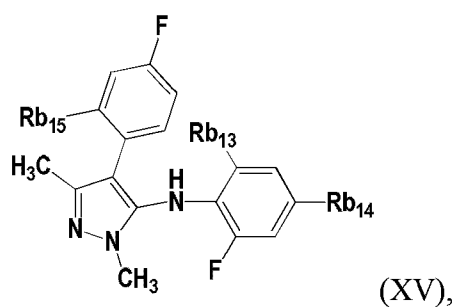


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other fungicidal compounds (i) consisting of

(b-84) Oxathiapiprolin, and

(b-89) compounds of general formula (XV)



10

wherein Rb₁₃ represents a chlorine atom or fluorine atom,

Rb₁₄ represents a chlorine atom or hydrogen atom and

Rb₁₅ represents a chlorine atom or bromine atom;

provided that a combination of (a-18) and (b-8) or (b-9) is excluded.

2. The fungicidal composition for plants of claim 1, wherein a weight ratio of compound (a): compound (b) is 1: 0.01 to 100.

3. A method for controlling a plant fungal disease, comprising applying the plant
5 disease control composition according to claim 1 or 2.

4. A method for controlling a plant fungal disease, comprising simultaneously applying
a plant disease control composition containing a quinoline compound of group a according to
claim 1 or 2 as an active ingredient thereof and a plant disease control composition containing
10 a fungicidal compound of group b according to claim 1 as an active ingredient thereof, or
applying one of either a plant disease control composition containing a quinoline compound
of group a according to claim 1 as an active ingredient thereof or a plant disease control
composition containing a fungicidal compound of group b according to claim 1 as an active
ingredient thereof, followed by applying the other composition.

15

5. The method of claim 3 or 4, wherein the plant fungal disease is blast, sheath blight,
brown spot, "Bakanae" disease, seedling blight, false smut or kernel smut of rice; powdery
mildew, rust, mottle leaf, net blotch, fusarium blight, snow mould, loose kernel smut, stinking
smut, eye spot, foot rot, scald, leaf blight, glume blotch, seedling blight, damping off,
20 anthracnose, ergot or spot blotch of family of wheat and barley; fusarium blight, seedling
blight, rust, brown spot, smut, anthracnose or Northern leaf spot of corn; downy mildew, rust,
powdery mildew, anthracnose, ripe rot, black rot, dead arm, fry speck, gray mold, bud blight,
violet root rot or white root rot of grape vine; powdery mildew, scab, alternaria blotch, rust,
blossom blight, valsa canker, ring rot, anthracnose, fry speck, sooty blotch, fruit spot, violet

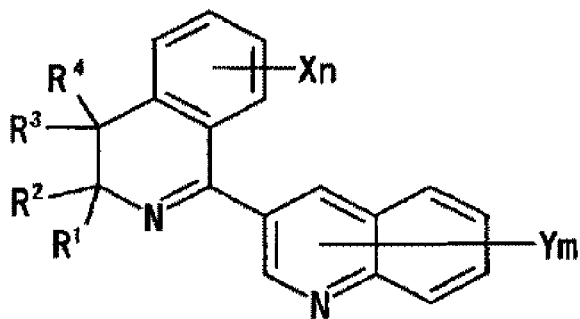
root rot, white root rot, diaportha canker or blotch of apple; pear black spot, scab, rust,
 Physalospora canker or canker of Japanese pear; phytophthora rot of European pear; scab,
 phomopsis rot, phytophthora fruit rot or anthracnose of peach; anthracnose, young-fruit rot or
 brown rot of cherry; anthracnose, angular leaf spot, powdery mildew of persimmon; melanose,
 5 common green mold, blue mold or scab of citrus; gray mold (*Botrytis cinerea*) of tomato,
 cucumber, pulse, strawberry, potato, cabbage, eggplant, or lettuce; stem rot of tomato, cucum-
 ber, bean, strawberry, potato, rape, cabbage, eggplant, or lettuce; seedling blight of tomato,
 cucumber, bean, Japanese radish, water melon, eggplant, rape, green pepper, spinach, or sugar
 beet; downy mildew, powdery mildew, anthracnose, gummy stem blight, fusarium wilt or
 10 phytophthora rot of oriental melon; early blight, leaf mold, late blight, fusarium wilt, root rot
 or anthracnose of tomato; powdery mildew, leaf mold, late blight or brown rot of eggplant;
 alternaria leaf spot of rapeseed; alternaria leaf spot, white spot, blackleg, club root or downy
 mildew of Brassica vegetables; foot rot or yellows of cabbage; bottom rot or yellows of
 Chinese cabbage; rust, alternaria leaf spot, southern blight or white tip disease of welsh onion;
 15 purple stain, sphaceloma scab, black spot, rhizoctonia root rot, stem rot, downy mildew, rust
 or anthracnose of soybean; anthracnose of kidney bean; leaf spot or brown leaf spot of
 peanuts; powdery mildew or downy mildew of pea; downy mildew or phytophthora rot of
 broad bean; early blight, black scurf, late blight, silver scurf, dry spot or powdery scab of
 potato; cercospora leaf spot, downy mildew, aphanomyces root rot or leaf spot of sugar beet;
 20 leaf blight of carrots; powdery mildew, phytophthora rot, anthracnose or soft-rotted fruits of
 strawberry; net blister blight, white scab, anthracnose or gray blight of green tea; brown spot,
 powdery mildew, anthracnose or black shank of tobacco; damping off of cotton; sclerotinia
 rot of sunflower; black spot, powdery mildew, phytophthora rot or downy mildew of rose; leaf
 blight, rust or phytophthora rot of chrysanthemum; or brown patch, dollar spot, Curvularia

leaf blight, rust, Helminthosporium leaf blight, scald, damping off, anthracnose, typhula brown snow blight, typhula black snow blight, sclerotinia snow blight, fairy rings, pythium blight or blast of turf grass.

- 5 6. The method of claim 3 or 4, wherein the plant fungal disease is caused by
Pyricularia oryzae, *Thanatephorus cucumeris*, *Rhizoctonia solani*, *Cochliobolus miyabeanus*,
Gibberella fujikuroi, *Pythium* spp., *Fusarium* spp., *Trichoderma* spp., *Rhizopus* spp.,
Rhizoctonia, *Claviceps virens*, *Tilletia barclayana*, *Erysiphe graminis f.sp.hordei*, *f.sp.tritici*,
Puccinia striiformis, *Puccinia graminis*, *Puccinia recondita*, *Puccinia hordei*, *Pyrenophora*
10 *graminea*, *Pyrenophora teres*, *Fusarium graminearum*, *Fusarium culmorum*, *Fusarium*
avenaceum, *Microdochium nivale*, *Typhula incarnata*, *Typhula ishikariensis*, *Microneectriella*
nivalis, *Ustilago nuda*, *Ustilago tritici*, *Ustilago nigra*, *Ustilago avenae*, *Tilletia caries*,
Tilletia pancicii, *Pseudocercospora herpotrichoides*, *Rhizoctonia cerealis*, *Rhynchosporium*
secalis, *Septoria tritici*, *Leptosphaeria nodorum*, *Rhizoctonia* spp., *Septoria nodorum*,
15 *Pyrenophora* spp., *Gaeumannomyces graminis*, *Colletotrichum graminicola*, *Claviceps*
purpurea, *Cochliobolus sativus*, *Fusarium graminearum* etc., *Fusarium avenaceum*,
Penicillium spp., *Puccinia sorghi*, *Cochliobolus heterostrophus*, *Ustilago maydis*,
Colletotrichum graminicola, *Cochliobolus carbonum*, *Plasmopara viticola*, *Phakopsora*
ampelopsidis, *Uncinula necator*, *Elsinoe ampelina*, *Glomerella cingulata*, *Guignardia*
20 *bidwellii*, *Phomopsis viticola*, *Zygophiala jamaicensis*, *Botrytis cinerea*, *Diaporthe medusaea*,
Helicobasidium mompa, *Rosellinia necatrix*, *Podosphaera leucotricha*, *Venturia inaequalis*,
Alternaria alternata Apple pathotype, *Gymnosporangium yamadae*, *Monillia mali*, *Valsa*
ceratosperma, *Botryosphaeria berengeriana*, *Colletotrichum acutatum*, *Zygophiala*
jamaicensis, *Gloeodes pomigena*, *Mycosphaerella pomi*, *Helicobasidium mompa*, *Rosellinia*

- necatrix*, *Phomopsis mali*, *Diaporthe tanakae*, *Diplocarpon mali*, *Alternaria alternata*
- Japanese pear pathotype, *Venturia nashicola*, *Gymnosporangium haraeaeum*, *Physalospora*
- piricola*, *Diaporthe medusaea*, *Diaporthe eres*, *Phytophthora cactorum*, *Cladosporium*
- carpophilum*, *Phomopsis* sp., *Phytophthora* sp., *Gloeosporium laeticolor*, *Glomerella*
- 5 *cingulata*, *Monilinia kusanoi*, *Monilinia fructicola*, *Gloeosporium kaki*, *Cercospora kaki*,
- Mycosphaerella nawae*, *Phyllactinia kakikora*, *Diaporthe citri*, *Penicillium digitatum*,
- Penicillium italicum*, *Elsinoe fawcettii*, *Botrytis cinerea*, *Sclerotinia sclerotiorum*,
- Phytophthora* spp., *Sclerotinia sclerotiorum*, *Pseudoperonospora cubensis*, *Sphaerotheca*
- fuliginea*, *Colletotrichum lagenarium*, *Mycosphaerella melonis*, *Fusarium oxysporum*,
- 10 *Phytophthora parasitica*, *Phytophthora melonis*, *Phytophthora nicotianae*, *Phytophthora*
- drechsleri*, *Phytophthora capsica*, *Alternaria solani*, *Cladosporium fulvam*, *Phytophthora*
- infestans*, *Fusarium oxysporum*, *Pythium myriotylum*, *Pythium dissotocum*, *Colletotrichum*
- phomoides*, *Sphaerotheca fuliginea*, *Mycovellosiella natrassii*, *Phytophthora infestans*,
- Phytophthora capsici*, *Alternaria brassicae*, *Alternaria brassicae*, *Cercospora brassica*,
- 15 *Leptosphaeria maculans*, *Plasmodiophora brassicae*, *Peronospora brassicae*, *Fusarium*
- oxysporum*, *Verticillium dahlia*, *Puccinia allii*, *Alternaria porri*, *Sclerotium rolfsii*. *Sclerotium*
- rolfsii*, *Phytophthora porri*, *Cercospora kikuchii*, *sElsinoe glycines*, *Diaporthe phaseololum*,
- Phytophthora megasperma*, *Peronospora manshurica*, *Phakopsora pachyrhizi*,
- Colletotrichum truncatum*, *Colletotrichum lindemuthianum*, *Mycosphaerella personatum*,
- 20 *Cercospora arachidicola*, *Erysiphe pisi*, *Peronospora pisi*, *Peronospora viciae*, *Phytophthora*
- nicotianae*, *Alternaria solani*, *Phytophthora infestans*, *Spondylocadium atrovirens*, *Fusarium*
- oxysporum*, *Fusarium solani*, *Spongospora subterranean*, *Cercospora beticola*, *Peronospora*
- schachtii*, *Aphanomyces cochlioides*, *Phoma betae*, *Alternaria dauci*, *Sphaerotheca humuli*,
- Phytophthora nicotianae*, *Gromerella cingulate*, *Pythium ultimum* Trow var. *ultimum*,

- Exobasidium reticulatum*, *Elsinoe leucospila*, *Colletotrichum theae sinensis*, *Pestalotiopsis longiseta*, *Alternaria alternata* (Tobacco pathotype), *Erysiphe cichoracearum*, *Colletotrichum tabacum*, *Phytophthora parasitica*, *Fusarium oxysporum*, *Sclerotinia sclerotiorum*,
5 *Diplocarpon rosae*, *Sphaerotheca pannosa*, *Phytophthora megasperma*, *Peronospora sparsa*,
Septoria chrysanthemi-indici, *Puccinia horiana*, *Phytophthora cactorum*, *Sclerotinia homoeocarpa*, *Curvularia geniculata*, *Puccinia zoysiae*, *Cochliobolus* sp., *Rhynchosporium secalis*, *Gaeumannomyces graminis*, *Colletotrichum graminicola*, *Typhula incarnata*, *Typhula ishikariensis*, *Sclerotinia borealis*, *Marasmius oreades*, *Pythium aphanidermatum* or *Pyricularia oryzae*.



(I)