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(54) Title: PESTICIDE BENZYLOXY- AND PHENETHYL-SUBSTITUTED PHENYL-AMIDINE DERIVATIVES

(57) Abstract: The present invention relates to benzyloxy- and phenethyl-substituted phenyl-amidine derivatives of formula (I) wherein the substituents are as in the description, their process of preparation, their use as fungicide or insecticide active agents, particularly in the form of fungicide or insecticide compositions, and methods for the control of phytopathogenic fungi or damaging insects, notably of plants, using these compounds or compositions.

![Chemical Structure Formula](image-url)
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PESTICIDE BENZYLOXY- AND PHENETHYL-SUBSTITUTED PHENYL-AMIDINE DERIVATIVES

DESCRIPTION

The present invention relates to novel 4-benzyloxy- and 4-(2-phenylethyl)-substituted phenyl-amidine derivatives, their process of preparation, their use as fungicide or insecticide active agents, particularly in the form of fungicide or insecticide compositions, and methods for the control of phytopathogenic fungi or damaging insects, notably of plants, using these compounds or compositions.

In international patent application WO-00/46184 certain phenyl-amidine derivatives are disclosed. However, this document does not specifically disclose nor suggest to select such compounds wherein the phenyl ring is substituted according to the invention thus allowing an unexpected and significantly higher fungicide or insecticide activity.

It is always of high-interest in agriculture to use novel pesticide compounds in order to avoid or to control the development of resistant strains to the active ingredients. It is also of high-interest to use novel compounds being more active than those already known, with the aim of decreasing the amounts of active compound to be used, whilst at the same time maintaining an effectiveness at least equivalent to the already known compounds.

In the same way, it is also always of high-interest to use novel insecticide, namatocide or acaricide agents to control damaging insects or other damaging organisms.

We have now found a new family of compounds which possess the above mentioned effects or advantages.

Accordingly, the present invention provides bi-phenyl-amidine derivatives of formula (I):

$$\text{(Ia): } X = \text{O} \quad \text{(Ib): } X = \text{CH}_2$$

(I)
wherein

- \( X = \text{O or CH}_2 \);
- \( R^1 \) represents H, a substituted or non substituted d-C\(_{12}\) alky, a substituted or non substituted C\(_2\)-C\(_{12}\) alkenyl, a substituted or non substituted C\(_2\)-C\(_{12}\) alkynyl, SH or a substituted or non substituted S-Ci-Ci alkyl;
- \( R^2 \) represents a substituted or non substituted d-C\(_{12}\) alkyl;
- \( R^3 \) represents a substituted or non substituted C\(_2\)-C\(_{12}\) alkyl, substituted or non substituted C\(_2\)-C\(_{12}\) cydoalkyl, substituted or non substituted C\(_2\)-C\(_{12}\) alkenyl, substituted or non substituted C\(_2\)-C\(_{12}\) alkynyl, halogeno-C-Ci alkyl, halogeno-Ci-C alkyl, halogeno-Ci alkyl or cyan;
- \( R^4 \) represents a substituted or non substituted d-C\(_{12}\) alky, a halogen atom, halogeno-Ci-Ci alkyl, substituted or non substituted O-Ci-Ci alkyl or cyan;
- \( R^5 \) represents H, a substituted or non substituted Cl-Ci alkyl, a halogen atom, halogeno-d-C\(_{12}\) alkyl, substituted or non substituted O-Ci-Ci alkyl or cyan;
- \( R^6 \) represents H, a substituted or non substituted Cl-C\(_6\) alkyl, a halogen atom or halogeno-Ci-C\(_6\) alkyl;
- \( m \) represents 0, 1, 2, 3, 4 or 5;
- \( R^7 \), which may the same or different, represents H, a halogen atom, nitro, cyan, trialkylsilyl, Ci-Ci alkyl, substituted or non-substituted C-Ci alkyl-phenyl, substituted or non-substituted phenyl, d-C\(_4\) alkxy, d-C\(_4\) alkxy d-C\(_4\) alkyl, d-C\(_8\) alkylthio, C\(_1\)-C\(_6\) halogenoalkyl, d-C\(_8\)-halogenoalkoxy or d-C\(_8\)-halogenoalkylthio, substituted or non substituted d-C\(_4\) alkxy-phenyl like benzyloxy, substituted or non substituted phenoxy, substituted, non substituted alkylamino-Ci-C\(_8\)NR\(_8\)R\(_9\), substituted or non substituted NR\(_8\)R\(_9\), d-C\(_8\) alkyl-S(O)\(_{n}\)R\(_{10}\), -S(O)\(_{n}\)R\(_{10}\), d-C\(_8\) alkyl-SO\(_2\)NR\(_8\)R\(_9\), -SO\(_2\)NR\(_8\)R\(_9\), C\(_1\)-C\(_6\) alkyl-C(O)\(_{n}\)R\(_{11}\), -CR\(_{10}\)N-O-R\(_{12}\);
- two substituents \( R^7 \) can form a carbocyclic or heterocyclic ring, which may comprise one or more heteroatoms selected in the list consisting of O, N, S;
- \( n \) represents 0, 1 or 2;
- \( R^8 \) and \( R^9 \), which may the same or different, represent H, substituted or non-substituted d-ds-alkyl;
- \( R^8 \) and \( R^9 \) can form a heterocyclic ring, which may comprise one or more heteroatoms selected in the list consisting of O, N, S;
- \( R^{10} \) represents H, substituted or non-substituted, linear or branched d-C\(_8\) alkyl, C\(_1\)-C\(_6\) alkenyl, d-C\(_8\) alkynyl;
- \( R^{11} \) represents H, substituted or non-substituted, linear or branched d-C\(_8\) alkyl, C\(_1\)-C\(_6\) alkoxy, NR\(_8\)R\(_9\);
• $R_{12}^1$ represents H, substituted or non-substituted, linear or branched Ci-C$_8$-alkyl, CrC$_4$-alkyl-phenyl, Ci-C$_4$-alkoxy-Ci-C$_4$-alkyl, substituted or non-substituted Ci-C$_4$-alkyl-phenyl, substituted or non-substituted phenyl;

• $R_{10}^1$ and $R_{12}^2$ can form a heterocyclic ring, which may comprise one or more heteroatoms selected in the list consisting of O, N, S;

as well as salts, N-oxides, metallic complexes, metalloidic complexes and optically active or geometric isomers thereof.

Any of the compounds according to the invention can exist in one or more optical, geometric or chiral isomer forms depending on the number of asymmetric centres in the compound. The invention thus relates equally to all the optical isomers and to their racemic or scalemic mixtures (the term "scalemic" denotes a mixture of enantiomers in different proportions), and to the mixtures of all the possible stereoisomers, in all proportions. The diastereoisomers and/or the optical isomers can be separated according to the methods which are known *per se* by the man ordinary skilled in the art.

Any of the compounds according to the invention can also exist in one or more geometric isomer forms depending on the number of double bonds in the compound. The invention thus relates equally to all geometric isomers and to all possible mixtures, in all proportions. The geometric isomers can be separated according to general methods, which are known *per se* by the man ordinary skilled in the art.

For the compounds according to the invention, halogen means either one of fluorine, bromine, chlorine or iodine and heteroatom can be nitrogen, oxygen or sulphur.

Preferred compounds of formula (I) according to the invention are those wherein $R^1$ represents H; Ci-Ci$_2$-alkyl, preferably Ci-Ci$_2$-alkyl like methyl; or SH.

Other preferred compounds of formula (I) according to the invention are those wherein $R^2$ represents methyl.

Still other preferred compounds of formula (I) according to the invention are those wherein $R^3$ represents C$_2$-$C_{12}$-alkyl, preferably a non substituted C$_2$-$C_4$-alkyl like ethyl, n-propyl, i-propyl; C$_2$-Ci$_2$-alkenyl, preferably C$_3$-$C_4$-alkenyl like propenyl or allyl; C$_3$-$C_6$-cycloalkyl like cyclopropyl.

Still other preferred compounds of formula (I) according to the invention are those wherein $R^2$ and $R^3$ can form together a substituted or non substituted 5 to 7-membered heterocycle, preferably a 6-membered heterocycle, more preferably a pipiridinyl or a pyrolidinyl, even more preferably a 2-alkylated-pyrolidinyl like a 2-methyl-pyrolidinyl.
Still other preferred compounds of formula (I) according to the invention are those wherein R^4 represents a C=ι-C_12-alkyl, preferably a non substituted C=ι-C_12-alkyl like methyl and ethyl; a halogen atom like a fluorine and a chlorine atom; trifluoromethyl.

Still other preferred compounds of formula (I) according to the invention are those wherein R^5 represents a C=ι-C_12-alkyl, preferably a non substituted C=ι-C_12-alkyl like methyl and ethyl; a halogen atom like a fluorine and a chlorine atom; trifluoromethyl.

Still other preferred compounds of formula (I) according to the invention are those wherein R^6 represents H or a non substituted Cl-C_6-alkyl like methyl and ethyl.

Still other preferred compounds of formula (I) according to the invention are those wherein m represents 1, 2, 3 or 4; even more preferably m represents 1, 2 or 3.

Still other preferred compounds of formula (I) according to the invention are those wherein R^7, which may be the same or different, represents H; F, Cl, Br, I; nitro; cyano; C=t-C_6-alkyl; C_1-r-C_4-alkyl-phenyl which may be non substituted or substituted by halogen, C=t-C_4-alkyl or C_1-r-C_4-halogenoalkyl; phenyl which may be non substituted or substituted by halogen, C=t-C_4-alkyl or C=t-C_4-halogenoalkyl; C=t+C_6-alkoxy; C_1-r-C_2-alkoxy-C_1-r-C_4-alkyl; d-C_6-alkylthio; C_1-r-C_6-alkylthioalkyl; C=t-C_6-halogenoalkyl; C=t-C_6-halogenoalkoxy; C=t-C_6-halogenoalkylthio; C=t+C_6-alkoxy; C_1-r-C_4-alkoxy-C_1-r-C_4-alkyl; C=t-C_6-alkylthio; benzoxyl which may be non substituted or substituted by halogen; phenoxy which may be non substituted or substituted by a halogen atom or CF_3; NR^8R^9; C_1-r-C_4-alkyl-NR^8R^9; S(O)_nR^10; C_1-r-C_4-alkyl-S(O)_nR^10; OR^11; d-C^a-alkyl-COR^11; -CR^10=n-O-R^12.

Still other preferred compounds of formula (I) according to the invention are those wherein R^8 and R^9 which may be the same or different, represent H, Cl-C_6-alkyl or R^8 and R^9 can form a heterocyclic ring comprising further heteroatoms selected in the list consisting of O, S, N.

Still other preferred compounds of formula (I) according to the invention are those wherein R^10 represents H, methyl or ethyl.

Still other preferred compounds of formula (I) according to the invention are those wherein R^11 represents H; C_1-r-C_4-alkyl; C_1-r-C_4-alkoxy; NR^8R^9.

Still other preferred compounds of formula (I) according to the invention are those wherein R^12 represents H; Cl-C_4-alkyl; C=t+C_4-halogenoalkyl; C_1-r-C_4-alkyl-phenyl wherein phenyl may be substituted by F, Cl, Br, I, Cl-C_4-alkyl, C=t+C_4-halogenoalkyl or C=t+C_4-halogenoalkoxy; C_1-r-C_4-alkoxy-C_2-r-C_4-alkyl; phenoxy; benzoyloxy.
Still other preferred compounds of formula (I) according to the invention are those wherein \( R^{10} \) and \( R^{12} \) can form a 5- or 6-membered heterocyclic ring comprising a further heteroatom selected in the list consisting of O, S, N.

The above mentioned preferences with regard to the substituents of the compounds according to the invention can be combined in various manners. These combinations of preferred features thus provide sub-classes of compounds according to the invention. Examples of such subclasses of preferred compounds according to the invention can combine:

- preferred features of \( R^1 \) with preferred features of \( R^2 \) to \( R^7 \) or to \( R^{12} \) where applicable;
- preferred features of \( R^5 \) with preferred features of \( R^1 \) to \( R^7 \) or to \( R^{12} \) where applicable;
- preferred features of \( R^4 \) with preferred features of \( R^1 \) to \( R^7 \) or to \( R^{12} \) where applicable;
- preferred features of \( R^6 \) with preferred features of \( R^1 \) to \( R^7 \) or to \( R^{12} \) where applicable.

In these combinations of preferred features of the substituents of the compounds according to the invention, the said preferred features can also be selected among the more preferred features of each of \( m, n \) and \( R^1 \) to \( R^{12} \) so as to form most preferred subclasses of compounds according to the invention.

The present invention also relates to a process for the preparation of a compound of formula (Ia). Generally, the preparation of compound of formula (Ia) according to the invention can be carried out as illustrated by scheme 1.
The present invention also relates to a process for the preparation of a compound of formula (Ib). Generally, the preparation of compound of formula (Ib) according to the invention can be carried out as illustrated by scheme 2.

Scheme 1
Thus according to a further aspect according to the invention, there is provided a process (a) for the preparation of aniline derivatives of formulae (Ia) or (IV) by reacting aniline derivatives of formulae (II) or (III)
wherein
• $R_1, R_2, R_3, R_4$ and $R_5$ are as herein-defined
with a benzylic derivative (IV)

\[
\begin{array}{c}
\text{NH}_2 \\
R^4 \\
\text{OH} \\
R^5
\end{array}
\]

(II)

\[
\begin{array}{c}
R^2 \\
N \\
R^3 \\
\text{N}\equiv R^1 \\
R^4 \\
\text{OH} \\
R^5
\end{array}
\]

(III)

wherein
• $m, R^6$ and $R^7$ are as herein-defined;
• $X$ represents Cl, Br, I, tosylate, SOMe, mesylate or triflate.

Process (a) according to the invention can further comprise one or more of the following characteristics:
• presence of a base;
• presence of an inert organic diluent.

For carrying out process (a) according to the invention, aniline or amidine derivatives of formulae (II) or (III) respectively can be used as starting materials. Preferred starting materials for process (a) according to the invention are compounds of formulae (II) or (III) wherein $R^1, R^2, R^3, R^4$ and $R^5$ represent substituents as herein-defined for preferred compound of formula (I) according to the invention.
Aniline derivatives of formula (II) and benzylic compounds of formula (IX), as well as respective process for their preparation are known.

Formula (IX) provides a general definition of the benzylic compounds that can be used as starting materials for carrying out process (a) according to the invention. In formula (IX), $R^6$, $R^7$ and $m$ represent preferably substituents which have already been described as preferred in connection with compounds of formula (I).

A further aspect according to the invention lies in a process (b) for the preparation of aniline derivatives of formulae (XII) or (XIII) by reacting aniline derivatives of formulae (X) or (XI)

wherein
- $R^1$, $R^2$, $R^3$, $R^4$ and $R^5$ are as herein-defined
- $X$ represents Cl, Br, I, triflate, mesylate, SOMe or tosylate

with a styrene derivative of formula (XV)
wherein

- $m$, $R_6$, and $R_7$ are as herein-defined.

Process (b) according to the invention can further comprise one or more of the following characteristics:

- presence of a base;
- presence of an inert organic diluent;
- presence of a catalyst;
- presence of a ligand;
- presence of additives.

For carrying out process (b) according to the invention, aniline or amidine derivatives of formulae (VI) or (VII) respectively can be used as starting materials.

Preferred starting materials for process (b) according to the invention are compounds of formulae (X) or (XI) wherein $R_1$, $R_2$, $R_3$, $R_4$ and $R_5$ represent substituents as herein-defined for preferred compound of formula (I) according to the invention.

Aniline derivatives of formula (X) and styrene derivatives of formula (XV), as well as respective process for their preparation are known.

Formula (XV) provides a general definition of the styrene derivatives that can be used as starting materials for carrying out process (a) according to the invention. In formula (XV), $R_6$, $R_7$ and $m$ represent preferably substituents which have already been described as preferred in connection with compounds of formula (I).

A further aspect according to the invention lies in a process (c) for the preparation of the aniline derivatives of formulae (XIV) or (Ib) by reacting aniline derivatives of formulae (XII) or (XIII)
wherein

• m, R⁶ and R⁷ are as herein-defined;

with a source of hydrogen, preferably hydrogen itself.

Process (c) according to the invention can further comprise one or more of the following characteristics:

• presence of an inert organic diluent;

• presence of an acid or a base;

• presence of a catalyst.

For carrying out process (c) according to the invention, aniline or amidine derivatives of formulae (XII) or (XIII) respectively can be used as starting materials.

Preferred starting materials for process (c) according to the invention are compounds of formulae (XII) or (XIII) wherein R¹, R², R³, R⁴, R⁵, R⁶ and R⁷ represent substituents as herein-defined for preferred compound of formula (I) according to the invention.

Amidine derivatives of formulae (Ia), (Ib), (III) and (XI) can be obtained by a further process according to the invention. Various alternatives of process (d) according to the invention can be considered, they are defined as process (d1), process (d2) and process (d3) according to the invention.

Process (d) according to the invention comprises reacting aniline derivatives of formulae (II), (IV), (X) or (XIV) with different reagents thus defining processes (d1), (d2) and (d3) respectively.
wherein
- $R^4$, $R^5$, $R^6$, $R^7$ and $m$ are as herein-defined;
- $X$ represents halogen, triflate, SOMe, mesylate or tosylate.

5 Process (d1) is carried out further using amide derivatives of formula (V)

$$\begin{align*}
\text{O} & \text{W} \\
\text{R}^1 & \text{V}^3
\end{align*}$$

(V)

wherein
- $R^1$, $R^2$, $R^3$ are as herein-defined.

10 Process (d1) according to the invention can further comprise one or more of the following characteristics:
- presence of a halogenation agent, like $\text{PCI}_5$, $\text{PCI}_3$, $\text{POCl}_3$, $\text{SOCl}_2$;
- presence of a diluent.

15 Process (d2) is carried out further using amino-acetal derivatives of formula (VI)

$$\begin{align*}
\text{R}^2 & \text{N} & \text{R}^3 \\
\text{O} & \text{B}^1 & \text{B}^2
\end{align*}$$

(VI)

wherein
- $R^1$, $R^2$, $R^3$ are as herein-defined;
- $B^1$ and $B^2$ represent each alkyl or together cycloalkyl.

Process (d2) according to the invention can further comprise one or more of the following characteristics:
- presence of an acid or a base.
- presence of a diluent.

20 Process (d3) is carried out further using amine derivatives of formula (VIII)

$$\begin{align*}
\text{N-R}^2 \\
\text{R}^3
\end{align*}$$

(VIII)

wherein
- $R^2$ and $R^3$ are as herein-defined.

in presence of orthoester derivatives of formula (VII)
wherein

• \( R^1 \) is as herein-defined;
• \( B^1, B^2 \) and \( B^3 \) represent each alkyl.

Formulae (II), (IV), (X) or (XIV) provide general definitions of the aniline derivatives useful as starting materials for carrying out the processes (d1), (d2) and (d3) according to the invention. In these formulae \( R^1, R^2, R^3, R^4, R^6, R^7 \) and \( m \) preferably represent substituents or values as herein-defined in connection with the description of compounds of formula (I) according to the invention.

Processes (d), (d1), (d2) or (d3) according to the invention can further comprise one or more of the following characteristics:

• presence of an acid or a base;
• presence of a diluent.

Suitable diluents for carrying out process (a) according to the invention are all customary inert organic solvents. Preference is given to using aliphatic, alicyclic or aromatic hydrocarbons, such as petroleum ether, hexane, heptane, cyclohexane, methylcyclohexane, benzene, toluene, xylene or decalin; halogenated hydrocarbons, such as chlorobenzene, dichlorobenzene, dichloromethane, chloroform, carbon tetrachloride, dichloroethane or trichloroethane; ethers, such as diethyl ether, diisopropyl ether, methyl tert-butyl ether, methyl tert-amyl ether, dioxane, tetrahydrofuran, 1,2-dimethoxyethane, 1,2-diethoxyethane or anisole; nitriles, such as acetonitrile, propionitrile, n- or iso-butynitrile or benzonitrile; amides, such as N,N-dimethylformamide, N,N-dimethylacetamide, N-methylformanilide, N-methylpyrrolidone or hexamethylphosphoric triamide.

Suitable diluents for carrying out process (b) according to the invention are all customary inert organic solvents. Preference is given to using aliphatic, alicyclic or aromatic hydrocarbons, such as petroleum ether, hexane, heptane, cyclohexane, methylcyclohexane, benzene, toluene, xylene or decalin; halogenated hydrocarbons, such as chlorobenzene, dichlorobenzene, dichloromethane, chloroform, carbon tetrachloride, dichloroethane or trichloroethane; ethers, such as diethyl ether, diisopropyl ether, methyl tert-butyl ether, methyl tert-amyl ether, dioxane, tetrahydrofuran, 1,2-dimethoxyethane, 1,2-diethoxyethane or anisole; nitriles, such as
acetonitrile, propionitrile, n- or iso-butyronitrile or benzonitrile; amides, such as N,N-dimethylformamide, N,N-dimethylacetamide, N-methylformanilide, N-methylpyrrolidone or hexamethylphosphoric triamide, esters, such as methyl acetate or ethyl acetate; sulphones, such as dimethylsulphoxide; or sulphones, such as sulpholane; alcohols, such as methanol, ethanol, n- or iso-propanol, n-, iso-, sec- or tert-butanol, ethanediol, propane-1,2-diol, ethoxyethanol, methoxyethanol, diethyleneeglycolmonomethylether, diethyleneeglycolmonoethyl ether; mixtures thereof with water or pure water.

Suitable diluents for carrying out process (c) according to the invention are customary inert organic solvents. Preference is given to using aliphatic, alicyclic or aromatic hydrocarbons, such as petroleum ether, hexane, heptane, cyclohexane, methylcyclohexane, benzene, toluene, xylene or decalin; ethers, such as diethyl ether, diisopropyl ether, methyl tert-butyl ether, methyl tert-amyl ether, dioxane, tetrahydrofuran, 1,2-dimethoxyethane, 1,2-diethoxyethane or anisole; nitriles, such as acetonitrile, propionitrile, n- or iso-butyronitrile or benzonitrile; amides, such as N,N-dimethylformamide, N,N-dimethylacetamide, N-methylformanilide, N-methylpyrrolidone or hexamethylphosphoric triamide; esters, such as methyl acetate or ethyl acetate; sulphones, such as dimethylsulphoxide; or sulphones, such as sulpholane; alcohols, such as methanol, ethanol, n- or iso-propanol, n-, iso-, sec- or tert-butanol, ethanediol, propane-1,2-diol, ethoxyethanol, methoxyethanol, diethyleneeglycolmonomethylether, diethyleneeglycolmonoethyl ether; mixtures thereof with water or pure water.

Suitable diluents for carrying out the processes (d1), (d2) and (d3) according to the invention are in each case all customary inert organic solvents. Preference is given to using aliphatic, alicyclic or aromatic hydrocarbons, such as petroleum ether, hexane, heptane, cyclohexane, methylcyclohexane, benzene, toluene, xylene or decalin; ethers, such as diethyl ether, diisopropyl ether, methyl tert-butyl ether, methyl tert-amyl ether, dioxane, tetrahydrofuran, 1,2-dimethoxyethane, 1,2-diethoxyethane or anisole; nitriles, such as acetonitrile, propionitrile, n- or iso-butyronitrile or benzonitrile; amides, such as N,N-dimethylformamide, N,N-dimethylacetamide, N-methylformanilide, N-methylpyrrolidone or hexamethylphosphoric triamide; esters, such as methyl acetate or ethyl acetate; sulphones, such as dimethylsulphoxide; or sulphones, such as sulpholane; alcohols, such as methanol, ethanol, n- or iso-propanol, n-, iso-, sec- or tert-butanol, ethanediol, propane-1,2-diol, ethoxyethanol, methoxyethanol, diethyleneeglycolmonomethylether, diethyleneeglycolmonoethyl ether; mixtures thereof with water or pure water.

Suitable acid binders for carrying out process (a) are all inorganic and organic bases customary for such reactions. Preference is given to using alkaline earth metal or alkali metal hydrides, carbonates or hydrogen carbonates, phosphates or fluorides, such as sodium hydride, sodium carbonate, potassium carbonate, caesium carbonate, potassium bicarbonate, sodium bic-
carbonate, sodium phosphate, potassium phosphate, or ammonium carbonate; and also tertiary amines, such as trimethylamine, triethylamine, tributylamine, N,N-dimethylaniline, N,N-dimethylbenzylamine, pyridine, N-methylpiperidine, N-methylmorpholine, N,N-dimethylaminopyridine, diazabicyclocooctane (DABCO), diazabicyclononene (DBN) or di-azabicycloundecene (DBU).

Suitable acid binders for carrying out process (b) are all inorganic and organic bases customary for such reactions. Preference is given to using alkaline earth metal or alkali metal alcoholates, carbonates or phosphates, such as potassium tert-butanolate, sodium carbonate, potassium carbonate, caesium carbonate, sodium phosphate, potassium phosphate, and also tertiary amines, such as trimethylamine, triethylamine, tributylamine, dicyclohexylamin, dicyclohexylmethylamin or diazabicyclooctane (DABCO).

Suitable acid binders for carrying out the processes (c) and (d) according to the invention are in each case all inorganic and organic bases customary for such reactions. Preference is given to using alkaline earth metal or alkali metal hydrides, hydroxides, amides, alcoholates, acetates, fluorides, phosphates, carbonates or hydrogen carbonates, such as sodium hydride, sodium amide, lithium disopropylamide, sodium methanolate, sodium ethanolate, potassium tert-butanolate, sodium hydroxide, potassium hydroxide, sodium acetate, sodium phosphate, potassium phosphate, potassium fluoride, caesium fluoride, sodium carbonate, potassium carbonate, potassium hydrogen carbonate, sodium hydrogen carbonate or caesium carbonate; and also tertiary amines, such as trimethylamine, triethylamine, tributylamine, N,N-dimethylaniline, N,N-dimethylbenzylamine, pyridine, N-methylpiperidine, N-methylmorpholine, N,N-dimethylaminopyridine, diazabicyclooctane (DABCO), diazabicyclononene (DBN) or diazabicycloundecene (DBU).

Suitable acids for carrying out the process (d3) according to the invention are all inorganic and organic acids customary for such reactions. Preference is given to using para-toluene sulfonic acid, methane sulfonic acid, hydrochloric acid (gas, aqueous or organic solution) or sulphuric acid.

Suitable condensing agents for carrying out the process (d1) according to the invention are all condensing agents customary for such amidation reactions. Preference is given to using acid halide former, such as phosgene, phosphorous tribromide, phosphorous trichloride, phosphorous pentachloride, phosphorous trichloride oxide or thionyl chloride; anhydride former, such as ethyl chloroformate, methyl chloroformate, isopropyl chloroformate, isobutyl chloroformate or methanesulfonyl chloride; carbodiimides, such as N,N'-dicyclohexylcarbodiimide (DCC) or other customary condensing agents, such as phosphorous pentoxide, polyphosphoric acid, N,N'-carboxyldiimidazole, 2-ethoxy-N-ethoxycarbonyl-1,2-
dihydroquinoline (EEDQ), triphenylphosphine/tetrachloromethane or bromo-tri pyrroli dine phosphonium-hexafluorophosphate.

Process (b) according to the invention can be carried out in the presence of a catalyst. Preference is given to palladium salts or complexes, such as palladium chloride, palladium acetate, bis-(dibenzyldienacetone)-palladium, tris-(dibenzyldienacetone)-bis-palladium, tetrakis-(triphenylphosphine) palladium, bis-(triphenylphosphine) palladium dichloride or 1,1'-Bis(diphenylphosphino)ferrocene palladium(II) chloride.

It is also possible to generate a palladium complex directly in the reaction mixture by separately adding to the reaction mixture a palladium salt and a complex ligand, such as triethylphosphane, tri-tert-butylphosphane, tricyclohexylphosphane, 2-(dicyclohexylphosphane)biphenyl, 2-(di-tert-butylphosphane)biphenyl, 2-(dicyclohexylphosphane)-2'-(N,N-dimethylamino)-biphenyl, triphenylphosphane, tris-(o-toly)phosphane, sodium 3-(diphenylphosphino)benzolsulfonate, tris-2-(methoxyphenyl)phosphane, 2,2'-bis-(diphenylphosphane)-1',1'-binaphthyl, 1,4-bis-(diphenylphosphane)butane, 1,2-bis-(diphenylphosphane)ethane, 1,4-bis-(dicyclohexylphosphane)butane, 1,2-bis-(dicyclohexylphosphane)ethane, 2-(dicyclohexylphosphane)-2'-(N,N-dimethylamino)-biphenyl, bis(diphenylphosphino)ferrocene or tris-(2,4-tert-butylphenyl)-phosphate.

Process (b) according to the invention can be carried out in the presence of an additive such as alkali metal salts as lithium chloride or sodium chloride or potassium chloride or a silver salt such as silver carbonate, silver phosphate, silver nitrate, silver acetate or silver triflate or a thallium salt such as thallium carbonate or thallium acetate or a phase transfer catalyst such as tetrabutylammonium bromide or tetrabutylammonium acetate.

Process (c) according to the invention can be carried out in the presence of a catalyst. Preference is given to metals like platinum, palladium, nickel, rhodium, iridium and ruthenium, preferably adsorbed on a solid support like carbon, alumina, calcium sulphate or barium sulphate; oxides or hydroxides of platinum, palladium, nickel, rhodium, iridium and ruthenium or soluble complexes thereof, like Wilkinson’s catalyst or Vaska’s catalyst.

When carrying out processes (a), (b), (c) and (d) according to the invention, the reaction temperatures can in each case be varied within a relatively wide range. In general, the processes are carried out at temperatures from 0°C to 180°C, preferably from 10°C to 150°C, particularly preferably from 20°C to 120°C.

When carrying out process (a) according to the invention, in general 0.5 to 15 mole, preferably from 0.8 to 8 mole, of benzylid derivative of formula (IX) and from 1 to 5 mol of acid binder and are employed per mole of amine or amidine of formula (II) or (III). However, it is also possible to
employ the reaction components in other ratios. Work-up is carried out by customary methods. In general, water is added to the reaction mixture and the precipitate is separated off and dried. The residue that remains may, if appropriate, be freed of any impurities that may still be present using customary methods, such as chromatography or recrystallization.

When carrying out process (b) according to the invention, in general 0.8 to 15 mole, preferably from 0.8 to 8 mole of styrene (XV) and from 1 to 10 mol of acid binder and from 0.5 to 10 mole% of a catalyst and from 0.5 to 20 mole% of a ligand are employed per mole of amine or amidine of formula (X) or (XI). However, it is also possible to employ the reaction components in other ratios. Work-up is carried out by customary methods. In general, water is added to the reaction mixture and the precipitate is separated off and dried. The residue that remains may, if appropriate, be freed of any impurities that may still be present using customary methods, such as chromatography or recrystallization.

When carrying out process (c) according to the invention, in general 0.5 to 10 mol-% of catalyst are employed per mole of of amine or amidine of formula (XII) or (XIII). However, it is also possible to employ the reaction components in other ratios. Work-up is carried out by customary methods. In general, the catalyst is filtered off and the residue that remains may, if appropriate, be freed of any impurities that may still be present using customary methods, such as chromatography or recrystallization.

When carrying out process (d1) according to the invention, per mole of the amine of formula (II), (IV), (X) or (XIV) in general 0.8 to 50 mole, preferably 1 to 10 mole of amide of formula (V) and 1 to 10 mole of halogenation agent are employed. However, it is also possible to employ the reaction components in other ratios. Work-up is carried out by customary methods.

When carrying out process (d2) according to the invention, per mole of the amine of formula (II), (V), (VI) or (XI) in general 0.8 to 50 mole, preferably 1 to 10 mole of an aminoacetal of formula (VI) are employed. However, it is also possible to employ the reaction components in other ratios. Work-up is carried out by customary methods.

When carrying out process (d3) according to the invention, per mole of the amine of formula (II), (IV), (X) or (XIV) in general 0.8 to 50 mole, preferably 1 to 10 mole of an orthoester of formula (VII) and 0.8 to 50 mole, preferably 1 to 10 mole of an amine of formula (VIII) and a catalytic amount of acid are employed. However, it is also possible to employ the reaction components in other ratios. Work-up is carried out by customary methods.
All processes according to the invention are generally carried out under atmospheric pressure. However, in each case it is also possible to operate under elevated or reduced pressure, in general between 0.1 bar and 10 bar.

Process (b) according to the invention is generally carried out under an inert gas atmosphere such nitrogen or argon, process (c) under hydrogen atmosphere.

Compounds of formula (I) according to the invention can be prepared according to the herein described processes. It will nevertheless be understood that, on the basis of his general knowledge and of available publications, the skilled worker will be able to adapt these processes according to the specifics of each of the compounds which it is desired to synthesise.

In a further aspect, the present invention also relates to a fungicide or insecticide composition comprising an effective and non-phytotoxic amount of an active compound of formula (I).

The expression "effective and non-phytotoxic amount" means an amount of composition according to the invention which is sufficient to control or destroy the fungi present or liable to appear on the crops, and which does not entail any appreciable symptom of phytotoxicity for the said crops. Such an amount can vary within a wide range depending on the fungus to be controlled, the type of crop, the climatic conditions and the compounds included in the fungicide composition according to the invention.

This amount can be determined by systematic field trials, which are within the capabilities of a person skilled in the art.

Thus, according to the invention, there is provided a fungicide or insecticide composition comprising, as an active ingredient, an effective amount of a compound of formula (I) as herein-defined and an agriculturally acceptable support, carrier or filler.

According to the invention, the term "support" denotes a natural or synthetic, organic or inorganic compound with which the active compound of formula (I) is combined or associated to make it easier to apply, notably to the parts of the plant. This support is thus generally inert and should be agriculturally acceptable. The support may be a solid or a liquid. Examples of suitable supports include clays, natural or synthetic silicates, silica, resins, waxes, solid fertilisers, water, alcohols, in particular butanol, organic solvents, mineral and plant oils and derivatives thereof.

Mixtures of such supports may also be used.

The composition according to the invention may also comprise additional components. In particular, the composition may further comprise a surfactant. The surfactant can be an emulsifier, a dispersing agent or a wetting agent of ionic or non-ionic type or a mixture of such
surfactants. Mention may be made, for example, of polyacrylic acid salts, lignosulphonic acid salts, phenol sulphonic or naphthalenesulphonic acid salts, polycondensates of ethylene oxide with fatty alcohols or with fatty acids or with fatty amines, substituted phenols (in particular alkylphenols or arylphenols), salts of sulphasuccinic acid esters, taurine derivatives (in particular alkyl taurates), phosphoric esters of polyoxyethylated alcohols or phenols, fatty acid esters of polyols, and derivatives of the present compounds containing sulphate, sulphonate and phosphate functions. The presence of at least one surfactant is generally essential when the active compound and/or the inert support are water-insoluble and when the vector agent for the application is water. Preferably, surfactant content may be comprised from 5% to 40% by weight of the composition.

Optionally, additional components may also be included, e.g. protective colloids, adhesives, thickeners, thixotropic agents, penetration agents, stabilisers, sequestering agents. More generally, the active compounds can be combined with any solid or liquid additive, which complies with the usual formulation techniques.

In general, the composition according to the invention may contain from 0.05 to 99% by weight of active compound, preferably 10 to 70% by weight.

Compositions according to the invention can be used in various forms such as aerosol dispenser, bait (ready for use), bait concentrate, block bait, capsule suspension, cold fogging concentrate, dustable powder, emulsifiable concentrate, emulsion oil in water, emulsion water in oil, encapsulated granule, fine granule, flowable concentrate for seed treatment, gas (under pressure), gas generating product, grain bait, granular bait, granule, hot fogging concentrate, macrogranule, microgranule, oil dispersible powder, oil miscible flowable concentrate, oil miscible liquid, paste, plant rodlet, plate bait, powder for dry seed treatment, scrap bait, seed coated with a pesticide, smoke candle, smoke cartridge, smoke generator, smoke pellet, smoke rodlet, smoke tablet, smoke tin, soluble concentrate, soluble powder, solution for seed treatment, suspension concentrate (= flowable concentrate), tracking powder, ultra low volume (ulv) liquid, ultra low volume (ulv) suspension, vapour releasing product, water dispersible granules or tablets, water dispersible powder for slurry treatment, water soluble granules or tablets, water soluble powder for seed treatment and wettable powder.

These compositions include not only compositions which are ready to be applied to the plant or seed to be treated by means of a suitable device, such as a spraying or dusting device, but also concentrated commercial compositions which must be diluted before application to the crop.
The compounds according to the invention can also be mixed with one or more insecticide, fungicide, bactericide, attractant, acaricide or pheromone active substance or other compounds with biological activity. The mixtures thus obtained have a broadened spectrum of activity.

The mixtures with other fungicide compounds are particularly advantageous. Examples of suitable fungicide mixing partners may be selected in the following lists:

B1) a compound capable to inhibit the nucleic acid synthesis like benalaxyl, benalaxyl-M, bupirimate, chiralaxyl, clozylacon, dimethirimol, ethirimol, furalaxyl, hymexazol, metalaxyl, metalaxyl-M, ofurace, oxadixyl, oxolinic acid;

B2) a compound capable to inhibit the mitosis and cell division like benomyl, carbendazim, diethofencarb, fuberidazole, pencycuron, thiabendazole thiophanate-methyl, zoxamide;

B3) a compound capable to inhibit the respiration for example as Cl-respiration inhibitor like diflumetorim;

as CII-respiration inhibitor like boscalid, carboxin, fenfuram, flutolanil, furametpyr, mepronil, oxycarboxine, pentiopyrad, thifluzamide;

as CIII-respiration inhibitor like azoxystrobin, cyazofamid, dimoxystrobin, enestrobin, famoxadone, fenamidone, fluoxastrobin, kresoxim-methyl, metominostrobin, orysastrobilin, pyraclostrobil, picoxystrobin, trifloxystrobin;

B4) a compound capable of to act as an uncoupler like dinocap, fluazinam;

B5) a compound capable to inhibit ATP production like fentin acetate, fentin chloride, fentin hydroxide, silthiofam;

B6) a compound capable to inhibit AA and protein biosynthesis like andoprim, blasticidin-S, cyprodinil, kasugamycin, kasugamycin hydrochloride hydrate, mepanipyrim, pyrimethanil;

B7) a compound capable to inhibit the signal transduction like fenpiclonil, fludioxonil, quinoxyfen;

B8) a compound capable to inhibit lipid and membrane synthesis like chlozolinate, iprodione, procymidone, vinclozolin, pyrazophos, edifenphos, iprobenfos (IBP), isoprothiolane, tolclofos-methyl, biphenyl, iodocarb, propamocarb, propamocarb-hydrochloride;
B9) a compound capable to inhibit ergosterol biosynthesis like fenhexamid, azaconazole, bitertanol, bromuconazole, cyproconazole, diclobutrazole, difenoconazole, diniconazole, diniconazole-M, epoxiconazole, etaconazole, fenbuconazole, fluquinconazole, flusilazole, flutriafol, furconazole, furconazole-cis, hexaconazole, imibenconazole, ipconazole, metconazole, myclobutanil, paclobutrazol, pentconazole, propiconazole, prothioconazole, simeconazole, tebuconazole, tetraconazole, triadimefon, triadimenol, triticonazole, uniconazole, voriconazole, imazalil, imazalil sulfate, oxpoconazole, fenarimol, flurprimidol, naurimol, pyrifenox, triforine, pefurazoate, prochloraz, triflumizole, viniconazole, aldormorph, dodemorph acetate, fenpropimorph, tridemorph, fenpropidin, spiroxamine, naftilone, pyributicarb, terbinafine.

B10) a compound capable to inhibit cell wall synthesis like benthiavalicarb, bialaphos, dimethomorph, flumorph, iprovalicarb, polyoxins, polyoxorim, validamycin A.

B11) a compound capable to inhibit melanine biosynthesis like carpropamid, diclocymet, fenoxanil, phtalide, pyroquilon, tricyclazole.

B12) a compound capable to induce a host defence like acibenzolar-S-methyl, probenazole, tiadinil.

B13) a compound capable to have a multisite action like captan, captan chloride, copper preparations such as copper hydroxide, copper naphthenate, copper oxychloride, copper sulphate, copper oxide, oxine-copper and Bordeaux mixture, dichlofluanid, dithianon, dodine, dodine free base, ferbam, fluorofolpet, folpet, guazatine, guazatine acetate, iminoctadine, iminoctadine albesilate, iminoctadine triacetate, mancopper, mancozeb, maneb, metiram, metiram zinc, propineb, sulphur and sulphur preparations including calcium polysulphide, thiram, tolylfluanid, zineb, ziram.

B14) a compound selected in the following list: amibromdole, benthiazole, bethoxazin, capsimycin, carvone, chinomethionat, chloropicrin, cufraneb, cyfluconazole, cyloxanil, dalfoxem, debacarb, diclomezine, dichlorophen, dicloran, difenzoquat, difenzoquat methylsulphate, diphenylamine, ethaboxam, ferimzone, fluometover, flusulfamide, fosetyl-aluminium, fosetyl-calcium, fosetyl-sodium, fluopicolide, fluoroimide, hexachlorobenzene, 8-hydroxyquinoline sulfate, irumamydn, methasulphocarb, metrafenone, methyl isothiocyanate, mildiomycin, natamycin, nickel dimethyldithiocarbamate, nitrothal-isopropyl.octhilinone, oxamocarb, oxyfenthin, pentachlorophenol and salts, 2-phenylphenol and salts, phosphorous acid and its salts, piperalin, propanosine-sodium, proquinazid, pyrrolnitrine, quintozene, teoditadam, tecnazene, triazolexide, trichloramide, zarilamid and 2,3,5,6-tetrachloro-4-(methylsulfonyl)-pyridine, N-(4-Chloro-2-nitrophenyl)-N-ethyl-4-methyl-benzenesulfonamide, 2-amino-4-methyl-N-phenyl-5-thiazolecarboxamide, 2-chloro-N-(2,3-dihydro-1,1,3-trimethyl-1H-inden-4-yl)-3-
pyridincarboxamide, 3-[5-(4-chlorophenyl)-2,3-dimethylisoxazolidin-3-yl]pyridine, cis-1-(4-chlorophenyl)-2-(1H-1,2,4-triazole-1-yl)-cycloheptanone, methyl 1-(2,3-dihydro-2,2-dimethyl-1H-inden-1-yl)-1H-imidazole-5-carboxylate, 3,4,5-trichloro-2,6-pyridinedicarbonitrile, Methyl 2-[[cyclopropyl[(4-methoxyphenyl)imino]methyl][thio][methyl]alpha.-([methoxymethylene]benzeneacetate, 4-Chloro-alpha-propynyloxy-N-[2-[3-methoxy-4-(2-propynyloxy)phenyl]ethyl]-benzeneacetamide, (2S)-N-[2-[4-[[3-(4-chlorophenyl)-2-propynyl]oxy]phenyl]ethyl]-2,4-dichloronicotinamide, N-(3',4'-dichloro-5-fluorobiphenyl-2-yl)ethyl]-2,4-dichloronicotinamide, N-(5-bromo-3-chloropyridin-2-yl)ethyl]-2,4-dichloronicotinamide, 2-butoxy-6-iodo-3-propyl-benzopyranon-4-one, N-[(Z)-[[cyclopropylmethoxy]imino][6-(difluoromethoxy)-2,3-difluorophenyl]methyl]-2-phenylacetamide, N-(3-ethyl-3,5,5-trimethyl-cyclohexyl)-3-formylamino-2-hydroxy-benzamide, 2-[[[1-[3(1Fluoro-2-phenylethyl)oxy]phenyl]ethylidene]amino]oxy[methyl]-alpha-(methoxyimino)-N-methyl-alphaE-benzeneacetamide, N-2-[3-chloro-5-(trifluoromethyl)pyridin-2-yl]ethyl]-2-(trifluoromethyl)benzamide, N-(3',4'-dichloro-5-fluorobiphenyl-2-yl)-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide, 2-[2-[[6-(3-chloro-2-methylphenoxy)-5-fluoropyrimidin-4-yl]oxy]phenyl]-2-(methoxyimino)-N-methylacetamide, 1-[4-(methoxyphenoxy)methyl]-2,2-dimethylpropyl-1H-imidazole-1-carboxylic acid, O-[1-[4-(methoxyphenoxy)methyl]-2,2-dimethylpropyl]-1H-imidazole-1-carboxothioic acid.

The composition according to the invention comprising a mixture of a compound of formula (I) with a bactericide compound may also be particularly advantageous. Examples of suitable bactericide mixing partners may be selected in the following list: bronopol, dichlorophen, nitrapyrin, nickel dimethylthiocarbamate, kasugamycin, ochthilone, furancarboxylic acid, oxytetracycline, probenazole, streptomycin, tedaftalam, copper sulphate and other copper preparations.

The compound of formula (I) and the fungicide composition according to the invention can be used to curatively or preventively control the phytopathogenic fungi of plants or crops. Thus, according to a further aspect of the invention, there is provided a method for curatively or preventively controlling the phytopathogenic fungi of plants or crops characterised in that a compound of formula (I) or a fungicide composition according to the invention is applied to the seed, the plant or to the fruit of the plant or to the soil wherein the plant is growing or wherein it is desired to grow.

In the same manner, the compound of formula (I) and the insecticide composition according to the invention can be used to curatively or preventively control damaging insects, notably of
plants or crops. Thus, according to a further aspect of the invention, there is provided a method for curatively or preventively controlling damaging insects, notably of plants or crops, characterised in that a compound of formula (I) or an insecticide composition according to the invention is applied to the seed, the plant or to the fruit of the plant or to the soil wherein the plant is growing or wherein it is desired to grow.

The methods of treatment according to the invention may also be useful to treat propagation material such as tubers or rhizomes, but also seeds, seedlings or seedlings pricking out and plants or plants pricking out. These methods of treatment can also be useful to treat roots. The methods of treatment according to the invention can also be useful to treat the overground parts of the plant such as trunks, stems or stalks, leaves, flowers and fruit of the concerned plant.

Among the plants that can be protected by the method according to the invention, mention may be made of cotton; flax; vine; fruit or vegetable crops such as Rosaceae sp. (for instance pip fruit such as apples and pears, but also stone fruit such as apricots, almonds and peaches), Ribesioidae sp., Juglandaceae sp., Betulaceae sp., Anacardiaceae sp., Fagaceae sp., Moraceae sp., Oleaceae sp., Actinidaceae sp., Lauraceae sp., Musaceae sp. (for instance banana trees and plantins), Rubiaceae sp., Theaceae sp., Sterculiceae sp., Rutaceae sp. (for instance lemons, oranges and grapefruit); Solanaceae sp. (for instance tomatoes), Æ liaceae sp., Asteraceae sp. (for instance lettuces), Umbelliferae sp., Cruciferae sp., Chenopodiaceae sp., Cucurbitaceae sp., Papilionaceae sp. (for instance peas), Rosaceae sp. (for instance strawberries); major crops such as Graminae sp. (for instance maize, lawn or cereals such as wheat, rice, barley and triticale), Asteraceae sp. (for instance sunflower), Cruciferae sp. (for instance colza), Fabaceae sp. (for instance peanuts), Papilionaceae sp. (for instance soybean), Solanaceae sp. (for instance potatoes), Chenopodiaceae sp. (for instance beetroots); horticultural and forest crops; as well as genetically modified homologues of these crops.

Among the diseases of plants or crops that can be controlled by the method according to the invention, mention may be made of:

Powdery mildew diseases such as:
- Blumeria diseases, caused for example by Blumeria graminis;
- Podosphaera diseases, caused for example by Podosphaera leucotricha;
- Sphaerotheca diseases, caused for example by Sphaerotheca fulginea;
- Uncinula diseases, caused for example by Uncinula necator;

Rust diseases such as:
- Gymnosporangium diseases, caused for example by Gymnosporangium sabinae;
- Hemileia diseases, caused for example by Hemileia vastatrix;
- Phakopsora diseases, caused for example by Phakopsora pachyrhizi or Phakopsora meibomiae;
Pucdnia diseases, caused for example by *Puccinia recondita*;
Uromyces diseases, caused for example by *Uromyces appendiculatus*;

Oomycete diseases such as:

- Bremia diseases, caused for example by *Bremia lactucae*;
- Peronospora diseases, caused for example by *Peronospora pisi* or *P. brassicae*;
- Phytophthora diseases, caused for example by *Phytophthora infestans*;
- Plasmopara diseases, caused for example by *Plasmopara viticola*;
- Pseudoperonospora diseases, caused for example by *Pseudoperonospora humuli* or *Pseudoperonospora cubensis*;
- Pythium diseases, caused for example by *Pythium ultimum*;

Leaf spot, leaf blotch and leaf blight diseases such as:

- Alternaria diseases, caused for example by *Alternaria solani*;
- Cercospora diseases, caused for example by *Cercospora beticola*;
- Cladosporium diseases, caused for example by *Cladosporium cucumerinum*;
- Cochliobolus diseases, caused for example by *Cochliobolus sativus*;
- Colletotrichum diseases, caused for example by *Colletotrichum lindemuthianum*;
- Cycloconium diseases, caused for example by *Cycloconium oleaginum*;
- Diaporthe diseases, caused for example by *Diaporthe citri*;
- Elsinoe diseases, caused for example by *Elsinoe fawcettii*;
- Gloeosporium diseases, caused for example by *Gloeosporium laeticolor*;
- Glomerella diseases, caused for example by *Glomerella cingulata*;
- Guignardia diseases, caused for example by *Guignardia bidwelli*;
- Leptosphaeria diseases, caused for example by *Leptosphaeria maculans*; *Leptosphaeria nodorum*;
- Magnaporthe diseases, caused for example by *Magnaporthe grisea*;
- Mycosphaerella diseases, caused for example by *Mycosphaerella graminicola*; *Mycosphaerella arachidicola*; *Mycosphaerella fijiensis*;
- Phaeosphaeria diseases, caused for example by *Phaeosphaeria nodorum*;
- Pyrenophora diseases, caused for example by *Pyrenophora teres*;
- Ramularia diseases, caused for example by *Ramularia collo-cygni*;
- Rhynchosporium diseases, caused for example by *Rhynchosporium secalis*;
- Septoria diseases, caused for example by *Septoria api* or *Septoria lycopersici*;
- Typhula diseases, caused for example by *Typhula incarnata*;
- Venturia diseases, caused for example by *Venturia inaequalis*;

Root and stem diseases such as:

- Corticium diseases, caused for example by *Corticium graminearum*;
- Fusarium diseases, caused for example by *Fusarium oxysporum*;
- Gaemannomyces diseases, caused for example by *Gaeumannomyces graminis*;
- Rhizoctonia diseases, caused for example by *Rhizoctonia solani*;
Tapesia diseases, caused for example by *Tapesia acuformis*;
Thielaviopsis diseases, caused for example by *Thielaviopsis basicola*;

Ear and panicle diseases such as:
Alternaria diseases, caused for example by *Alternaria* *spp.*;
Aspergillus diseases, caused for example by *Aspergillus flavus*;
Cladosporium diseases, caused for example by *Cladosporium* *spp.*;
Claviceps diseases, caused for example by *Claviceps purpurea*;
Fusarium diseases, caused for example by *Fusarium culmorum*;
Gibberella diseases, caused for example by *Gibberella zeae*;
Monographella diseases, caused for example by *Monographella nivalis*;

Smut and bunt diseases such as:
Sphacelotheca diseases, caused for example by *Sphacelotheca reiliana*;
Tilletia diseases, caused for example by *Tilletia caries*;
Urocystis diseases, caused for example by *Urocystis occulta*;
Ustilago diseases, caused for example by *Ustilago nuda*;

Fruit rot and mould diseases such as:
Aspergillus diseases, caused for example by *Aspergillus flavus*;
Botrytis diseases, caused for example by *Botrytis cinerea*;
Penicillium diseases, caused for example by *Penicillium expansum*;
Sclerotinia diseases, caused for example by *Sclerotinia sclerotiorum*;
Verticillium diseases, caused for example by *Verticillium alboatrum*;

Seed and soilborne decay, mould, wilt, rot and damping-off diseases:
Fusarium diseases, caused for example by *Fusarium culmorum*;
Phytophthora diseases, caused for example by *Phytophthora cactorum*;
Pythium diseases, caused for example by *Pythium ultimum*;
Rhizoctonia diseases, caused for example by *Rhizoctonia solani*;
Sclerotium diseases, caused for example by *Sclerotium rolfsii*;
Microdochium diseases, caused for example by *Microdochium nivale*;

Canker, broom and dieback diseases such as:
Nectria diseases, caused for example by *Nectria galligena*;

Blight diseases such as:
Monilinia diseases, caused for example by *Monilinia laxa*;

Leaf blister or leaf curl diseases such as:
Taphrina diseases, caused for example by *Taphrina deformans*;

Decline diseases of wooden plants such as:
Esca diseases, caused for example by *Phaemoniella clamydospora*;
Eutypa dyeback, caused for example by *Eutypa lata*;
Dutch elm disease, caused for example by *Ceratocystsc ulmi*;

Diseases of flowers and Seeds such as:
Botrytis diseases, caused for example by Botrytis cinerea;

Diseases of tubers such as:

Rhizoctonia diseases, caused for example by Rhizoctonia solani.

Among the damaging pests or insects that can be controlled at any development stage according to the insecticide method of the invention, mention may be made to:

- the order of the Anoplura (Phthiraptera), for example, Damalinia spp., Haematopinus spp., Linognathus spp., Pediculus spp., Trichodectes spp.;
- the class of the Bivalva, for example, Dreissenia spp.;
- the order of the Collembola, for example, Onychirus armatus;
- the order of the Dermaptera, for example, Forficula auricularia;
- the order of the Diplopoda, for example, Blaniulus guttulatus;

the class of the Gastropoda, for example, Arion spp., Biomphalaria spp., Bulinus spp., Deroceras spp., Galba spp., Lymnaea spp., Oncomelania spp., Succinea spp.;


Protozoa, such as Eimeria;


- the order of the Hymenoptera, for example, Diprion spp., Hoplocampa spp., Lasiocampa spp., Monoecium pharaonis, Vespa spp.;
- the order of the Isopoda, for example, Armadilidium vulgare, Oniscus asellus, Porcellio scaber;
- the order of the Isopoda, for example, Reticulitermes spp., Odontotermes spp.;
- the order of the Orthoptera, for example, Acheta domesticus, Blatta orientalis, Blattella germanica, Gryllotalpa spp., Leucophaea maderae, Locusta spp., Melanoplus spp., Periplaneta americana, Schistocerca gregaria;
- the order of the Siphonaptera, for example, Ceratophyllus spp., Xenopsylla cheopis.
- the order of the Symphyla, for example, Scutigerella immaculate;
the order of the Thysanoptera, for example, Baliothrips biformis, Enneothrips flavens, Frankliniella spp., Heliothrips spp., Hercinothrips femoralis, Kakothrips spp., Rhipiphorothrips cruentatus, Scirtothrips spp., Taeniothrips cardamoni, Thrips spp.;
the order of the Thysanura, for example, Lepisma saccharina;
the beetles, such as Hylotrupes bajulus, Chlorophorus pilosis, Anobium punctatum, Xestobium rufovillosum, Ptilinus pecticornis, Dendrobium pertinax, Ernobius mollis, Priobium carpini, Lyctus brunneus, Lyctus africanus, Lyctus planicollis, Lyctus pubescens, Trogoxylon aequale, Minthes rugicollis, Xyleborus spec. Tryptodendron spec. Apate monachus, Bostrychus capucins, Heterobostrychus brunneus, Sinoxylon spec. Dinoderus minutus;
Hymenoptera, such as Sirex juvencus, Urocerus gigas, Urocerus gigas taignus, Urocerus augur;
termites, such as Kaloterme flavicollis, Cryptotermes brevis, Heterotermes indicola, Reticulitermes flaviipes, Reticulitermes santonensis, Reticulitermes lucifugus, Mastotermes darwiniensis, Zootermopsis nevadensis, Coptotermes formosanus;
Bristletails, such as Lepisma saccharina;
the order of the Acarina, for example, Argas persicus, Argas reflexus, Bryobia spp., Dermanyssus gallinae, Glyciphagus domesticus, Ornithodorus moubat, Rhipicephalus sanguineus, Trombicula alfredugesi, Neutrombicula autumnalis, Dermatophagoides pteronissimus, Dermatophagoides forinae;
the order of the Araneae, for example, Aviculariidae, Araneidae;
the order of the Opiliones, for example, Pseudoscorpiones chelifer, Pseudoscorpiones cheiridium, Opiliones phalangium;
the order of the Isopoda, for example, Oniscus asellus, Porcellio scaber;
the order of the Diplopoda, for example, Blaniulus guttulatus, Polydesmus spp.;
the order of the Chilopoda, for example, Geophilus spp.;
the order of the Zygoptera, for example, Ctenolepisma spp., Lepisma saccharina, Lepismodes inquilineus;
the order of the Blattaria, for example, Blatta orientalies, Blattella germanica, Blattella asahinai, Leucophaea maderae, Panchlora spp., Parcoblatta spp., Periplaneta australasiae, Periplaneta americana, Periplaneta brunnea, Periplaneta fuliginosa, Supella longipalpa;
the order of the Saltatoria, for example, Acheta domesticus;
• the order of the Dermaptera, for example, *Forficula auricularia*;
• the order of the Isoptera, for example, *Kalotermes* spp., *Reticulitermes* spp.;
• the order of the Psocoptera, for example, *Lepinus* spp., *Liposcelis* spp.;
• the order of the Coleoptera, for example, *Anthrenus* spp., *Attagenus* spp., *Dermestes* spp.; *Latheticus oryzae*, *Necrobia* spp., *Pinus* spp., *Rhizopertha dominica*, *Sitophilus granarius*, *Sitophilus oryzae*, *Sitophilus zeamais*, *Stegobium paniceum*.
• the order of the Diptera, for example, *Aedes aegypti*, *Aedes albopictus*, *Aedes taeniorhynchus*, *Anopheles* spp., *Calliphora erythrocephala*, *Chrysozona pluvialis*, *Culex quinquefasciatus*, *Culex pipiens*, *Culex tarsalis*, *Drosophila* spp., *Fannia canicularis*, *Musca domestica*, *Phlebotomus* spp., *Sarcophaga carnaria*, *Simulium* spp., *Stomoxys calcitrans*, *Tipula paludosa*;
• the order of the Lepidoptera, for example, *Achroia grisella*, *Galleria mellonella*, *Plodia interpunctella*, *Tinea cloacella*, *Tinea pellionella*, *Tineola bisselliella*;
• the order of the Siphonaptera, for example, *Ctenocephalides canis*, *Ctenocephalides felis*, *Pulex irritans*, *Tunga penetrans*, *Xenopsylla cheopis*.
• the order of the Hymenoptera, for example, *Camponotus herculeanus*, *Lasius fuliginosus*, *Lasius niger*, *Lasius umbratus*, *Monomorium pharaonis*, *Paravespula* spp., *Tetramorium caespitum*;
• the order of the Anoplura, for example, *Pediculus humanus capitis*, *Pediculus humanus corporis*, *Pemphigus* spp., *Phylocoeca vastatrix*, *Pthirus pubis*;
• the order of the Heteroptera, for example, *Cimex hemipterus*, *Cimex lectularius*, *Rhodinus prolixus*, *Triatoma infestans*.

The fungicide or insecticide composition according to the invention may also be used against fungal diseases or damaging insects liable to grow or attack on or inside timber. The term "timber" means all types of species of wood, and all types of working of this wood intended for construction, for example solid wood, high-density wood, laminated wood, and plywood. The method for treating timber according to the invention mainly consists in contacting one or more compounds according to the invention, or a composition according to the invention; this includes for example direct application, spraying, dipping, injection or any other suitable means.

The dose of active compound usually applied in the method of treatment according to the invention is generally and advantageously from 10 to 800 g/ha, preferably from 50 to 300 g/ha for applications in foliar treatment. The dose of active substance applied is generally and advantageously from 2 to 200 g per 100 kg of seed, preferably from 3 to 150 g per 100 kg of seed in the case of seed treatment.
It is clearly understood that the doses indicated herein are given as illustrative examples of the
method according to the invention. A person skilled in the art will know how to adapt the
application doses, notably according to the nature of the plant or crop to be treated.

The fungicide or insecticide composition according to the invention may also be used in the
treatment of genetically modified organisms with the compounds according to the invention or
the agrochemical compositions according to the invention. Genetically modified plants are
plants into genome of which a heterologous gene encoding a protein of interest has been stably
integrated. The expression "heterologous gene encoding a protein of interest" essentially means
genomes which give the transformed plant new agronomic properties, or genes for improving the
agronomic quality of the modified plant.

The compounds or mixtures according to the invention may also be used for the preparation of
composition useful to curatively or preventively treat human or animal fungal diseases such as,
for example, mycoses, dermatoses, trichophytan diseases and candidiases or diseases caused
by Aspergillus spp., for example Aspergillus fumigatus.

The various aspects of the invention will now be illustrated with reference to the following tables
of compounds examples. The following tables illustrate in a non-limiting manner examples of
compounds according to the invention.

In the following examples, M+1 (or M-1) means the molecular ion peak, plus or minus 1 a.m.u.
(atomic mass unit) respectively, as observed in mass spectroscopy and M (Apcl+) means the
molecular ion peak as it was found via positive atmospheric pressure chemical ionisation in
mass spectroscopy.

In the following examples, the logP values were determined in accordance with EEC Directive
79/831 Annex V.A8 by HPLC (High Performance Liquid Chromatography) on a reversed-phase
column (C 18), using the method described below:

- Temperature: 40°C ; Mobile phases: 0.1% aqueous formic acid and acetonitrile; linear gradient
  from 10% acetonitrile to 90% acetonitrile.
- Calibration was carried out using unbranched alkan-2-ones (comprising 3 to 16 carbon atoms)
  with known logP values (determination of the logP values by the retention times using linear
  interpolation between two successive alkanones).

The lambda max values were determined in the maxima of the chromatographic signals using
the UV spectra from 190nm to 400nm.
Table 1. Compounds according to formula (I):

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The following examples illustrate in a non-limiting manner the preparation and efficacy of the compounds of formula (I) according to the invention.

Preparation example 1 - Process (a) - compound (III) to compound (la): N’-(2,5-dimethyl-4-[(3-(trifluoromethyl)benzyl)oxy]phenyl)-N-ethyl-N-methylimidoformamide - compound 9

To a solution of 206 mg (1.00 mmol) of N-ethyl-N’-(4-hydroxy-2,5-dimethylphenyl)-N-methylimidoformamide in 5 ml N,N-dimethylformamide 26.4 mg (1.10 mmol) of sodium hydride were added at 0°C. After stirring at 0°C for 30 min 262 mg (1.10 mmol) 1-(bromomethyl)-3-(trifluoromethyl)benzene were added and the reaction mixture was allowed to warm to room temperature. After stirring for 16h the reaction mixture was concentrated in vacuo and and 10 ml of water and 10 ml of ethyl acetate were added. The organic layer was separated, dried over a cartridge filled with sodium sulfate and concentrated in vacuo. Without further purification 328 mg (0.90 mmol; 90%) of N’-(2,5-dimethyl-4-[(3-(trifluoromethyl)benzyl)oxy]phenyl)-N-ethyl-N-methylimidoformamide were obtained. log P (pH 2.3) = 2.24

Preparation example 2 - Process (b) - compound (VII) to compound (X) : N-ethyl-N’-2-(2-fluorophenyl)vinyl-1-2,5-dimethylphenyl-N-methylimidoformamide - intermediate (VII-1)
The reaction is carried out using inert conditions (argon or nitrogen atmosphere, dry solvents). A suspension of 474 mg (1.50 mmol) of N-ethyl-N'-(4-iodo-2,5-dimethylphenyl)-N-methylimidooformamide, 201 mg (1.65 mmol) of 1-fluoro-2-vinylbenzene, 321 mg (1.65 mmol) dicyclohexylmethylamine, 43 mg (0.075 mmol) of tri-tert-butylphosphine in 10 ml of dioxane was stirred for 16 hrs at 100°C. After filtration over a cartridge filled with sodium sulfate the mixture is concentrated in vacuo. Without further purification 400 mg (1.29 mmol; 86%) of N-ethyl-N'-(4-[(Z)-2-(2-fluorophenyl)vinyl]-2,5-dimethylphenyl]-N-methylimidooformamide were obtained as a mixture of (E)- and (Z)- stereoisomers.; log P (pH 2.3) = 2.11.

Preparation example 3 - Process (c) - compound X to compound (ib): N-ethyl-N'-(4-[2-(2-fluorophenyl)ethyl]-2,5-dimethylphenyl]-N-methylimidooformamide - compound 44

A suspension of 275 mg (0.88 mmol) of N-ethyl-N'-(2-fluorophenyl)[vinyl]-2,5-dimethylphenyl]-N-methylimidooformamide and 94 mg (0.089 mmol) of palladium on charcoal (10%) in 10 ml of ethanol is stirred under an hydrogen atmosphere (atmospheric pressure) at room temperature for 24 hours. After filtration over a cartridge filled with sodium sulfate 228 mg (0.73 mmol; 83%) of N-ethyl-N'-(4-[2-(2-fluorophenyl)ethyl]-2,5-dimethylphenyl]-N-methylimidooformamide were obtained without purification.; log P (pH 2.3) = 2.23.

Preparation example 4 - Process (d3) - compound (V) to compound (VI): N'-(4-iodo-2,5-dimethylphenyl)-N-ethyl-N-methylimidooformamide - intermediate (V-D)

To a mixture of 12.3 g (50 mmol) of 4-iodo-2,5-dimethylaniline and 83 ml (500 mmol) of triethoxymethane 0.48 g (2.50 mmol) of p-toluene sulfonic acid were added. The reaction
mixture was refluxed for 16 hrs and concentrated in vacuo. The crude product was dissolved in 100 ml of dichloromethane and 5.91 g (100 mmol) N-methylethanamine were added. The reaction mixture was stirred for 16 hrs at 40°C. The reaction mixture was concentrated in vacuo. Column chromatographic (cyclohexane/ethyl acetate 3:1) yielded 13.4 g (42.3 mmol) 85 % of N’-(4-iodo-2,5-dimethylphenyl)-N-ethyl-N-methylimidoformamide; log P (pH 2.3) = 1.21.


Solvent: 50 parts by weight of n,n-dimethylacetamide

Emulsifier: 1 part by weight of alkylaryl polyglycol ether

To produce a suitable preparation of active compound, 1 part by weight of active compound is mixed with the stated amounts of solvent and emulsifier, and the concentrate is diluted with water to the desired concentration.

To test for preventive activity, young plants are inoculated with a spore suspension of Puccinia recondita in a 0.1% strength aqueous agar solution. After the spray coating has dried on, the plants are sprayed with the preparation of active compound at the stated rate of application. The plants remain for 24 hours in an incubation cabinet at 20°C and a relative atmospheric humidity of 100%.

The plants are placed in a greenhouse at a temperature of approximately 20°C and a relative atmospheric humidity of approximately 80% to promote the development of rust pustules.

The test is evaluated 10 days after the inoculation. 0% means an efficacy which corresponds to that of the control, while an efficacy of 100% means that no disease is observed.

In this test the following compounds according to the invention showed an efficacy of 70% or even higher at a concentration of 1000 ppm of active ingredient: 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 61, 62, 64, 65, 66, 70.

Efficacy example B: in vivo preventive test on Erysiphe graminis (Powdery mildew on Barley)

Solvent: 50 parts by weight of n,n-dimethylacetamide

Emulsifier: 1 part by weight of alkylaryl polyglycol ether

To produce a suitable preparation of active compound, 1 part by weight of active compound or active compound combination is mixed with the stated amounts of solvent and emulsifier, and the concentrate is diluted with water to the desired concentration.
To test for preventive activity, young plants are sprayed with the preparation of active compound or active compound combination at the stated rate of application.

After the spray coating has dried on, the plants are dusted with spores of *Erysiphe graminis f.sp. hordei*.

The plants are placed in a greenhouse at a temperature of approximately 20°C and a relative atmospheric humidity of approximately 80% to promote the development of mildew pustules.

The test is evaluated 7 days after the inoculation. 0% means an efficacy which corresponds to that of the control, while an efficacy of 100% means that no disease is observed.

In this test the following compounds according to the invention showed an efficacy of 70% or even higher at a concentration of 1000 ppm of active ingredient: 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 61, 62, 64, 65, 66, 70.

**Efficacy example C: in vivo protective test on Alternaria solani (Leaf spot of tomato)**

Solvent: 49 parts by weight of N, N-dimethylformamide

Emulsifier: 1 part by weight of alkylarylpolyglycolether

To produce a suitable preparation of active compound, 1 part by weight of active compound is mixed with the stated amounts of solvent and emulsifier, and the concentrate is diluted with water to the desired concentration.

To test for protective activity, young plants are sprayed with the preparation of active compound at the stated rate of application. After the spray coating has dried on, the plants are inoculated with an aqueous spore suspension of *Alternaria solani*. The plants remain for one day in an incubation cabinet at approximately 20°C and a relative atmospheric humidity of 100%. Then the plants are placed in an incubation cabinet at approximately 20°C and a relative atmospheric humidity of 96%.

The test is evaluated 7 days after the inoculation. 0% means an efficacy which corresponds to that of the control while an efficacy of 100% means that no disease is observed.

In this test, invention related compounds of the following formula revealed an efficacy of 70% or higher at a concentration of 500 ppm of active ingredient: 7, 8, 10, 11, 12, 13, 14, 18, 23, 31, 32, 33, 34, 35, 64, 88, 92, 100, 103, 105, 107, 109.

**Efficacy example D: in vivo protective test on Podosphaera leucotricha (apples).**
Solvent: 24.5 parts by weight of acetone
24.5 parts by weight of dimethylacetamide
Emulsifier: 1 part by weight of alkylaryl polyglycol ether

To produce a suitable preparation of active compound, 1 part by weight of active compound is mixed with the stated amounts of solvent and emulsifier, and the concentrate is diluted with water to the desired concentration.

To test for protective activity, young plants are sprayed with the preparation of active compound at the stated rate of application. After the spray coating has dried on, the plants are inoculated with an aqueous spore suspension of the causal agent of apple mildew (Podosphaera leucotricha). The plants are then placed in a greenhouse at approximately 23°C and a relative atmospheric humidity of approximately 70%.

The test is evaluated 10 days after the inoculation. 0% means an efficacy which corresponds to that of the control, while an efficacy of 100% means that no disease is observed. In this test the compounds according to the invention of the following structures showed efficacy of 70% or even higher at a concentration of 100 ppm of active ingredient: 3, 8, 14, 16, 17, 18, 23, 32, 25, 41, 43, 44.

Efficacy example E: in vivo protective test on Sphaerotheca fuliginea (cucumbers)
Solvent: 24.5 parts by weight of acetone
24.5 parts by weight of dimethylacetamide
Emulsifier: 1 part by weight of alkylaryl polyglycol ether

To produce a suitable preparation of active compound, 1 part by weight of active compound is mixed with the stated amounts of solvent and emulsifier, and the concentrate is diluted with water to the desired concentration.

To test for protect activity, young plants are sprayed with the preparation of active compound at the stated rate of application. After the spray coating has dried on, the plants are inoculated with an aqueous spore suspension of Sphaerotheca fuliginea. The plants are then placed in a greenhouse at approximately 23°C and a relative atmospheric humidity of approximately 70%.

The test is evaluated 7 days after the inoculation. 0% means an efficacy which corresponds to that of the control, while an efficacy of 100% means that no disease is observed. In this test the compounds according to the invention of the following structures showed efficacy of 70% or even higher at a concentration of 100 ppm of active ingredient: 2, 3, 8, 12, 14, 16, 17, 18, 20, 23, 32, 33, 34, 35, 37, 41, 42, 43, 44, 64, 73.
Efficacy example F: *in vivo* protective test on *Botrytis cinerea* (beans)

Solvent: 24.5 parts by weight of acetone
         24.5 parts by weight of dimethylacetamide

Emulsifier: 1 part by weight of alkylaryl polyglycol ether

To produce a suitable preparation of active compound, 1 part by weight of active compound is mixed with the stated amounts of solvent and emulsifier, and the concentrate is diluted with water to the desired concentration.

To test for protective activity, young plants are sprayed with the preparation of active compound. After the spray coating has dried on, 2 small pieces of agar covered with growth of *Botrytis cinerea* are placed on each leaf. The inoculated plants are placed in a darkened chamber at 20°C and a relative atmospheric humidity of 100%.

2 days after the inoculation, the size of the lesions on the leaves is evaluated. 0% means an efficacy which corresponds to that of the control, while an efficacy of 100% means that no disease is observed.

In this test the compounds according to the invention of the following structures showed efficacy of 70% or even higher at a concentration of 500ppm of active ingredient: 12, 49, 54, 72, 73, 82, 86, 87, 88, 89, 90, 92, 93, 95, 96, 98, 99, 101, 103, 105, 107, 108, 111, 113, 119, 123, 124, 125, 126, 127, 131.

Efficacy example G: *in vivo* protective test on *Uromyces appendiculatus* (beans)

Solvent: 24.5 parts by weight of acetone
         24.5 parts by weight of dimethylacetamide

Emulsifier: 1 part by weight of alkylaryl polyglycol ether

To produce a suitable preparation of active compound, 1 part by weight of active compound is mixed with the stated amounts of solvent and emulsifier, and the concentrate is diluted with water to the desired concentration.

To test for protective activity, young plants are sprayed with the preparation of active compound at the stated rate of application. After the spray coating has dried on, the plants are inoculated with an aqueous spore suspension of the causal agent of bean rust (*Uromyces appendiculatus*) and then remain for 1 day in an incubation cabinet at approximately 20°C and a relative atmospheric humidity of 100%.
The plants are then placed in a greenhouse at approximately 210°C and a relative atmospheric humidity of approximately 90%.

The test is evaluated 10 days after the inoculation. 0% means an efficacy which corresponds to that of the control, while an efficacy of 100% means that no disease is observed.

In this test the compounds according to the invention of the following structures showed efficacy of 70% or even higher at a concentration of 10ppm of active ingredient: 129, 132, 133.

**Efficacy example H: in vivo protective test on Myzus persicae (MYZUPE)**

<table>
<thead>
<tr>
<th>Solvent:</th>
<th>78 parts by weight acetone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dye:</td>
<td>0.5 parts by weight alkylarylpolyglcoether</td>
</tr>
</tbody>
</table>

To produce a suitable preparation of active compound, 1 part by weight of active compound is mixed with the stated amount of solvent and emulsifier, and the concentrate is diluted with emulsifier-containing water to the desired concentration.

Chinese cabbage (*Brassica pekinensis*) leaf-disks infected with all instars of the green peach aphid (*Myzus persicae*), are sprayed with a preparation of the active ingredient at the desired concentration.

After the specified period of time, mortality in % is determined. 100% means that all aphids have been killed; 0% means that none of the aphids have been killed.

In this test for example, the following compounds from the preparation examples showed good activity: 3, 13, 16, 18, 19, 20, 25, 29, 30, 31, 35, 49, 52, 56, 61, 64, 65, 68, 69, 72, 73.

**Efficacy example I: in vivo protective test on Aedes Aegypti (AEDSAE U)**

<table>
<thead>
<tr>
<th>Solvent:</th>
<th>1 % N-methylpyrrolidone (NMP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dye:</td>
<td>brillantsulfoflavin for staining water</td>
</tr>
</tbody>
</table>

To produce a suitable preparation of the active compound, the active compound is mixed with the stated amount of solvent, and the concentrate is diluted with staining water to the desired concentration.

*Aedes aegypti* larvae are pipetted with a preparation of active ingredient of the desired concentration.
After the specified period of time, mortality in % is determined. 100% means that all larvae have been killed, a 0% means that none of the larvae have been killed.

In this test, the following compound from the preparation example show good activity: 1, 3, 4, 6, 7, 9, 13, 14, 18, 29.

**Efficacy example J:** *in vivo protective test on* *Heliothis viresens* *(HELIVI)*

**Solvent:**
78 parts by weight acetone
1.5 parts by weight dimethylformamide

**Wetting agent:**
0.5 parts by weight alkylarylpolyglcolether

To produce a suitable preparation of active compound, 1 part by weight of active compound is mixed with the stated amount of solvent and emulsifier, and the concentrate is diluted with emulsifier-containing water to the desired concentration.

Soybean *(Glycine max.)* leaf sections are sprayed with a preparation of the active ingredient of the desired concentration. Once dry, the leaf sections are infested with eggs of cotton bollworm *(Heliotis virescens)*.

After the specified period of time, mortality in % is determined. 100% means that all eggs have been killed and 0% means that none of the eggs have been killed.

In this test for example, the following compounds from the preparation examples showed good activity: 6, 7.
1. A phenyl-amidine derivative of formula (I):

\[ \text{(Ia): } X = O \quad \text{(Ib): } X = \text{CH}_2 \]

wherein

- \( X = \text{O or CH}_2 \);
- \( R^1 \) represents \( H, \) a substituted or non-substituted \( \text{Ci-C}_4\text{-alkyl}, \) a substituted or non-substituted \( \text{C}_2\text-F\text{-alkenyl}, \) a substituted or non-substituted \( \text{C}_2\text-F\text{-alkynyl}, \) \( \text{SH} \) or a substituted or non-substituted \( \text{S-Ci-C}_4\text{-alkyl} \);
- \( R^2 \) represents a substituted or non-substituted \( \text{d-C}_6\text{-alkyl} \);
- \( R^3 \) represents a substituted or non-substituted \( \text{C}_2\text-C_6\text{-alkenyl}, \) substituted or non-substituted \( \text{C}_2\text-C_6\text{-cycloalkyl}, \) substituted or non-substituted \( \text{C}_2\text-C_6\text{-alkenyl}, \) substituted or non-substituted \( \text{C}_2\text-C_6\text{-alkynyl}, \) Halogeno-\( \text{d-C}_6\text{-alkyl} \); or
- \( R^1, R^2, R^3 \) or \( R^2 \) and \( R^3 \) can form together a substituted or non-substituted 5 to 7-membered heterocycle;
- \( R^4 \) represents a substituted or non-substituted \( \text{d-C}_6\text{-alkyl}, \) a halogen atom, Halogeno-\( \text{C}_i\text-C_i\text{-alkyl}, \) substituted or non-substituted \( \text{O-Ci-C}_i\text{-alkyl} \) or cyano;
- \( R^5 \) represents \( H, \) a substituted or non-substituted \( \text{d-C}_6\text{-alkyl}, \) a halogen atom, Halogeno-\( \text{d-C}_6\text{-alkyl}, \) substituted or non-substituted \( \text{O-d-C}_6\text{-alkyl} \) or cyano;
- \( R^6 \) represents \( H, \) a substituted or non-substituted \( \text{d-C}_6\text{-alkyl}, \) a halogen atom or Halogeno-\( \text{d-C}_6\text{-alkyl} \);
- \( m \) represents 0, 1, 2, 3, 4 or 5;
- \( R^7 \), which may be the same or different, represents \( H, \) a halogen atom, nitro, cyano, trialkylsilyl, \( \text{d-C}_6\text{-alkyl}, \) substituted or non-substituted \( \text{d-C}_4\text{-alkyl-phenyl}, \) substituted or non-substituted phenyl, \( \text{d-C}_4\text{-alkoxy}, \) \( \text{d-C}_4\text{-alkoxy} \) \( \text{Ci-C}_4\text{-alkyl}, \) \( \text{d-C}_6\text{-alkylthio}, \) \( \text{CrC}_6\text{-halogenaalkyl}, \) \( \text{d-C}_6\text{-halogenalkoxy} \) or \( \text{d-C}_6\text{-halogenoalkylthio}, \) substituted or non-substituted \( \text{Ci-C}_4\text{-alkoxy-phenyl like benzylxy}, \) substituted or non-substituted phenoxy,
substituted, non substituted alkylamino-C-6-NR8R9, substituted or non substituted 
NR8R9, C1-C6-alkyl-Si(O)10R10, =Si(O)10R10, C1-C6-alkyl-SO2NR8R9, -SO2NR8R9R10, C1-C6-
alkyl-C(O)R11, -CR10=NR-O-R12.

- two substituents R7 can form a carbocyclic or heterocyclic ring, which may comprise 
one or more heteroatoms selected in the list consisting of O, N, S;
- n represents 0, 1 or 2;
- R8 and R9, which may the same or different, represent H, substituted or non-substituted 
C1-C6-alkyl;
- R8 and R9 can form a heterocyclic ring, which may comprise one or more heteroatoms 
selected in the list consisting of O, N, S;
- R10 represents H, substituted or non-substituted, linear or branched C1-C6-alkyl, C1-C6-
alkenyl, C1-C6-alkynyl;
- R11 represents H, substituted or non-substituted, linear or branched dC6-alkyl, C1-C6-
alkoxy, NR8R9;
- R12 represents H, substituted or non-substituted, linear or branched dC6-alkyl, C1-C4-
alkyl-phenyl, C1-C6-alkoxy-C1-C4-alkyl, substituted or non-substituted C1-C4-alkyl-
phenyl, substituted or non-substituted phenyl;
- R10 and R12 can form a heterocyclic ring, which may comprise one or more heteroatoms 
selected in the list consisting of O, N, S;
- as well as salts, N-oxides, metallic complexes, metalloidic complexes and optically active or 
geometric isomers thereof.

2. A compound of formula (I) according to claim 1 wherein
- R1 represents H, C-rC12-alkyl or SH; or
- R2 represents methyl; or
- R3 represents C3-C12-alkyl, C3-C12-alkenyl, C1-C6-cycloalkyl; or
- R2 and R3 can form together a substituted or non substituted 5- to 7-membered 
heterocycle; or
- R4 represents C1-C12-alkyl, a halogen atom or trifluoromethyl; or
- R5 represents H, C1-C12-alkyl, a halogen atom or trifluoromethyl; or
- R6 represents H or a non substituted C1-C6-alkyl; or
- m represents 1, 2, 3 or 4; or
- R7, which may be the same or different, represents H; F, Cl, Br, I; nitro; cyano; C1-C6-
alkyl; C1-C6-alkyl-phenyl which may be non substituted or substituted by halogen, C1-
C6-alkyl or C1-C6-halogenoalkyl; phenyl which may be non substituted or substituted by 
halogen, C1-C6-alkyl or C1-C6-halogenoalkyl; C1-C6-alkoxy; C1-C6-alkoxy-C1-C4-alkyl; 
C1-C6-alkylthio; C1-C6-halogenoalkyl; C1-C6-halogenalkoxy; C1-C6-halogenalkylthio; 
C1-C6-alkoxy; C1-C6-alkoxy-C1-C4-alkyl; C1-C6-alkylthio; benzylxoy which may be non
substituted or substituted by halogen; phenoxy which may be non substituted or substituted by a halogen atom or CF<sub>3</sub>; NR<sup>8</sup>R<sup>9</sup>; Cl-C<sub>4</sub>-alkyl-NR<sup>8</sup>R<sup>9</sup>; S(O)NR<sub>2</sub>Cl; C<sub>4</sub>-C<sub>6</sub>-alkyl-S(O)<sub>n</sub>R<sup>10</sup>; OR<sup>11</sup>; C<sub>1</sub>-C<sub>4</sub>-alkyl-COR<sup>11</sup>; CR<sup>10</sup>=N-O-R<sup>12</sup>; or

- R<sup>8</sup> and R<sup>9</sup>, which may be the same or different, represent H or Cr<sub>6</sub> alkyl; or
- R<sup>8</sup> and R<sup>9</sup> can form a heterocyclic ring comprising further heteroatoms selected in the list consisting of O, S, N; or
- R<sup>10</sup> represents H, methyl or ethyl; or
- R<sup>11</sup> represents H, d-C<sub>4</sub>-alkyl, d-C<sub>4</sub>-alkoxy or NR<sup>8</sup>R<sup>9</sup>; or
- R<sup>12</sup> represents H; d-C<sub>4</sub>-alkyl; d-C<sub>4</sub>-halogenoalkyl; d-C<sub>4</sub>-alkyl-phenyl wherein phenyl may be substituted by F, Cl, Br, i, Ci-C<sub>4</sub>-alkyl, Ci-C<sub>4</sub>-halogenoalkyl or Ci-C<sub>4</sub>-halogenoalkoxy; Ci-C<sub>4</sub>-alkoxy-Ci-C<sub>4</sub>-alkyl; phenoxy; benzylxoy; or
- R<sup>10</sup> and R<sup>12</sup> can form a 5- or 6-membered heterocyclic ring comprising a further heteroatom selected in the list consisting of O, S, N.

3. A compound of formula (I) according to claims 1 or 2 wherein
- R<sup>1</sup> represents Ci-C<sub>2</sub>-alkyl; or
- R<sup>3</sup> represents a non substituted C<sub>2</sub>-C<sub>4</sub>-alkyl, C<sub>3</sub>-C<sub>4</sub>-alkenyl or cyclopropyl; or
- R<sup>2</sup> and R<sup>3</sup> can form together a 6-membered heterocycle; or
- R<sup>4</sup> represents a non substituted Ci-C<sub>2</sub>-alkyl, a fluorine or a chlorine atom; or
- R<sup>5</sup> represents a non substituted Ci-C<sub>2</sub>-alkyl, a fluorine or a chlorine atom; or
- R<sup>6</sup> represents methyl or ethyl; or
- m represents 1, 2 or 3.

4. A compound of formula (I) according to claims 1 to 3 wherein
- R<sup>1</sup> represents methyl; or
- R<sup>3</sup> represents ethyl, n-propyl, i-propyl, propenyl or allyl; or
- R<sup>2</sup> and R<sup>3</sup> can form together a pipiridinyl or a pyrolidinyl; or
- R<sup>4</sup> represents methyl and ethyl; or
- R<sup>5</sup> represents methyl or ethyl.

5. A compound of formula (I) according to claims 1 to 4 wherein R<sup>2</sup> and R<sup>3</sup> form together a 2-alkylated-pyrolidinyl.

6. A compound of formula (I) according to claim 5 wherein R<sup>2</sup> and R<sup>3</sup> form together a 2-methyl-pyrolidinyl.

7. A process for the preparation of a compound of formula (Ia) according to claims 1 to 6 comprising the following steps:
8. A process for the preparation of a compound of formula (Ib) according to claims 1 to 6 comprising the following steps:
9. A method for controlling phytopathogenic fungi of crops, characterized in that an agronomically effective and substantially non-phytotoxic quantity of a compound according to claims 1 to 6 is applied to the soil where plants grow or are capable of growing, to the leaves or the fruit of plants or to the seeds of plants.
10. A method for controlling damaging insects characterised in that a compound of formula (I) according to claims 1 to 6 is applied to the seed, the plant or to the fruit of the plant or to the soil wherein the plant is growing or wherein it is desired to grow.
1. A phenyl-amidine derivative of formula (I):

\[
\begin{align*}
 & R^2 \quad R^3 \\
 & R^1 \quad \text{N} \\
 & R^4 \quad \text{R}^5 \quad \text{R}^6 \\
 & \text{R}^7 \\
 & \text{X} \\
 & \text{aryl}
\end{align*}
\]

wherein

- \( X \) represents O or CH\(_2\);
- \( R^1 \) represents H, a substituted or non substituted C\(_r\) Cl\(_2\)-alkyl, a substituted or non substituted C\(_2\)-C\(_{12}\)-alkenyl, a substituted or non substituted C\(_2\)-Cl\(_2\)-alkynyl, SH or a substituted or non substituted S-C\(_r\) C\(_{12}\)-alkyl;
- \( R^2 \) represents a substituted or non substituted C\(_1\)-C\(_{12}\)-alkyl;
- \( R^3 \) represents a substituted or non substituted C\(_2\)-C\(_{12}\)-alkyl, substituted or non substituted C\(_3\)-C\(_6\)-cycloalkyl, substituted or non substituted C\(_2\)-C\(_{12}\)-alkenyl, substituted or non substituted C\(_2\)-Cl\(_2\)-alkynyl, halogeno-CrCl\(_2\)-alkyl or cyano;
- \( R^1 \) and \( R^3 \),
- \( R^1 \) and \( R^9 \) or
- \( R^2 \) and \( R^3 \) can form together a substituted or non substituted 5 to 7-membered heterocycle;
- \( R^4 \) represents a substituted or non substituted C\(_r\) C\(_{12}\)-alkyl, a halogen atom, halogeno-Ci-Ci\(_2\)-alkyl, substituted or non substituted O-Ci-Ci\(_2\)-alkyl or cyano;
- \( R^5 \) represents H, a substituted or non substituted Ci-Ci\(_{12}\)-alkyl, a halogen atom, halogeno-CrCi\(_2\)-alkyl, substituted or non substituted 0-C\(_1\)-Ci\(_2\)-alkyl or cyano;
- \( R^6 \) represents H, a substituted or non substituted Ci-C\(_6\)-alkyl, a halogen atom or halogeno-CrC\(_6\)-alkyl
• m represents 0, 1, 2, 3, 4 or 5;
• R\textsuperscript{7} which may the same or different, represents H, a halogen atom, nitro, cyano, trialkysilyl, C\textsubscript{r} C\textsubscript{g}-alkyl, substituted or non-substituted C\textsubscript{r} C\textsubscript{g}-alkyl-phenyl, substituted or non-substituted phenyl, d-C\textsubscript{4}-alkoxy, CrC\textsubscript{4}-alkoxy- Ci-C\textsubscript{4}-alkyl, C\textsubscript{r}-C\textsubscript{g}-alkythio, CrC\textsubscript{4}-halogenoalkyl, CrC\textsubscript{4}-halogenalkoxy or CrC\textsubscript{g}-halogenoalkylthio, substituted or non substituted C\textsubscript{r}-C\textsubscript{g}-alkoxy-phenyl like benzylxyloxy, substituted or non substituted phenoxy, substituted, non substituted alkylamino-C\textsubscript{r}, C\textsubscript{g}-NR\textsuperscript{8}R\textsuperscript{9}, substituted or non substituted NR\textsuperscript{8}R\textsuperscript{9}, C\textsubscript{r} C\textsubscript{g}-alkyl-S(O)\textsubscript{n}R\textsuperscript{10}, -S(O)\textsubscript{n}R\textsuperscript{10}, C\textsubscript{r} C\textsubscript{g}-alkyl-SO\textsubscript{2}NR\textsuperscript{8}R\textsuperscript{9}, -SO\textsubscript{2}NR\textsuperscript{8}R\textsuperscript{9}, C\textsubscript{r} C\textsubscript{g}-alkyl-C(O)R\textsuperscript{11}, -CR\textsuperscript{10}=N-O-R\textsuperscript{12};
• two substituents R\textsuperscript{7} can form a carbocyclic or heterocyclic ring, which may comprise one or more heteroatoms selected in the list consisting of O, N, S;
• n represents 0, 1 or 2;
• R\textsuperscript{8} and R\textsuperscript{9} which may the same or different, represent H, substituted or non-substituted C\textsubscript{r} C\textsubscript{g}-alkyl;
• R\textsuperscript{8} and R\textsuperscript{9} can form a heterocyclic ring, which may comprise one or more heteroatoms selected in the list consisting of O, N, S;
• R\textsuperscript{10} represents H, substituted or non-substituted, linear or branched C\textsubscript{r}-C\textsubscript{g}-alkyl, C\textsubscript{r} C\textsubscript{g}-alkenyl, C\textsubscript{r} C\textsubscript{g}-alkynyl;
• R\textsuperscript{11} represents H, substituted or non-substituted, linear or branched C\textsubscript{r}-C\textsubscript{g}-alkyl, C\textsubscript{r} C\textsubscript{g}-alkoxy, NR\textsuperscript{8}R\textsuperscript{9};
• R\textsuperscript{12} represents H, substituted or non-substituted, linear or branched C\textsubscript{r}-C\textsubscript{g}-alkyl, Ci-C\textsubscript{4}-alkyl-phenyl, Ci-C\textsubscript{4}-alkoxy-Ci-C\textsubscript{4}-alkyl, substituted or non-substituted C\textsubscript{r}-C\textsubscript{4}-alkyl-phenyl, substituted or non-substituted phenyl;
• R\textsuperscript{10} and R\textsuperscript{12} can form a heterocyclic ring, which may comprise one or more heteroatoms selected in the list consisting of O, N, S; as well as salts, N-oxides, metallic complexes, metalloidic complexes and optically active or geometric isomers thereof.

2. A compound of formula (I) according to claim 1 wherein
• R\textsuperscript{1} represents H, C\textsubscript{r} C\textsubscript{g}-alkyl or SH; or
• R\textsuperscript{2} represents methyl; or
• R\textsuperscript{3} represents C\textsubscript{r}-Ci\textsubscript{2}-alkyl, C\textsubscript{g}-C\textsubscript{12}-alkenyl; C\textsubscript{3}-C\textsubscript{6}-cycloalkyl; or
• R\textsuperscript{2} and R\textsuperscript{3} can form together a substituted or non substituted 5- to 7-membered heterocycle; or
• R₄ represents C₁₋C₁₂-alkyl, a halogen atom or trifluoromethyl; or
• R₅ represents H, C₁₋C₂-alkyl, a halogen atom or trifluoromethyl or
• R₆ represents H or a non substituted C₁₋C₂-alkyl; or
• m represents 1, 2 or 3; or
• R₇ which may be the same or different, represents H; F, Cl, Br, I; nitro; cyan; CrC₄-alkyl; CrC₄-alkyl-phenyl which may be non substituted or substituted by halogen, C₁₋C₄-alkyl or Ci-C₄-halogenoalkyl; phenyl which may be non substituted or substituted by halogen, C₁₋C₄-alkyl or C₁₋C₄-halogenoalkyl; C₁₋C₄-alkoxy-C₁₋C₄-alkyl; CrC₄-alkylthio; CrC₄-halogenoalkyl-C₁₋C₄-halogenoalkyl; CrC₄-alkyl; CrC₄-halogenoalkylthio; C₁₋C₄-alkoxy-C₁₋C₄-alkyl; CrC₄-alkylthio; benzylxoy which may be non substituted or substituted by halogen; phenoxy which may be non substituted or substituted by a halogen atom or CF₃; NR₆R₈; C₁₋C₄-NR₆R₈; S(O)₉R₁₀; C₁₋C₄-S(O)₉R₁₀; OR₁₁; C₁₋C₄-COR₁₁; -CR₁₀=NR=O-R₁₂; or
• R₈ and R₉ which may be the same or different, represent H or C₁₋C₆ alkyl; or
• R₈ and R₉ can form a heterocyclic ring comprising further heteroatoms selected in the list consisting of O, S, N; or
• R₁₀ represents H, methyl or ethyl; or
• R₁₁ represents H, C₁₋C₄-alkyl, C₁₋C₄-alkoxy or NR₆R₈; or
• R₁₂ represents H; C₁₋C₄-alkyl; CrC₄-halogenoalkyl; CrC₄-alkyl-phenyl wherein phenyl may be substituted by F, Cl, Br, I, d-C₆-alkyl, C₁₋C₄-halogenoalkyl or C₁₋C₄-halogenoalkoxy; C₁₋C₄-alkoxy-C₁₋C₄-alkyl; phenoxy; benzylxoy; or
• R₁₀ and R₁₂ can form a 5- or 6-membered heterocyclic ring comprising a further heteroatoms selected in the list consisting of O, S, N.

3. A compound of formula (I) according to claims 1 or 2 wherein
• R₁ represents C₁₋C₂-alkyl; or
• R₃ represents a non substituted C₂₋C₄-alkyl, C₃₋C₄-alkenyl or cyclopropyl; or
• R₂ and R₃ can form together a 6-membered heterocycle; or
• R₄ represents a non substituted CrC₈-alkyl, a fluorine or a chlorine atom; or
• R₅ represents a non substituted CrC₁₋C₂-alkyl, a fluorine or a chlorine atom; or
• R₆ represents methyl or ethyl; or
• m represents 1, 2 or 3.
4. A compound of formula (I) according to claims 1 to 3 wherein
   - $R^1$ represents methyl; or
   - $R^3$ represents ethyl, n-propyl, i-propyl, propenyl or allyl; or
   - $R^2$ and $R^3$ can form together a pipiridinyl or a pyrolidinyl; or
   - $R^4$ represents methyl and ethyl; or
   - $R^5$ represents methyl or ethyl.

5. A compound of formula (I) according to claims 1 to 4 wherein $R^2$ and $R^3$ form together a 2-alkylated-pyrolidinyl.

6. A compound of formula (I) according to claim 5 wherein $R^2$ and $R^3$ form together a 2-methyl-pyrolidinyl.

7. A process for the preparation of a compound of formula (Ia) according to claims 1 to 6 comprising at least one of the following steps:
8. A process for the preparation of a compound of formula (Ib) according to claims 1 to 6 comprising at least one of the following steps:
9. An aniline derivative of formula (X)
wherein

- $R^4$ represents a substituted or non-substituted $\text{C}_1\text{C}_2$-alkyl, a halogen atom, halogeno-$\text{C}_1\text{C}_2$-alkyl, substituted or non-substituted $\text{O-C}_1\text{C}_2$-alkyl or cyano;
- $R^5$ represents $\text{H}$, a substituted or non-substituted $\text{CrC}_1\text{C}_2$-alkyl, a halogen atom, halogeno-$\text{CrC}_1\text{C}_2$-alkyl, substituted or non-substituted $\text{O-CrC}_1\text{C}_2$-alkyl or cyano; and
- $X$ represents $\text{OH}$, $\text{Cl}$, $\text{Br}$, $\text{I}$, triflate, mesylate, $\text{SOMe}$ or tosylate.

**10.** An aminophenylether derivative of formula (IV)

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• $R^7$ which may the same or different, represents $H$, a halogen atom, nitro, cyano, trialkysilyl, $C_1$-$C_8$-alkyl, substituted or non-substituted $CrC_4$-alkyl-phenyl, substituted or non-substituted phenyl, $CiC_4$-alkoxy, $C_1$-$C_4$-alkoxy-$C_1$-$C_4$-alkyl, $C_1$-$C_8$-alkythio, $C_1$-$C_6$-halogenoalkyl, $CiC_6$-halogenoalkoxy or $CrC_6$-halogenoalkythio, substituted or non-substituted $C_1$-$C_4$-alkoxy-phenyl like benzyl, substituted or non-substituted phenoxy, substituted, non-substituted alkylamino-$CiC_8$-NR$^8$R$^9$, substituted or non-substituted NR$^8$R$^9$, $C_1$-$C_8$-alkyl-$S(O)_nR^{10}$, $-Si(O)_nR^{10}$, $C_1$-$C_8$-alkyl-$SO_2NR^{8}R^9$, $-SO_2NR^{8}R^{10}$, $C_1$-$C_8$-alkyl-C(O)R$^{11}$, $-CR^{10}=N-O-R^{12}$; two substituents $R^7$ can form a carbocyclic or heterocyclic ring, which may comprise one or more heteroatoms selected in the list consisting of $O$, $N$, $S$.

$R^8$ and $R^9$ which may the same or different, represent $H$, substituted or non-substituted $C_1$-$C_8$-alkyl; $R^8$ and $R^9$ can form a heterocyclic ring, which may comprise one or more heteroatoms selected in the list consisting of $O$, $N$, $S$.

$R^{10}$ represents $H$, substituted or non-substituted, linear or branched $C_1$-$C_8$-alkyl, $CrC_8$-alkenyl, $C_1$-$C_8$-alkynyl; $R^{11}$ represents $H$, substituted or non-substituted, linear or branched $C_1$-$C_8$-alkyl, $C_1$-$C_8$-alkoxy, NR$^8$R$^9$; $R^{12}$ represents $H$, substituted or non-substituted, linear or branched $C_1$-$C_8$-alkyl, $C_1$-$C_4$-alkyl-phenyl, $C_1$-$C_4$-alkoxy-$C_1$-$C_4$-alkyl, substituted or non-substituted $CiC_4$-alkyl-phenyl, substituted or non-substituted phenyl; $R^{10}$ and $R^{12}$ can form a heterocyclic ring, which may comprise one or more heteroatoms selected in the list consisting of $O$, $N$, $S$.

11. An aminophenyl derivative of formula (XII)
(XII)

wherein

- $R^4$ represents a substituted or non-substituted $C_i$-$C_{12}$-alkyl, a halogen atom, halogeno-$C_i$-$C_{12}$-alkyl, substituted or non-substituted $O$-$C_i$-$C_{12}$-alkyl or cyano;
- $R^5$ represents $H$, a substituted or non-substituted $C_i$-$C_{12}$-alkyl, a halogen atom, halogeno-$CrC_i$-$C_{12}$-alkyl, substituted or non-substituted $O$-$C_i$-$C_{12}$-alkyl or cyano;
- $R^6$ represents $H$, a substituted or non-substituted $C_i$-$C_{12}$-alkyl, a halogen atom or halogeno-$C_i$-$C_{12}$-alkyl;

- $m$ represents 0, 1, 2, 3, 4 or 5;
- $R^7$ which may the same or different, represents $H$, a halogen atom, nitro, cyano, trialkylsilyl, $Ci$-$C_{6}$-alkyl, substituted or non-substituted $C_i$-$C_{4}$-alkylphenyl, substituted or non-substituted phenyl, $C_i$-$C_{4}$-alkoxy, $C_i$-$C_{4}$-alkoxy- $Ci$-$C_{4}$-alkyl, $C_i$-$C_{6}$-alkylthio, $C_i$-$C_{6}$-halogenaalkyl, $C_i$-$C_{6}$-halogenalkoxy or $CrC_{6}$-halogenaalkythio, substituted or non-substituted $C_i$-$C_{4}$-alkoxy-phenyl like benzyloxy, substituted or non-substituted phenoxy, substituted, non-substituted alkylamino-$C_i$-$C_{6}$-$NR^{8}R^{9}$, substituted or non-substituted $NR^{8}R^{9}$, $C_i$-$C_{6}$-alkyl-$S(O)iR^{10}$, $S(O)iR^{10}$, $C_i$-$C_{6}$-alkyl-$SO_{2}NR^{8}R^{9}$, $SO_{2}NR^{8}R^{9}$,$C_i$-$C_{6}$-alkyl-$C(O)iR^{11}$, -$CR^{10}O-N-O-R^{12}$;
- two substituents $R^7$ can form a carbocyclic or heterocyclic ring, which may comprise one or more heteroatoms selected in the list consisting of $O$, $N$, $S$; and
- $n$ represents 0, 1 or 2;
- $R^8$ and $R^9$ which may the same or different, represent $H$, substituted or non-substituted $C_i$-$C_{6}$-alkyl;
- $R^8$ and $R^9$ can form a heterocyclic ring, which may comprise one or more heteroatoms selected in the list consisting of $O$, $N$, $S$;
- $R^{10}$ represents $H$, substituted or non-substituted, linear or branched $CrC_{6}$-alkyl, $C_i$-$C_{6}$-alkenyl, $C_i$-$C_{6}$-alkinyl;
- $R^{11}$ represents $H$, substituted or non-substituted, linear or branched $CrC_{6}$-alkyl, $CrC_{6}$-alkoxy, $NR^{8}R^{9}$;
- $R^{12}$ represents $H$, substituted or non-substituted, linear or branched $CrC_{6}$-alkyl, $C_i$-$C_{4}$-alkyl-phenyl, $C_i$-$C_{4}$-alkoxy-$C_i$-$C_{4}$-alkyl, substituted or non-substituted $C_i$-$C_{4}$-alkyl-phenyl, substituted or non-substituted phenyl;
- $R^{10}$ and $R^{12}$ can form a heterocyclic ring, which may comprise one or more heteroatoms selected in the list consisting of $O$, $N$, $S$.

12. An aminophenyl derivative of formula (XIV)

**AMENDED SHEET (ARTICLE 19)**
wherein

- $R^4$ represents a substituted or non-substituted $\text{CrC}_{12}$-alkyl, a halogen atom, halogeno-$\text{CrC}_{12}$-alkyl, substituted or non-substituted $\text{O-CrC}_{2}$-alkyl or cyano;

- $R^5$ represents $\text{H}$, a substituted or non-substituted $\text{C}_r\text{C}_{12}$-alkyl, a halogen atom, halogeno-$\text{C}_r\text{C}_{12}$-alkyl, substituted or non-substituted $\text{O-CrC}_{2}$-alkyl or cyano;

- $R^6$ represents $\text{H}$, a substituted or non-substituted $\text{C}_r\text{C}_6$-alkyl, a halogen atom or halogeno-$\text{C}_r\text{C}_6$-alkyl;

- $m$ represents 0, 1, 2, 3, 4 or 5;

- $R^7$ which may the same or different, represents $\text{H}$, a halogen atom, nitro, cyano, trialkylsilyl, $\text{Cl-C}_r\text{C}_6$-alkyl, substituted or non-substituted $\text{CrC}_4$-alkyl-phenyl, substituted or non-substituted phenyl, $\text{CrC}_4$-alkoxy, $\text{C}_1\text{C}_4$-alkoxy- $\text{C}_r\text{C}_4$-alkyl, $\text{Cl-C}_8$-alkylthio, $\text{C}_r\text{C}_6$-halogenoalkyl, $\text{Cl-C}_6$-halogenalkoxy or $\text{C}_1\text{C}_6$-halogenalkylthio, substituted or non substituted $\text{Cr}_r\text{C}_4$-alkoxy-phenyl like benzylsilyl, substituted or non substituted phenoxy, substituted, non substituted alkylamino-$\text{C}_r\text{C}_6$-$\text{NR}^8\text{R}^9$, substituted or non-substituted $\text{NR}^8\text{R}^9$, $\text{C}_r\text{C}_6$-alkyl-$\text{S(O)}_n\text{R}^{10}$, $\text{-S(O)}_n\text{R}^{10}$, $\text{C}_r\text{C}_6$-alkyl-$\text{SO}_2\text{NR}^8\text{R}^9$, $\text{-SO}_2\text{NR}^8\text{R}^{10}$, $\text{C}_r\text{C}_6$-alkyl-$\text{C(O)}\text{R}^{11}$, $\text{-CR}^{10}=\text{N-O-R}^{12}$;

- two substituents $R^7$ can form a carbocyclic or heterocyclic ring, which may comprise one or more heteroatoms selected in the list consisting of $\text{O, N, S}$;

- $n$ represents 0, 1 or 2;

- $R^8$ and $R^9$ which may the same or different, represent $\text{H}$, substituted or non-substituted $\text{C}_r\text{C}_6$-alkyl;

- $R^8$ and $R^9$ can form a heterocyclic ring, which may comprise one or more heteroatoms selected in the list consisting of $\text{O, N, S}$;

- $R^{10}$ represents $\text{H}$, substituted or non-substituted, linear or branched $\text{C}_r\text{C}_6$-alkyl, $\text{C}_1\text{C}_6$-alkenyl, $\text{C}_1\text{C}_6$-alkinyl;
• $R^{11}$ represents H, substituted or non-substituted, linear or branched $C_r C_8$-alkyl, $C_r C_8$-alkoxy, NR$^8$R$^9$;
• $R^{12}$ represents H, substituted or non-substituted, linear or branched $C_r C_8$-alkyl, $C_1^{-}C_4^{-}$-alkyl-phenyl, Ci-C$_4$-alkoxy-Ci-C$_4$-alkyl, substituted or non-substituted Ci-C$_4$-alkyl-phenyl, substituted or non-substituted phenyl;
• $R^{10}$ and $R^{12}$ can form a heterocyclic ring, which may comprise one or more heteroatoms selected in the list consisting of O, N, S.

13. An aminoacetal derivative of formula (VI)

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     R^2
     /   \
    N   R^3
     \   /
      O   O
       ^   ^
       B^1  B^2
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wherein
• $R^1$ represents H, a substituted or non-substituted Ci-C$12$-alkyl, a substituted or non-substituted C$2^{-}$-C$12$-alkenyl, a substituted or non-substituted C$2^{-}$-C$12$-alkynyl, SH or a substituted or non-substituted S-d-C$12$-alkyl;
• $R^2$ represents a substituted or non-substituted $C_r C_1^{-}$-alkyl;
• $R^3$ represents a substituted or non-substituted $C_2^{-}$-C$12$-alkyl, substituted or non-substituted C$3^{-}$-C$6$-cycloalkyl, substituted or non-substituted C$2^{-}$-C$12$-alkenyl, substituted or non-substituted C$2^{-}$-C$12$-alkynyl, halogeno-C$_r$ Ci-C$_4^{-}$-alkyl; or
• $R^1$ and $R^2$; $R^1$ and $R^3$ or $R^2$ and $R^3$ can form together a substituted or non-substituted 5 to 7-membered heterocycle;
• $B^1$ and $B^2$ represent each alkyl or together cycloalkyl.

14. An aniline derivative of formula (XI)

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AMENDED SHEET (ARTICLE 19)
wherein
• $R^1$ represents $H$, a substituted or non-substituted $C_r C_{12}$-alkyl, a substituted or non-substituted $C_2-C_{12}$-alkenyl, a substituted or non-substituted $C_2-C_{12}$-alkynyl, SH or a substituted or non-substituted S-Ci-Ci$_2$-alkyl;
• $R^2$ represents a substituted or non-substituted $C_r C_{12}$-alkyl;
• $R^3$ represents a substituted or non-substituted $C_2-C_{12}$-alkyl, substituted or non-substituted $C_3-C_6$-cycloalkyl, substituted or non-substituted $C_2-C_{12}$-alkenyl, substituted or non-substituted $C_2-C_{12}$-alkynyl, halogeno-$C_i-C_{12}$-alkyl; or
• $R^1$ and $R^2$; $R^1$ and $R^3$ or $R^2$ and $R^3$ can form together a substituted or non-substituted 5 to 7-membered heterocycle;
• $R^4$ represents a substituted or non-substituted $C_r C_{12}$-alkyl, a halogen atom, halogeno-$C_{12}$-alkyl, substituted or non-substituted O-CrC$_{12}$-alkyl or cyano;
• $R^5$ represents $H$, a substituted or non-substituted $C_r C_{12}$-alkyl, a halogen atom, halogeno-$C_r C_{12}$-alkyl, substituted or non-substituted O-CrC$_{12}$-alkyl or cyano;
• $X$ represents OH, Cl, Br, I, triflate, mesylate, SOMe ortosylate.

15. An aniline derivative of formula (XII)

wherein

![Chemical structure diagram](image-url)
• R¹ represents H, a substituted or non substituted C¹-C¹₂-alkyl, a substituted or non substituted C²-C¹₂-alkenyl, a substituted or non substituted C²-C¹₂-alkynyl, SH or a substituted or non substituted S-C, C¹₂-alkyl;
  • R² represents a substituted or non substituted C¹-C¹₂-alkyl;
  • R³ represents a substituted or non substituted C₂-C¹₂-alkyl, substituted or non substituted C₃-C₆-cycloalkyl, substituted or non substituted C₂-C¹₂-alkenyl, substituted or non substituted C₂-C¹₂-alkynyl, halogeno-CrC₁₂-alkyl; or
  • R¹ and R²; R¹ and R³ or R² and R³ can form together a substituted or non substituted 5 to 7-membered heterocycle;
  • R⁴ represents a substituted or non substituted C¹-C₄-alkyl, a halogen atom, halogeno-CrC₂-alkyl, substituted or non substituted O-CrC₂-alkyl or cyano;
  • R⁵ represents H, a substituted or non substituted C₃-CrC₂-alkyl, a halogen atom, halogeno-Cr-C₁₂-alkyl, substituted or non substituted O-CrC₁₂-alkyl or cyano;
  • R⁶ represents H, a substituted or non substituted C₅-C₈-alkyl, a halogen atom or
defined as: m represents 0, 1, 2, 3, 4 or 5;
  • R⁷, which may the same or different, represents H, a halogen atom, nitro, cyano, trialkylsilyl, Cr₅-C₆-alkyl, substituted or non-substituted CrC₄-alkyl-phenyl, substituted or non-substituted phenyl, CrC₄-alkoxy, CrC₄-alkoxy-d-C₄-alkyl, Cr₅-C₆-alkythio, Cr₅-C₆-halogenoalkyl, CrC₆-halogenoalkoxy or CrC₆-halogenoalkythio, substituted or non substituted C₆-C₈-alkoxy-phenyl like benzyloxy, substituted or non substituted phenoxy, substituted, non substituted alkylamino-Cr, C₈-NR⁸R⁹, substituted or non substituted NR⁸R⁹, C₅-C₆-alkyl-S(O)ₙR¹⁰, S(O)ₙR¹⁰, C₅-C₆-alkyl-SO₂NR⁸R⁹, SO₂NR⁸R¹⁰, C₅-C₆-alkyl-C(O)R¹¹, -CR¹₀-N-O-CR¹₂; or
  • two substituents R⁷ can form a carbocyclic or heterocyclic ring, which may comprise
one or more heteroatoms selected in the list consisting of O, N, S;
  • n represents 0, 1 or 2;
  • R⁸ and R⁹ which may the same or different, represents H, substituted or non-substituted C¹-C₆-alkyl;
  • R⁸ and R⁹ can form a heterocyclic ring, which may comprise one or more heteroatoms
selected in the list consisting of O, N, S;
  • R¹⁰ represents H, substituted or non-substituted, linear or branched C₃-C₈-alkyl, C₁-C₈-alkenyl, C₅-C₈-alkyl
  • R¹¹ represents H, substituted or non-substituted, linear or branched C₅-C₈-alkyl, C₁-C₈-alkoxy, NR⁸R⁹;
• $R_{12}^1$ represents $H$, substituted or non-substituted, linear or branched $\text{C}_8^\text{alkyl}$, $\text{C}_4^\text{alkyl-phenyl}$, $\text{C}_4^\text{alkoxy-C}_4^\text{alkyl}$, substituted or non-substituted $\text{C}_4^\text{alkyl-phenyl}$, substituted or non-substituted phenyl;

• $R_{10}^1$ and $R_{12}^1$ can form a heterocyclic ring, which may comprise one or more heteroatoms selected in the list consisting of O, N, S.

16. A method for controlling phytopathogenic fungi of crops, characterized in that an agronomically effective and substantially non-phytotoxic quantity of a compound according to claims 1 to 6 is applied to the soil where plants grow or are capable of growing, to the leaves or the fruit of plants or to the seeds of plants.

17. A method method for controlling damaging insects characterised in that a compound of formula (I) according to claims 1 to 6 is applied to the seed, the plant or to the fruit of the plant or to the soil wherein the plant is growing or wherein it is desired to grow.
### A. CLASSIFICATION OF SUBJECT MATTER
INV. C07C257/12 C07D295/195 A01N37/52 A01N43/40

According to International Patent Classification (IPC) or both national classification and IPC.

### B. FIELDS SEARCHED
Minimum documentation searched (classification system followed by classification symbols)
C07D C07C A01N

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

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data, PAJ, BEILSTEIN Data

### C. DOCUMENTS CONSIDERED TO BE RELEVANT

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**A**: member of the same patent family

Date of the actual completion of the international search: 11 December 2006

Date of mailing of the international search report: 27/12/2006

Name and mailing address of the ISA:
European Patent Office, P B 5818 Patentlaan 2 NL - 2280 HV Rijswijk
Tel (+31-70) 340-2040, Tx 31 851 epc nl
Fax (+31-70) 340-3016

Authorized officer:
Helps, Ian
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