(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
22 November 2018 (22.11.2018)

WIPO | PCT

(10) International Publication Number
WO 2018/211442 A1

(51) International Patent Classification:
C07D 213/75 (2006.01) *C07D 213/83* (2006.01)
A01N 41/02 (2006.01) *C07D 231/14* (2006.01)
A01N 43/40 (2006.01) *C07D 275/06* (2006.01)
A01N 43/56 (2006.01) *C07C 381/10* (2006.01)

(21) International Application Number:
PCT/IB2018/053456

(22) International Filing Date:
17 May 2018 (17.05.2018)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
201711017503 18 May 2017 (18.05.2017) IN

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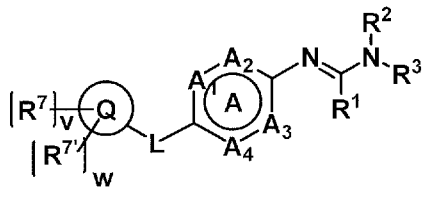
(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:
— *of inventorship (Rule 4.17(iv))*

Published:
— *with international search report (Art. 21(3))*
— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

(54) Title: FORMIMIDAMIDINE COMPOUNDS USEFUL AGAINST PHYTOPATHOGENIC MICROORGANISMS



(I)

(57) Abstract: The present invention relates to 4-substituted amidine derivatives of the general formula (I), wherein A_1-A_4, D, L, Q, R^7, $R^{7'}$ and integer's v and w have the meanings as defined in description. The invention further relates to methods for their preparation and use of said compounds to fight undesired phytopathogenic microorganisms, and agents for said purpose, comprising said amidine derivatives, all according to the invention. This invention further relates to a method for controlling undesired phytopathogenic microorganisms by application of said 4-substituted amidine derivatives of general formula (I) to such undesired microorganisms and/or to their habitat, according to the invention. (I)

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FORMIMIDAMIDINE COMPOUNDS USEFUL AGAINST PHYTOPATHOGENIC MICROORGANISMS

FIELD OF THE INVENTION

The present invention relates to compounds intended to protect crops by fighting undesired phytopathogenic microorganisms. More precisely, the subject of the present invention relates to novel amidine derivatives used to protect crops by fighting undesired phytopathogenic microorganisms.

BACKGROUND OF THE INVENTION

The control of damages to crops caused by phytopathogenic microorganisms is extremely important in achieving high crop efficiency. For instance, plant disease damage to ornamental, vegetable, field, cereal, and fruit crops can cause significant reduction in productivity and thereby result in increased costs to the consumer. Many products are commercially available to control such damages. The need continues for new compounds which are more effective, less costly, less toxic, environmentally safer and/or have different modes of action. Certain phenylamidine derivatives are disclosed in literature as microbiocidally active ingredients in pesticides. For example,

WO2000046184, WO2003093224, WO2005120234, WO2007031507, WO2007031526, WO2007031524, WO2007031523, WO2007031513, WO2007031508, WO2007031512, WO2007061966, WO2007093227, WO2008064780, WO2008110314, WO2008110313, WO2008110315, WO2008110278, WO2008110279, WO2008110280, WO2008110281, WO2008110312, WO2008128639, WO2009053250, WO2009083105, WO2009088103, WO2009156098, WO2009156074, WO2010086118, WO2010115758, WO2011082941, WO2011120912, WO2012019998, WO2012025450, WO2012060401, WO2012090969, WO2013018735, WO2013136275, WO2014037315, WO2014037314, WO2014119617, WO2014157596, WO2015025962, WO2015121231, WO2015121802, WO2016202742, WO2016202688, WO2017005710, WO2017063973, WO2017067839, WO2017067837, WO2017102635, and CN107200712 discloses the phenylamidine derivatives and their use, either alone or as part of composition, as fungicides.

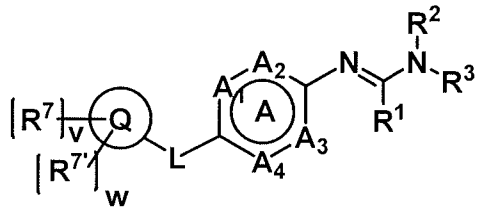
The effectiveness of phenylamidine derivatives described in the prior art is good, but leaves something to be desired in various cases. Therefore, it is always of high interest in agriculture to use novel pesticidal compounds in order to avoid and/or control the development of microorganisms such as fungal or bacterial pathogens or pests being resistant to known active ingredients. It is therefore 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.

We have now found a new family of compounds which possess the above mentioned effects or advantages. A new family of compounds namely, novel amidine derivatives, wherein the ring "A"and "Q"are substituted according to the invention thus allowing an unexpected and significantly higher activity against undesired microorganisms such as fungal or bacterial pathogens or pests.

SUMMARY OF THE INVENTION

The present invention relates to compounds of the general formula (I)



(I)

wherein all symbols are defined in the detail description and claims.

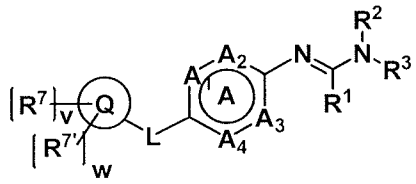
The present invention also relates to agriculturally acceptable salts, structural isomers, stereo-isomers, diastereomers, enantiomers, tautomers, metal complexes, polymorphs, compositions or N-oxides of the compound of formula (I).

The present invention also relates to a composition comprising at least one compound of the present invention and optionally at least one other active compound selected from fungicides, insecticides, nematicides, acaricides, biopesticides, herbicides, plant growth regulators, antibiotics, fertilizers and or mixtures thereof. The present invention further relates to the use of the compound, the combination or the composition of the present invention and method of using the same, particularly in the field of agriculture mainly for protecting plants.

The compounds of the present invention are novel and have enhanced activity against microbials, particularly phytopathogenic fungi. The compounds of the present invention have application in the field of agriculture or may be used as intermediates for synthesizing compounds having wider applications.

DETAILED DESCRIPTION OF THE INVENTION

Accordingly, the present invention relates to compounds of general formula (I),



I

wherein,

R^1 is selected from the group consisting of hydrogen, CN, SR″, OR″, C_1-C_{12}-alkyl, C_2-C_{12}-alkenyl, C_2-C_{12}-alkynyl, C_1-C_{12}-haloalkyl, C_2-C_{12}-haloalkenyl, C_2-C_{12}-haloalkynyl, C_1-C_{12}-alkoxy, C_1-C_{12}-alkylthio, cyclic C_3-C_8-alkyl, cyclic C_4-C_8-alkenyl, cyclic C_4-C_8-alkynyl; wherein one or more carbon atoms in cyclic ring system may be replaced by heteroatoms selected from the group consisting of N, O, S and optionally including 1 to 3 ring members selected from the group consisting of C(=O), C(=S), $S(O)_m$ or $Si(R'_2)$;

R^2 and R^3 are independently selected from the group consisting of hydrogen, CN, $S(O)_nR''$, OR″, (C=O)-R″, C_1-C_{12}-alkyl, C_2-C_{12}-alkenyl, C_2-C_{12}-alkynyl, C_1-C_{12}-haloalkyl, C_2-C_{12}-haloalkenyl, C_2-C_{12}-haloalkynyl, cyclic C_3-C_8-alkyl, cyclic C_4-C_8-alkenyl, cyclic C_4-C_8-alkynyl, C_{5-18}-aryl, C_7-C_{19}-aralkyl; wherein one or more carbon atoms in cyclic ring system may be replaced by heteroatoms selected from the group consisting of N, O, S and optionally including 1 to 3 ring members selected from the group consisting of C(=O), C(=S), $S(O)_m$ or $Si(R'_2)$;

R^1 and R^2, R^2 and R^3 or R^1 and R^3 together with the atoms to which they are attached or together with further atoms selected from the group consisting of C, N, O, S and optionally including 1 to 3 ring members selected from the group consisting of C(=O), C(=S), $S(O)_m$ or $Si(R'_2)$ may form a three to seven membered non aromatic ring, which for its part may be substituted by one or more X, R′, OR′, SR′, $N(R')_2$, $Si(R')_3$, COOR′, CN, or $CON(R')_2$; wherein, each one of R^1, R^2 and R^3 may optionally be substituted by one or more groups selected from the group consisting of X, R′, OR′, SR′, $N(R')_2$, $Si(R')_3$, COOR′, CN, or $CON(R')_2$;

A_1, A_2, A_3 and A_4 represent CR^4 or nitrogen; provided that no more than two of A_1, A_2, A_3 and A_4 are to be nitogen simulteneously.

R^4 is independently selected from the group consisting of hydrogen, X, CN, $N(R'')_2$, SCN, SF_5, $S(O)_nR''$, $Si(R')_3$, OR″, (C=O)-R″, CR′=NR″, C_1-C_{12}-alkyl, C_2-C_{12}-alkenyl, C_2-C_{12}-alkynyl, C_1-C_{12}-haloalkyl, C_2-C_{12}-haloalkenyl, C_2-C_{12}-haloalkynyl, cyclic C_3-C_8-alkyl, cyclic C_4-C_8-alkenyl, cyclic C_4-C_8-alkynyl, C_{5-18}-aryl,

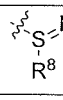
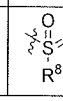
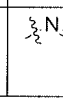
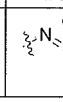
C_7-C_{19}-aralkyl; wherein one or more carbon atoms in cyclic ring system may be replaced by heteroatoms selected from the group consisting of N, O, S and optionally including 1 to 3 ring members selected from the group consisting of C(=O), C(=S), $S(O)_m$ or $Si(R'_2)$; or

two vicinal R^4 together with the atom to which they are attached or together with further atoms selected from the group consisting of C, N, O, S and optionally including 1 to 3 ring members selected from the group consisting of C(=O), C(=S), $S(O)_m$ or $Si(R'_2)$ may form a four to seven membered ring, which for its part may be substituted by one or more X, R', OR', SR', $N(R')_2$, $Si(R')_3$, COOR', CN, or $CON(R')_2$;

L represents O, S, NR", CR^5R^6 or T;

wherein

wherein T represents a radical selected from T1 to T12:

T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12
											

; wherein left side of the fragment T is attached to Q;

wherein  represent attachments of the atom or group;

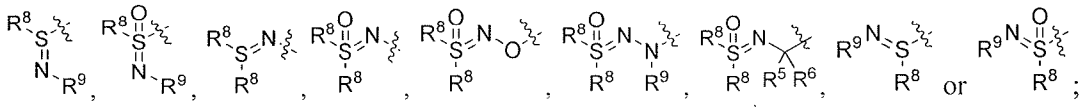
R^5 and R^6 are independently selected from the group consisting of hydrogen, X, CN, NR''_2, SCN, $S(O)_nR''$, $Si(R')_3$, OR', (C=O)-R", CR'=NR", C_1-C_{12}-alkyl, C_2-C_{12}-alkenyl, C_2-C_{12}-alkynyl, C_1-C_{12}-haloalkyl, C_2-C_{12}-haloalkenyl, C_2-C_{12}-haloalkynyl, cyclic C_3-C_8-alkyl, cyclic C_4-C_8-alkenyl, cyclic C_4-C_8-alkynyl, C_{5-18}-aryl, C_7-C_{19}-aralkyl, C_7-C_{19}-alkaryl; wherein one or more carbon atoms in cyclic ring system may be replaced by heteroatoms selected from the group consisting of N, O, S and optionally including 1 to 3 ring members selected from the group consisting of C(=O), C(=S), $S(O)_m$ or $Si(R'_2)$; or

R^5 and R^6 together with the atom to which they are attached or together with further atoms selected from the group consisting of C, N, O, S and optionally including 1 to 3 ring members selected from the group consisting of C(=O), C(=S), $S(O)_m$ or $Si(R'_2)$ may form a three to seven membered ring, which for its part may be substituted by one or more X, R', OR', SR', $N(R')_2$, $Si(R')_3$, COOR', CN, or $CON(R')_2$; or

R^5 and R^6 together represent group selected from =C(R'R'"), =S, =O, =NR'";

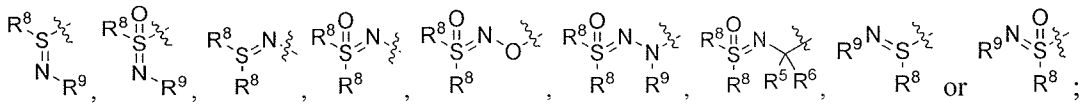
Q represents optionally substituted carbocycle, wherein one or more carbon atoms may be replaced by heteroatoms selected from N, O, S and optionally including 1 to 3 ring members selected from the group consisting of C(=O), C(=S), $S(O)_m$ or $Si(R'_2)$; wherein

R^7 is selected from the group consisting of hydrogen, X, CN, SCN, SF_5, OR″, NO_2, $N(R'')_2$, $Si(R')_3$, (C=O)-R″, $S(O)_nR''$, C_1-C_8-alkyl-$S(O)_nR''$, C_1-C_8-alkyl-(C=O)-R″, CR′=NR″, $S(O)_nC_{5-18}$-aryl, $S(O)_nC_7$-C_{19}-aralkyl, $S(O)_nC_7$-C_{19}-alkaryl, C_1-C_{12}-alkyl, C_2-C_{12}-alkenyl, C_2-C_{12}-alkynyl, C_1-C_{12}-haloalkyl, C_2-C_{12}-haloalkenyl, C_2-C_{12}-haloalkynyl, cyclic C_3-C_8-alkyl, cyclic C_4-C_8-alkenyl, cyclic C_4-C_8-alkynyl, C_7-C_{19}-aralkyl, bicyclic C_5-C_{12}-alkyl, bicyclic C_7-C_{12}-alkenyl,



wherein one or more carbon atoms in cyclic ring system may be replaced by heteroatoms selected from the group consisting of N, O, S and optionally including 1 to 3 ring members selected from the group consisting of C(=O), C(=S), $S(O)_m$ or $Si(R'_2)$;

$R^{7'}$ is independently selected from the group consisting of optionally substituted



wherein

R^8 is independently selected from the group consisting of R″, N(R′R″), $Si(R')_3$, (C=O)-R″, C_1-C_8-alkyl-$S(O)_nR''$, C_1-C_8-alkyl-(C=O)-R″, CR′=NR″, C_1-C_{12}-alkyl, C_2-C_{12}-alkenyl, C_2-C_{12}-alkynyl, C_1-C_{12}-haloalkyl, C_2-C_{12}-haloalkenyl, C_2-C_{12}-haloalkynyl, cyclic C_3-C_8-alkyl, cyclic C_4-C_8-alkenyl, cyclic C_4-C_8-alkynyl, C_7-C_{19}-aralkyl, bicyclic C_5-C_{12}-alkyl, bicyclic C_7-C_{12}-alkenyl, fused or non-fused or bicyclic C_3-C_{18}-carbocycle substituted with one or more R^{10}; wherein one or more carbon atoms in cyclic ring system may be replaced by heteroatoms selected from the group consisting of N, O, S and optionally including 1 to 3 ring members selected from the group consisting of C(=O), C(=S), $S(O)_m$ or $Si(R'_2)$;

R^9 is selected from the group consisting of hydrogen, CN, OR′, N(R′R″), $Si(R')_3$, (C=O)-R‴, $S(O)_nR'''$, C_1-C_8-alkyl-$S(O)_nR'''$, C_1-C_8-alkyl-(C=O)-R‴, CR′=NR″, $S(O)_nC_{5-18}$-aryl, $S(O)_nC_7$-C_{19}-aralkyl, $S(O)_nC_7$-C_{19}-alkaryl, C_1-C_{12}-alkyl, C_2-C_{12}-alkenyl, C_2-C_{12}-alkynyl, C_2-C_{12}-alkynyl-C_1-C_6-alkyl, C_1-C_{12}-haloalkyl,

C_2-C_{12}-haloalkenyl, C_2-C_{12}-haloalkynyl, cyclic C_3-C_8-alkyl, cyclic C_4-C_8-alkenyl, cyclic C_4-C_8-alkynyl, C_7-C_{19}-aralkyl, bicyclic C_5-C_{12}-alkyl, bicyclic C_7-C_{12}-alkenyl, fused or non fused or bicyclic C_3-C_{18}-carbocycle substituted with one or more R^{10}; wherein one or more carbon atoms in cyclic ring system may be replaced by heteroatoms selected from the group consisting of N, O, S and optionally including 1 to 3 ring members selected from the group consisting of C(=O), C(=S), $S(O)_m$ or $Si(R'_2)$; or

R^7 and R^8, R^7 and R^9, R^8 and R^9, R^8 and R^4, two R^8 or two R^7 together with the atom to which they are attached or together with further atoms selected from the group consisting of C, N, O, S and optionally including 1 to 3 ring members selected from the group consisting of C(=O), C(=S), $S(O)_m$ or $Si(R'_2)$ may form a three to seven membered ring, which for its part may be substituted by one or more X, R', OR', SR', $N(R')_2$, $Si(R')_3$, COOR', CN, or $CON(R')_2$;

R^{10} is selected from the group consisting of hydrogen, X, CN, $N(R'')_2$, SCN, $S(O)_nR''$, $Si(R')_3$, OR', (C=O)-R'', CR'=NR'', C_1-C_{12}-alkyl, C_2-C_{12}-alkenyl, C_2-C_{12}-alkynyl, C_1-C_{12}-haloalkyl, C_2-C_{12}-haloalkenyl, C_2-C_{12}-haloalkynyl, cyclic C_3-C_8-alkyl, cyclic C_4-C_8-alkenyl, wherein one or more carbon atoms in cyclic ring system may be replaced by heteroatoms selected from the group consisting of N, O, S and optionally including 1 to 3 ring members selected from the group consisting of C(=O), C(=S), $S(O)_m$ or $Si(R'_2)$;

wherein each one of R^4, R^5, R^6, R^7, R^8, R^9 and R^{10} may optionally be substituted by one or more groups selected from the group consisting of X, R', OR', SR', N(R'R''), $Si(R')_3$, COOR', CN, and CON(R'R'');

wherein

X represents halogen;

R' represents hydrogen, C_1-C_{12}-alkyl or cyclic C_3-C_{10}-alkyl wherein alkyl and cycloalkyl groups may be optionally substituted by one or more X;

R'' represents hydrogen; $N(R')_2$, OR', C_1-C_{12}-alkyl, C_1-C_{12}-haloalkyl, cyclic C_3-C_8-alkyl which may be optionally substituted by one or more groups selected from the group consisting of X, R', OR', SR', $N(R')_2$, $Si(R')_3$, COOR', CN, or $CON(R')_2$, C_6-C_{18}-aryl which may be optionally substituted by one or more X, R', OR', SR', $N(R')_2$, $Si(R')_3$, COOR', CN, or $CON(R')_2$; wherein one or more carbon atoms in cyclic ring system may be replaced by heteroatoms selected from the group consisting of N, O, S and optionally including 1 to 3 ring members selected from the group consisting of C(=O), C(=S), $S(O)_m$ or $Si(R'_2)$;

R''' is selected from the groups consisting of hydrogen, R'', CN, OR', (C=O)-R', COOR', $CON(R')_2$, C_1-

C_{12}-alkyl, C_1-C_{12}-haloalkyl, C_2-C_{12}-alkenyl, C_2-C_{12}-alkynyl, cyclic C_3-C_8-alkyl, cyclic C_4-C_8-alkenyl, cyclic C_4-C_8-alkynyl, C_6-C_{18}-aryl, C_7-C_{19}-aralkyl; wherein one or more carbon atoms in cyclic ring system may be replaced by heteroatoms selected from the group consisting of N, O, S and optionally including 1 to 3 ring members selected from the group consisting of C(=O), C(=S), $S(O)_m$ or $Si(R'_2)$; and each of the above groups may be substituted by one or more groups selected from the group consisting of X, R', OR', SR', $N(R'_2)$, $Si(R'_3)$, COOR', CN, or $CON(R'_2)$;

wherein

n represents integer 0, 1 or 2; v represents an integer 0, 1, 2, 3, 4 or 5; and w represents an integer 0 or 1.

In one of the embodiments, Q in the compounds of general formula (I) can be substituted with atleast one $R^{7'}$ when L represents O, S, NR" CR^5R^6 and Q can be further optionally substituted with R^7.

In one of the embodiments, Q in the compounds of general formula (I) can be substituted with atleast one R^7 when L represents T and Q can be further optionally substituted with $R^{7'}$.

According to an embodiment, R^1 is selected from hydrogen, C_1-C_6-alkyl, C_1-C_6-alkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkyl or C_3-C_8-cycloalkyl.

According to a more preferred embodiment, R^1 is selected from hydrogen, C_1-C_6-alkyl or C_3-C_5-cycloalkyl.

According to an embodiment, R^2 and R^3 are independently selected from CN, C_1-C_6-alkyl, C_2-C_6-alkenyl, C_2-C_6-alkynyl, C_1-C_6-alkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkyl, C_3-C_8-cycloalkyl or non aromatic C_3-C_8-heterocyclyl.

According to one another embodiment R^1 and R^2or R^3 or R^1 and R^3 together with the atoms to which they are attached or together with further atoms selected from the group consisting of C, N, O, S and optionally including 1 to 3 ring members selected from the group consisting of C(=O), C(=S), $S(O)_m$ and $Si(R'_2)$ may form a four to seven membered non aromatic ring, which for its part may be substituted by one or more X, R', OR', SR', (C=O)-R", or CN.

According to one another embodiment the substitutions R^1 and R^2, R^2 and R^3 or R^1 and R^3 together with the atoms to which they are attached form a optionally substituted cyclic ring system selectd from azetidine, pyrrolidine, imidazolidine, oxazolidine, piperidine, morpholine, thiomorpholine, piperazine, 1-methylpiperazine, 1-methylpyrrolidine, 1-methylpiperidine, 3-methyl-1,3-thiazinane.

According to an embodiment, R^4 is selected from hydrogen, X, CN, $S(O)_nR''$, NR'R", (C=O)-R",

CR′=NR″, C_1-C_6-alkyl, C_2-C_6-alkenyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6-haloalkylthio, C_3-C_8-cycloalkyl or C_3-C_8-cycloalkylthio.

According to an embodiment, R^5 and R^6 are independently selected from hydrogen, X, CN, $S(O)_nR''$, NR′R″, (C=O)-R″, CR′=NR″, C_1-C_6-alkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6-haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_3-C_8-cycloalkyl, C_3-C_8-cycloalkoxy or C_3-C_8-cycloalkylthio.

According to an embodiment R^5 and R^6 together with the atom to which they are attached or together with further atoms selected from the group consisting of C, N, O, S may form a three to six membered ring, which for its part may be substituted by one or more X, R′, OR′, SR′, $N(R')_2$, $Si(R')_3$, COOR′, CN, or $CON(R')_2$.

According to an embodiment, R^7 is selected from hydrogen, X, CN, SCN, SF_5, R″, OR″, NO_2, NR''_2, $Si(R')_3$, (C=O)-R″, $S(O)_nR''$, C_1-C_8-alkyl-$S(O)_nR''$, C_1-C_6-alkyl-(C=O)-R″, CR′=NR″, C_2-C_6-alkenyl, C_2-C_6-alkynyl, C_1-C_6-haloalkyl, C_2-C_6-haloalkenyl, C_1-C_6-alkoxy, C_1-C_6-alkylthio, C_1-C_6-holoalkoxy, C_1-C_6-haloalkylthio, C_3-C_8-cycloalkyl, C_4-C_8-cycloalkenyl, C_3-C_8-cycloalkyloxy or C_3-C_8-cycloalkylthio.

In one another embodiment two R^7 together with the atom to which they are attached or together with further atoms selected from the group consisting of C, N, O, S and optionally including 1 to 3 ring members selected from the group consisting of C(=O), C(=S), $S(O)_m$ and $Si(R'_2)$ may form a four to ten membered ring, which for its part may be substituted by one or more X, R′, OR′, SR′, $N(R')_2$, $Si(R')_3$, COOR′, CN or $CON(R')_2$.

In one another embodiment Q is selected from cyclopropyl, cyclobutyl, phenyl, naphthyl, furyl, thienyl, pyrrolyl, isoxazolyl, isothiazolyl, pyrazolyl, oxazolyl, imidazolyl, oxadiazolyl, triazolyl, pyridinyl, pyridazinyl, pyrimidinyl, pyrazinyl, triazinyl, indolyl, benzimidazolyl, indazolyl, benzofuranyl, benzothiophenyl, benzothiazolyl, benzoxazolyl, quinolinyl, isoquinolinyl, quinazolinyl, cinnonyl, indolizinyl, pyrazolo[1,5-a]pyridinyl, imidazo[1,2-a]pyridinyl, pyrrolo[1,2-a]pyrimidinyl, pyrazolo[1,5-a]pyrimidinyl, imidazo[1,2-a]pyrimidinyl, pyrrolo[1,2-a]pyrazinyl, pyrazolo[1,5-a]pyrazinyl, imidazo[1,2-a]pyrazinyl; wherein Q is optionally substituted with one or more R^7.

According to preferred embodiment Q is selected from cyclopropyl, phenyl, naphthyl, thienyl, isothiazolyl, thiazolyl, thiadiazolyl, pyrazolyl, pyridinyl, pyridazinyl, pyrimidinyl, pyrazinyl or quinolinyl; wherein Q is optionally substituted with one or more R^7.

According to an embodiment, R^8 is selected from C_1-C_{12}-alkyl, C_2-C_{12}-alkenyl, C_1-C_{12}-haloalkyl, C_2-C_{12}-haloalkenyl, cyclic C_3-C_8-alkyl, cyclic C_4-C_8-alkenyl, C_7-C_{19}-aralkyl, bicyclic C_5-C_{12}-alkyl, fused or non-

fused or bicyclic C_3-C_{18}-carbocycle substituted with one or more R^{10}; wherein one or more carbon atoms in cyclic ring system may be replaced by heteroatoms selected from the group consisting of N, O, S and optionally including 1 to 3 ring members selected from the group consisting of C(=O), C(=S), $S(O)_m$ or $Si(R'_2)$;

According to an embodiment, R^9 is selected from C_1-C_8-alkyl-$S(O)_nR''$, C_1-C_8-alkyl-(C=O)-R'', CR'=NR'', C_1-C_{12}-alkyl, C_2-C_{12}-alkenyl, C_2-C_{12}-alkynyl-C_1-C_6-alkyl, C_1-C_{12}-haloalkyl, C_2-C_{12}-haloalkenyl, cyclic C_3-C_8-alkyl, cyclic C_4-C_8-alkenyl, cyclic C_4-C_8-alkynyl, C_7-C_{19}-aralkyl, bicyclic C_5-C_{12}-alkyl, C_7-C_{12}-alkenyl, fused or non-fused or bicyclic C_3-C_{18}-carbocycle substituted with one or more R^{10};

An embodiment provides process for the synthesis of compound of formula I.

Another embodiment provides, the use of compound of formula (I) and compositions thereof, for controlling or preventing against phytopathogenic fungi of agricultural crops and or horticultural crops.

A preferred embodiment provides, the use of compounds of formula (I) and compositions thereof, for controlling plant diseases: *Puccinia spp.* (rusts) on various plants, selected from, but not limited to *P. triticina* (brown or leaf rust), *P. striiformis* (stripe or yellow rust), *P. hordei* (dwarf rust), *P. graminis* (stem or black rust) or *P. recondita* (brown or leaf rust) on cereals, selected from wheat, barley or rye and *Phakopsoraceae spp.* on various plants, in particular *Phakopsora pachyrhizi and P. meibomiae* (soybean rust) on soybeans.

A preferred embodiment provides for the use of compound of formula (I) and compositions thereof, more presiely for controlling and/or preventing against phytopathogenic fungi such as *Phakopsora pachyrhizi, Phakopsora meibomiae*, of agricultural crops and or horticultural crops.

A further preferred embodiment provides for the use of compound of formula (I) and compositions thereof, that are particularly suitable for controlling and/or preventing against diseases of the agricultural crops such as cereals, corn, soybean and other leguminous plants; fruits and fruit trees; nuts and nut trees; citrus and citrus trees; any horticultural plants; oleaginous plants; coffee, tea, and other vegetables, and ornamentals.

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 diastereomers and/or the optical isomers can be separated according

to the methods which are known *per se* by a person 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 a person ordinary skilled in the art.

Any of the compounds according to the invention, can also exist in one or more amorphic or isomorphic or polymorphic forms, depending on their preparation, purification storage and various other influencing factors. The invention thus relates all the possible amorphic, isomorphic and polymorphic forms, in all proportions. The amorphic, isomorphic and polymorphic forms can be prepared and/or separated and/or purified according to general methods, which are known per se by a person ordinary skilled in the art.

DEFINITIONS:

The following definitions provided for the terminologies used in the present disclosure are for illustrative purpose only and in no manner limit the scope of the present invention disclosed in the present disclosure.

The transitional phrase "comprises", "comprising", "includes", "including", "has", "having", "contains", "containing", "characterized by" or any other variation thereof, are intended to cover a non-exclusive inclusion, subject to any limitation explicitly indicated. For example, a composition, mixture, process or method that comprises a list of elements is not necessarily limited to only those elements but may include other elements not expressly listed or inherent to such composition, mixture, process or method.

The transitional phrase "consisting of" excludes any element, step or ingredient not specified. If in the claim, such would close the claim to the inclusion of materials other than those recited, except for impurities ordinarily associated therewith. When the phrase "consisting of" appears in a clause of the body of a claim, rather than immediately following the preamble, it limits only the element set forth in that clause; other elements are not excluded from the claim as a whole.

The transitional phrase "consisting essentially of" is used to define a composition or method that includes materials, steps, features, components or elements, in addition to those literally disclosed, provided that these additional materials, steps, features, components or elements do not materially affect the basic and novel characteristic(s) of the claimed invention. The term "consisting essentially of" occupies a middle ground between "comprising" and "consisting of".

Further, unless expressly stated to the contrary, "or" refers to an inclusive "or" and not to an exclusive "or". For example, a condition "A" or "B" is satisfied by any one of the following: A is true (or present)

and B is false (or not present), A is false (or not present) and B is true (or present), and both A and B are true (or present).

Also, the indefinite articles "a" and "an" preceding an element or component of the present invention are intended to be nonrestrictive regarding the number of instances (i.e. occurrences) of the element or component. Therefore "a" or "an" should be read to include one or at least one, and the singular word form of the element or component also includes the plural unless the number is obviously meant to be singular.

As referred to in this disclosure, the term "pesticide" in each case also always comprises the term "crop protection agent".

The term "undesired microorganisms" or "phytopathogenic microorganisms" such as fungal or bacterial pathogens includes namely *Plasmodiophoromycetes, Oomycetes, Chytridiomycetes, Zygomycetes, Ascomycetes, Basidiomycetes* and *Deuteromycetes and Pseudomonadaceae, Rhizobiaceae, Enterobacteriaceae, Corynebacteriaceae* and *Streptomycetaceae* respectively.

The term "agronomic" refers to the production of field crops such as for food, fuels, biofuels, any biomaterials and fiber and includes namely the growth of corn, soybeans and other legumes, rice, cereal (e.g., wheat, oats, barley, rye, rice, maize), leafy vegetables (e.g., lettuce, cabbage, and other cole crops), fruiting vegetables (e.g., tomatoes, pepper, eggplant, crucifers and cucurbits), potatoes, sweet potatoes, grapes, cotton, tree fruits (e.g., pome, stone and citrus), small fruit (berries, cherries), biofuel production crops such as corn, sugar/starch crops, sugar-beet and sweet sorghum, cellulosic crops such as switchgrass, miscanthus, corn stover, poplar, biodiesel crops rapeseed (canola), soybeans, palm oil, mustard, camelina, safflower, sunflower and jatropha and other specialty crops (e.g., canola, sunflower, olives).

The term "nonagronomic" refers to other than field crops, such as horticultural crops (e.g., greenhouse, nursery or ornamental plants not grown in a field), residential, agricultural, commercial and industrial structures, turf (e.g., sod farm, pasture, golf course, lawn, sports field, etc.), wood products, stored product, agro-forestry and vegetation management, public health (i.e. human) and animal health (e.g., domesticated animals such as pets, livestock and poultry, undomesticated animals such as wildlife) applications.

Alkyl, alkenyl, alkynyl, carbocyclyl, heterocyclyl, aryl and heteroaryl groups, as defined herein, are optionally substituted (e.g., "substituted" or "unsubstituted" alkyl, "substituted" or "unsubstituted"

alkenyl, "substituted" or "unsubstituted" alkynyl, "substituted" or "unsubstituted" carbocyclyl, "substituted" or "unsubstituted" heterocyclyl, "substituted" or "unsubstituted" aryl or "substituted" or "unsubstituted" heteroaryl group). In general, the term "substituted", whether preceded by the term "optionally" or not, means that at least one hydrogen present on a group (e.g., a carbon or nitrogen atom etc.) is replaced with a permissible substituent, e.g., a substituent which upon substitution results in a stable compound, e.g., a compound which does not spontaneously undergo transformation such as by rearrangement, cyclization, elimination, or other reaction under normal conditions (temperature, pressure, air etc.). Unless otherwise indicated, a "substituted" group has a substituent at one or more substitutable positions of the group, and when more than one position in any given structure is substituted, the substituent is either the same or different at each position.

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 diastereomers and/or the optical isomers can be separated according to the methods which are known *per se* by a person 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 a person ordinary skilled in the art.

Any of the compounds according to the invention, can also exist in one or more amorphic or isomorphic or polymorphic forms, depending on their preparation, purification storage and various other influencing factors. The invention thus relates all the possible amorphic, isomorphic and polymorphic forms, in all proportions. The amorphic, isomorphic and polymorphic forms can be prepared and/or separated and/or purified according to general methods, which are known per se by a person ordinary skilled in the art.

The term "alkyl", used either alone or in compound words such as "alkylthio" or "haloalkyl" or -N(alkyl) or alkylcarbonylalkyl or alkylsuphonylamino includes straight-chain or branched C_1 to C_{24} alkyl, preferably C_1 to C_{15} alkyl, more preferably C_1 to C_{10} alkyl, most preferably C_1 to C_6 alkyl. Representative examples of alkyl include methyl, ethyl, propyl, 1-methylethyl, butyl, 1-methylpropyl, 2-methylpropyl, 1,1-dimethylethyl, pentyl, 1-methylbutyl, 2-methylbutyl, 3-methylbutyl, 2,2-dimethylpropyl, 1-ethylpropyl, hexyl, 1,1-dimethylpropyl, 1,2-dimethylpropyl, 1-methylpentyl, 2-methylpentyl, 3-methylpentyl, 4-methylpentyl, 1,1-dimethylbutyl, 1,2-dimethylbutyl, 1,3- dimethylbutyl, 2,2-

dimethylbutyl, 2,3-dimethylbutyl, 3,3-dimethylbutyl, 1-ethylbutyl, 2-ethylbutyl,1,1,2-trimethylpropyl, 1,2,2-trimethylpropyl, 1-ethyl-1-methylpropyl and 1-ethyl-2-methylpropyl or the different isomers. If the alkyl is at the end of a composite substituent, as, for example, in alkylcycloalkyl, the part of the composite substituent at the start, for example the cycloalkyl, may be mono- or polysubstituted identically or differently and independently by alkyl. The same also applies to composite substituents in which other radicals, for example alkenyl, alkynyl, hydroxyl, halogen, carbonyl, carbonyloxy and the like, are at the end.

The term "alkenyl", used either alone or in compound words includes straight-chain or branched C_1 to C_{24} alkenes, preferably C_1 to C_{15} alkenes, more preferably C_1 to C_{10} alkenes, most preferably C_1 to C_6 alkenes. Representative examples of alkenes include ethenyl, 1-propenyl, 2-propenyl, 1-methylethenyl, 1-butenyl, 2-butenyl, 3-butenyl, 1-methyl-1-propenyl, 2-methyl-1-propenyl, 1-methyl-2-propenyl, 2-methyl-2-propenyl, 1-pentenyl, 2-pentenyl, 3-pentenyl, 4-pentenyl, 1-methyl-1-butenyl, 2-methyl-1-butenyl, 3-methyl-1-butenyl, 1-methyl-2-butenyl, 2-methyl-2-butenyl, 3-methyl-2-butenyl, 1-methyl-3-butenyl, 2-methyl-3-butenyl, 3-methyl-3-butenyl, 1,1-dimethyl-2-propenyl, 1,2-dimethyl-1-propenyl, 1,2-dimethyl-2-propenyl, 1-ethyl-1-propenyl, 1-ethyl-2-propenyl, 1-hexenyl, 2-hexenyl, 3-hexenyl, 4-hexenyl, 5-hexenyl, 1-methyl-1-pentenyl, 2-methyl-1-pentenyl, 3-methyl-1-pentenyl, 4-methyl-1-pentenyl, 1-methyl-2-pentenyl, 2-methyl-2-pentenyl, 3-methyl-2-pentenyl, 4-methyl-2-pentenyl, 1-methyl-3-pentenyl, 2-methyl-3-pentenyl, 3-methyl-3-pentenyl, 4-methyl-3-pentenyl, 1-methyl-4-pentenyl, 2-methyl-4-pentenyl, 3-methyl-4-pentenyl, 4-methyl-4-pentenyl, 1,1-dimethyl-2-butenyl, 1,1-dimethyl-3-butenyl, 1,2-dimethyl-1-butenyl, 1,2-dimethyl-2-butenyl, 1,2-dimethyl-3-butenyl, 1,3-dimethyl-1-butenyl, 1,3-dimethyl-2-butenyl, 1,3-dimethyl-3-butenyl, 2,2-dimethyl-3-butenyl, 2,3-dimethyl-1-butenyl, 2,3-dimethyl-2-butenyl, 2,3-dimethyl-3-butenyl, 3,3-dimethyl-1butenyl, 3,3-dimethyl-2-butenyl, 1-ethyl-1-butenyl, 1-ethyl-2-butenyl, 1-ethyl-3-butenyl, 2-ethyl- 1-butenyl, 2-ethyl-2-butenyl, 2-ethyl-3-butenyl, 1,1,2-trimethyl-2-propenyl, 1-ethyl-1-methyl-2-propenyl, 1-ethyl-2-methyl-1-propenyl and 1-ethyl-2-methyl-2-propenyl and the different isomers. "Alkenyl" also includes polyenes such as 1,2-propadienyl and 2,4-hexadienyl. This definition also applies to alkenyl as a part of a composite substituent, for example haloalkenyl and the like, unless defined specifically elsewhere.

Representative examples of alkynes include ethynyl, 1-propynyl, 2-propynyl, 1-butynyl, 2-butynyl, 3-butynyl, 1-methyl-2-propynyl, 1-pentynyl, 2-pentynyl, 3-pentynyl, 4-pentynyl, 1-methyl-2-butynyl, 1methyl-3-butynyl, 2-methyl-3-butynyl, 3-methyl-1-butynyl, 1,1-dimethyl-2-propynyl, 1-ethyl -2-propynyl, 1-hexynyl, 2-hexynyl, 3-hexynyl, 4-hexynyl, 5-hexynyl, 1-methyl-2-pentynyl, 1-methyl-3-pentynyl, 1-methyl-4-pentynyl, 2-methyl-3-pentynyl, 2-methyl-4-pentynyl, 3-methyl-1-pentynyl, 3-methyl-4-pentynyl, 4-methyl-1-pentynyl, 4-methyl-2-pentynyl, 1,1-dimethyl-2-butynyl, 1,1-dimethyl-3-

butynyl, l,2-dimethyl-3-butynyl, 2,2-dimethyl-3-butynyl, 3,3-dimethyl-l-butynyl, l-ethyl-2-butynyl, lethyl-3-butynyl, 2-ethyl-3-butynyl and 1-ethyl-l-methyl-2-propynyl and the different isomers. This definition also applies to alkynyl as a part of a composite substituent, for example haloalkynyl etc., unless specifically defined elsewhere. "Alkynyl" can also include moieties comprised of multiple triple bonds such as 2,5-hexadiynyl.

The term "cycloalkyl" or "cyclic alkyl" means alkyl closed to form a ring. Representative examples include but are not limited to cyclopropyl, cyclobutyl, cyclopentyl and cyclohexyl. This definition also applies to cycloalkyl as a part of a composite substituent, for example cycloalkylalkyl etc., unless specifically defined elsewhere. Cycloalkenyl or cyclicalkenyl means alkenyl closed to form a ring including monocyclic, partially unsaturated hydrocarbyl groups. Representative examples include but are not limited to cyclopropenyl, cyclobutenyl, cyclopentenyl and cyclohexenyl. This definition also applies to cycloalkenyl as a part of a composite substituent, for example cycloalkenylalkyl etc., unless specifically defined elsewhere.

The term "halogen", either alone or in compound words such as "haloalkyl", includes fluorine, chlorine, bromine or iodine. Further, when used in compound words such as "haloalkyl", said alkyl may be partially or fully substituted with halogen atoms which may be the same or different. Examples of "haloalkyl" include chloromethyl, bromomethyl, dichloromethyl, trichloromethyl, fluoromethyl, difluoromethyl, trifluoromethyl, chlorofluoromethyl, dichlorofluoromethyl, chlorodifluoromethyl, 1-chloroethyl, 1-bromoethyl, 1-fluoroethyl, 2-fluoroethyl, 2,2-difluoroethyl, 2,2,2-trifluoroethyl, 2-chloro-2-fluoroethyl, 2-chloro-2,2-difluoroethyl, 2,2-dichloro-2-fluoroethyl, 2,2,2-trichloroethyl, pentafluoroethyl, 1,1-dichloro-2,2,2-trifluoroethyl, and 1,1,1-trifluoroprop-2-yl. This definition also applies to haloalkyl as a part of a composite substituent, for example haloalkylaminoalkyl etc., unless specifically defined elsewhere.

The terms "haloalkenyl", "haloalkynyl" are defined analogously except that, instead of alkyl groups, alkenyl and alkynyl groups are present as a part of the substituent.

The term "haloalkoxy" means straight-chain or branched alkoxy groups where some or all of the hydrogen atoms in these groups may be replaced by halogen atoms as specified above. Non-limiting examples of haloalkoxy include chloromethoxy, bromomethoxy, dichloromethoxy, trichloromethoxy, fluoromethoxy, difluoromethoxy, trifluoromethoxy, chlorofluoromethoxy, dichlorofluoromethoxy, chlorodifluoromethoxy, 1-chloroethoxy, 1-bromoethoxy, 1-fluoroethoxy, 2-fluoroethoxy, 2,2-difluoroethoxy, 2,2,2-trifluoroethoxy, 2-chloro-2-fluoroethoxy, 2-chloro-2,2-difluoroethoxy, 2,2-dichloro-

2-fluoroethoxy, 2,2,2-trichloroethoxy, pentafluoroethoxy and 1,1,1-trifluoroprop-2-oxy. This definition also applies to haloalkoxy as a part of a composite substituent, for example haloalkoxyalkyl etc., unless specifically defined elsewhere.

The term "haloalkylthio" means straight-chain or branched alkylthio groups where some or all of the hydrogen atoms in these groups may be replaced by halogen atoms as specified above. Non-limiting examples of haloalkylthio include chloromethylthio, bromomethylthio, dichloromethylthio, trichloromethylthio, fluoromethylthio, difluoromethylthio, trifluoromethylthio, chlorofluoromethylthio, dichlorofluoromethylthio, chlorodifluoromethylthio, 1-chloroethylthio, 1-bromoethylthio, 1-fluoroethylthio, 2-fluoroethylthio, 2,2-difluoroethylthio, 2,2,2-trifluoroethylthio, 2-chloro-2-fluoroethylthio, 2-chloro-2,2-difluoroethylthio, 2,2-dichloro-2-fluoroethylthio, 2,2,2-trichloroethylthio, pentafluoroethylthio and 1,1,1-trifluoroprop-2-ylthio. This definition also applies to haloalkylthio as a part of a composite substituent, for example haloalkylthioalkyl etc., unless specifically defined elsewhere.

The term "aryl" as used herein is a group that contains any carbon-based aromatic group including, but not limited to, benzene, naphthalene, phenyl, biphenyl, anthracene, and the like. The aryl group can be substituted or unsubstituted. In addition, the aryl group can be a single ring structure or comprise multiple ring structures that are either fused ring structures or attached via one or more bridging groups such as a carbon-carbon bond.

The term "aralkyl" refers to aryl hydrocarbon radicals including an alkyl portion as defined above. Non limiting examples include benzyl, phenylethyl, and 6-naphthylhexyl. As used herein, the term "aralkenyl" refers to aryl hydrocarbon radicals including an alkenyl portion, as defined above, and an aryl portion, as defined above. Non limiting examples include styryl, 3-(benzyl) prop-2-enyl, and 6-naphthylhex-2-enyl.

The term "ring" or "ring system" as a component of formula I is carbocyclic or heterocyclic. The term “ring system” denotes one or more rings.

The term "bicyclic ring or ring system" denotes a ring system consisting of two or more common atom.

The terms "carbocycle" or "carbocyclic" or "carbocyclyl" include "aromatic carbocyclic ring system" and "nonaromatic carbocylic ring system" or polycyclic or bicyclic (spiro, fused, bridged, nonfused) ring compounds in which the ring may be aromatic or non-aromatic (where aromatic indicates that the Hueckel rule is satisfied and non-aromatic indicates that the Hueckel rule is not statisfied).

Non limiting examples of non aromatic carbocyclic ring system are cyclopropyl, cyclobutyl, cyclopentyl, norbornyl and the like.

Non limiting examples of aromatic carbocyclic ring system are phenyl, napthalene and the like.

The term "hetero" in connection with rings refers to a ring in which at least one ring atom is not carbon and which can contain 1 to 4 heteroatoms independently selected from the group consisting of nitrogen, oxygen and sulfur, provided that each ring contains no more than 4 nitrogens, no more than 2 oxygens and no more than 2 sulfurs.

The terms "heterocycle" or "heterocyclic" or "heterocyclyl" include "aromatic heterocycle or heteroaryl ring system" and "nonaromatic heterocycle ring system" or polycyclic or bicyclic (spiro, fused, bridged, nonfused) ring compounds in which the ring may be aromatic or non-aromatic, wherein the heterocycle ring contains at least one heteroatom selected from N, O, $S(O)_{0-2}$, and or C ring member of the heterocycle may be replaced by C(=O), C(=S), C(=CR*R*) and C=NR*, * indicates integers (where aromatic heterocycle or heteroaryl ring indicates that the Hueckel rule is satisfied).

The term "non-aromatic heterocycle" means three- to fifteen-membered, preferably three- to twelve-membered, saturated or partially unsaturated heterocycles containing one to four heteroatoms from the group of oxygen, nitrogen and sulphur: mono, bi- or tricyclic heterocycles which contain, in addition to carbon ring members, one to three nitrogen atoms and/or one oxygen or sulphur atom or one or two oxygen and/or sulphur atoms; if the ring contains more than one oxygen atom, they are not directly adjacent; for example (but not limited to) oxiranyl, oxetanyl, aziridinyl, azetidinyl, 2-tetrahydrofuranyl, 3-tetrahydrofuranyl, 2-tetrahydrothienyl, 3-tetrahydrothienyl, 2-pyrrolidinyl, 3-pyrrolidinyl, 3-isoxazolidinyl, 4-isoxazolidinyl, 5-isoxazolidinyl, 3-isothiazolidinyl, 4-isothiazolidinyl, 5-isothiazolidinyl, 3-pyrazolidinyl, 4-pyrazolidinyl, 5-pyrazolidinyl, 2-oxazolidinyl, 4-oxazolidinyl, 5-oxazolidinyl, 2-thiazolidinyl, 4-thiazolidinyl, 5-thiazolidinyl, 2-imidazolidinyl, 4-imidazolidinyl, 1,2,4-oxadiazolidin-3-yl, l,2,4-oxadiazolidin-5-yl, l,2,4-thiadiazolidin-3-yl, 1,2,4-thiadiazolidin-5-yl, l,2,4-triazolidin-3-yl, l,3,4-oxadiazolidin-2-yl, l,3,4-thiadiazolidin-2-yl, 1,3,4-triazolidin-2-yl, 2,3-dihydrofur-2-yl, 2,3-dihydrofur-3-yl, 2,4-dihydrofur-2-yl, 2,4-dihydrofur-3-yl, 2,3-dihydrothien-2-yl, 2,3-dihydrothien-3-yl, 2,4-dihydrothien-2-yl, 2,4-dihydrothien-3-yl, 2-pyrrolin-2-yl, 2-pyrrolin-3-yl, 3-pyrrolin-2-yl, 3-pyrrolin-3-yl, 2-isoxazolin-3-yl, 3-isoxazolin-3-yl, 4-isoxazolin-3-yl, 2-isoxazolin-4-yl, 3-isoxazolin-4-yl, 4-isoxazolin-4-yl, 2-isoxazolin-5-yl, 3-isoxazolin-5-yl, 4-isoxazolin-5-yl, 2-isothiazolin-3-yl, 3-isothiazolin-3-yl, 4-isothiazolin-3-yl, 2-isothiazolin-4-yl, 3-isothiazolin-4-yl, 4-isothiazolin-4-yl, 2-isothiazolin-5-yl, 3-isothiazolin-5-yl, 4-isothiazolin-5-yl, 2,3-dihydropyrazol-l-yl, 2,3-dihydropyrazol-2-yl, 2,3-dihydropyrazol-3-yl, 2,3-dihydropyrazol-4-yl, 2,3-dihydropyrazol-5-yl, 3,4-dihydropyrazol-l-yl, 3,4-dihydropyrazol-3-yl, 3,4-dihydropyrazol-4-yl, 3,4-dihydropyrazol-5-yl, 4,5-dihydropyrazol-l-yl, 4,5-dihydropyrazol-3-yl, 4,5-dihydropyrazol-4-yl, 4,5-dihydropyrazol-5-yl, 2,3-dihydrooxazol-2-yl, 2,3-

dihydrooxazol-3-yl, 2,3-dihydrooxazol-4-yl, 2,3-dihydrooxazol-5-yl, 3,4-dihydrooxazol-2-yl, 3,4-dihydrooxazol-3-yl, 3,4-dihydrooxazol-4-yl, 3,4-dihydrooxazol-5-yl, 3,4-dihydrooxazol-2-yl, 3,4-dihydrooxazol-3-yl, 3,4-dihydrooxazol-4-yl, 2-piperidinyl, 3-piperidinyl, 4-piperidinyl, l,3-dioxan-5-yl, 2-tetrahydropyranyl, 4-tetrahydropyranyl, 2-tetrahydrothienyl, 3-hexahydropyridazinyl, 4-hexahydropyridazinyl, 2-hexahydropyrimidinyl, 4-hexahydropyrimidinyl, 5-hexahydropyrimidinyl, 2-piperazinyl, l,3,5-hexahydrotriazin-2-yl, l,2,4-hexahydrotriazin-3-yl, morpholinyl, thiomorpholinyl, and cycloserines. This definition also applies to heterocyclyl as a part of a composite substituent, for example heterocyclyloalkyl etc., unless specifically defined elsewhere.

The term "heteroaryl" as used herein is a group that contains fused or unfused three to fifteen membered, preferably three to tweleve membered, more preferably 5 or 6 membered; monocyclic or polycyclic unsaturated ring system, containing heteroatoms selected from the group of oxygen, nitrogen, sulphur, phosphorous, boron etc.

Non-limiting examples of 5 membered heteroaryl groups include 2-furyl; 3-furyl; 2-thienyl; 3-thienyl; 2-pyrrolyl; 3-pyrrolyl; 3-isoxazolyl; 4-isoxazolyl; 5-isoxazolyl; 3-isothiazolyl; 4-isothiazolyl; 5-isothiazolyl; 3-pyrazolyl; 4-pyrazolyl; 5-pyrazolyl; 2-oxazolyl; 4-oxazolyl; 5-oxazolyl; 2-thiazolyl; 4-thiazolyl; 5-thiazolyl; 2-imidazolyl; 4-imidazolyl; l,2,4-oxadiazol-3-yl; l,2,4-oxadiazol-5-yl; l,2,4-thiadiazol-3-yl; l,2,4-thiadiazol-5-yl; l,2,4-triazol-3-yl; l,3,4-oxadiazol-2-yl; l,3,4-thiadiazol-2-yl and l,3,4-triazol-2-yl; 1-pyrrolyl; 1-pyrazolyl; 1,2,4-triazol-l- yl; 1-imidazolyl; 1,2,3-triazol-l-yl; 1,3,4-triazol-l-yl and the like.

Non-limiting examples of 6 membered heteroaryl groups include 2-pyridinyl; 3-pyridinyl; 4-pyridinyl; 3-pyridazinyl; 4-pyridazinyl; 2-pyrimidinyl; 4-pyrimidinyl; 5-pyrimidinyl; 2-pyrazinyl; l,3,5-triazin-2-yl; l,2,4-triazin-3-yl; l,2,4,5-tetrazin-3-yl and the like.

Non-limiting examples of benzofused 5-membered heteroaryl include indol-l-yl; indol-2-yl; indol-3-yl; indol-4-yl; indol-5-yl; indol-6-yl; indol-7-yl; benzimidazol-l-yl; benzimidazol-2-yl; benzimidazol-4-yl; benzimidazol-5-yl; indazol-l-yl; indazol-3-yl; indazol-4-yl; indazol-5-yl; indazol-6-yl; indazol-7-yl; indazol-2-yl; l-benzofuran-2-yl; l-benzofuran-3-yl; l-benzofuran-4-yl; l-benzofuran-5-yl; 1-benzofuran- 6-yl; l-benzofuran-7-yl; l-benzothiophen-2-yl; l-benzothiophen-3-yl; l-benzothiophen-4-yl; 1-benzothiophen-5-yl; l-benzothiophen-6-yl; l-benzothiophen-7-yl; l,3-benzothiazol-2-yl; 1,3- benzothiazol-4-yl; l,3-benzothiazol-5-yl; l,3-benzothiazol-6-yl; l,3-benzothiazol-7-yl; l,3-benzoxazol-2-yl; l,3-benzoxazol-4-yl; l,3-benzoxazol-5-yl; 1,3-benzoxazol-6-yl; l,3-benzoxazol-7-yl and the liked.

Non-limiting examples of benzofused 6-membered heteroaryl include quinolin-2-yl; quinolin-3-yl; quinolin-4-yl; quinolin-5-yl; quinolin-6-yl; quinolin-7-yl; quinolin-8-yl; isoquinolin-l-yl; isoquinolin-3-yl; isoquinolin-4-yl; isoquinolin-5-yl; isoquinolin-6-yl; isoquinolin-7-yl; isoquinolin-8-yl and the like.

Non-limiting examples of fused 6-5-membered heteroaryl include Indolizinyl; pyrazolo[1,5-a]pyridinyl; imidazo[1,2-a]pyridinyl; pyrrolo[1,2-a]pyrimidinyl; pyrazolo[1,5-a]pyrimidinyl; imidazo[1,2-a]pyrimidinyl; pyrrolo[1,2-a]pyrazinyl; pyrazolo[1,5-a]pyrazinyl; imidazo[1,2-a]pyrazinyl and the like.

The total number of carbon atoms in a substituent group is indicated by the "C_i-C_j" prefix where i and j are numbers from 1 to 21. For example, C_1-C_3 alkylsulfonyl designates methylsulfonyl through propylsulfonyl; C_2 alkoxyalkyl designates CH_3OCH_2; C_3 alkoxyalkyl designates, for example, $CH_3CH(OCH_3)$, $CH_3OCH_2CH_2$ or $CH_3CH_2OCH_2$; and C_4 alkoxyalkyl designates the various isomers of an alkyl group substituted with an alkoxy group containing a total of four carbon atoms, examples including $CH_3CH_2CH_2OCH_2$ and $CH_3CH_2OCH_2CH_2$. In the above recitations, when a compound of Formula I is comprised of one or more heterocyclic rings, all substituents are attached to these rings through any available carbon or nitrogen by replacement of a hydrogen on said carbon or nitrogen.

When a compound is substituted with a substituent bearing a subscript that indicates that the number of said substituents can exceed 1, said substituents (when they exceed 1) are independently selected from the group of defined substituents. Further, when the subscript m in $(R)_m$ indicates an integer ranging from for example 0 to 4, then the number of substituents may be selected from the integers from 0 and 4 inclusive.

When a group contains a substituent which can be hydrogen, then, when this substituent is taken as hydrogen, it is recognized that said group is being un-substituted.

The embodiments herein and the various features and advantageous details thereof are explained with reference to the non-limiting embodiments in the description. Descriptions of well-known components and processing techniques are omitted so as to not unnecessarily obscure the embodiments herein. The examples used herein are intended merely to facilitate an understanding of ways in which the embodiments herein may be practiced and to further enable those of skilled in the art to practice the embodiments herein. Accordingly, the examples should not be construed as limiting the scope of the embodiments herein.

The foregoing description of the specific embodiments will so fully reveal the general nature of the embodiments herein that others can, by applying current knowledge, readily modify and/or adapt for various applications such specific embodiments without departing from the generic concept, and, therefore, such adaptations and modifications should and are intended to be comprehended within the

meaning and range of equivalents of the disclosed embodiments. It is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation. Therefore, while the embodiments herein have been described in terms of preferred embodiments, those skilled in the art will recognize that the embodiments herein can be practiced with modification within the spirit and scope of the embodiments as described herein.

Any discussion of documents, acts, materials, devices, articles and the like that has been included in this specification is solely for the purpose of providing a context for the disclosure. It is not to be taken as an admission that any or all of these matters form a part of the prior art base or were common general knowledge in the field relevant to the disclosure as it existed anywhere before the priority date of this application.

The numerical values mentioned in the description and the foregoing claims though might form a critical part of the present invention of the present disclosure, any deviation from such numerical values shall still fall within the scope of the present disclosure if that deviation follows the same scientific principle as that of the present invention disclosed in the present disclosure.

The term "pest" for the purpose of the present disclosure includes but is not limited to fungi, stramenopiles (oomycetes), bacteria, nematodes, mites, ticks, insects and rodents.

The term "plant" is understood here to mean all plants and plant populations, such as desired and undesired wild plants or crop plants (including naturally occurring crop plants). Crop plants may be plants which can be obtained by conventional breeding and optimization methods or by biotechnological and genetic engineering methods or combinations of these methods, including the transgenic plants and including the plant cultivars which are protectable and non-protectable by plant breeders' rights.

For the purpose of the present disclosure the term "plant" includes a living organism of the kind exemplified by trees, shrubs, herbs, grasses, ferns, and mosses, typically growing in a site, absorbing water and required substances through its roots, and synthesizing nutrients in its leaves by photosynthesis.

Examples of "plant" for the purpose of the present invention include but are not limited to agricultural crops such as wheat, rye, barley, triticale, oats or rice; beet, e.g. sugar beet or fodder beet; fruits and fruit trees, such as pomes, stone fruits or soft fruits, e.g. apples, pears, plums, peaches, almonds, cherries, strawberries, raspberries, blackberries or gooseberries; leguminous plants, such as lentils, peas, alfalfa or soybeans; oil plants, such as rape, mustard, olives, sunflowers, coconut, cocoa beans, castor oil plants, oil palms, ground nuts or soybeans; cucurbits, such as squashes, cucumber or melons; fiber plants, such as cotton, flax, hemp or jute; citrus fruit and citrus trees, such as oranges, lemons, grapefruits or mandarins;

any horticultural plants, vegetables, such as spinach, lettuce, asparagus, cabbages, carrots, onions, tomatoes, potatoes, cucurbits or paprika; lauraceous plants, such as avocados, cinnamon or camphor; cucurbitaceae; oleaginous plants; energy and raw material plants, such as cereals, corn, soybean, other leguminous plants, rape, sugar cane or oil palm; tobacco; nuts; coffee; tea; cacao; bananas; peppers; vines (table grapes and grape juice grape vines); hop; turf; sweet leaf (also called Stevia); natural rubber plants or ornamental and forestry plants, such as flowers, shrubs, broad-leaved trees or evergreens, e.g. conifers; and on the plant propagation material, such as seeds, and the crop material of these plants.

Preferably, the plant for the purpose of the present invention include but is not limited to cereals, corn, rice, soybean and other leguminous plants, fruits and fruit trees, grapes, nuts and nut trees, citrus and citrus trees, any horticultural plants, cucurbitaceae, oleaginous plants, tobacco, coffee, tea, cacao, sugar beet, sugar cane, cotton, potato, tomato, onions, peppers and vegetables, ornamentals, any floricultural plants and other plants for use of human and animals.

The term "plant parts" is understood to mean all parts and organs of plants above and below the ground. For the purpose of the present disclosure the term plant parts includes but is not limited to cuttings, leaves, twigs, tubers, flowers, seeds, branches, roots including taproots, lateral roots, root hairs, root apex, root cap, rhizomes, slips, shoots, fruits, fruit bodies, bark, stem, buds, auxillary buds, meristems, nodes and internodes.

The term "locus thereof" includes soil, surroundings of plant or plant parts and equipment or tools used before, during or after sowing/planting a plant or a plant part.

Application of the compounds of the present disclosure or the compound of the present disclosure in a composition optionally comprising other compatible compounds to a plant or a plant material or locus thereof include application by a technique known to a person skilled in the art which include but is not limited to spraying, coating, dipping, fumigating, impregnating, injecting and dusting.

The term "applied" means adhered to a plant or plant part either physically or chemically including impregnation.

The present invention further relates to a composition for controlling unwanted microorganisms comprising at least one of the compounds of the formula (I) and one or more inert carrier. The inert carrier further comprises agriculturally suitable auxiliaries, solvents, diluents, surfactants and/or extenders and the like.

The present invention further relates to a composition for controlling unwanted microorganisms, comprising at least one of the compounds of the formula (I) and/or one or more active compatible compound selected from fungicides, bactericides, acaricides, insecticides, nematicides, herbicides, biopesticides, plant growth regulators, antibiotics, fertilizers and/or mixtures thereof.

The present invention also relates to a method for controlling unwanted microorganisms, wherein compounds of the formula (I) are applied to the microorganisms and/or in their habitat.

The present invention further provides a method for protecting seed against unwanted microorganisms by using seed treated with at least one compound of the formula (I).

The compounds of the formula (I) can possess potent microbicidal activity and can be used for the control of unwanted microorganisms, such as fungi, nematodes and bacteria, in crop protection and in the protection of such materials.

The compounds of the formula (I) can possess very good fungicidal properties and can be used in crop protection, for example for control of *Plasmodiophoromycetes, Oomycetes, Chytridiomycetes, Zygomycetes, Ascomycetes, Basidiomycetes and Deuteromycetes.*

The compounds of the formula (I) can be used as nematicides in crop protection, for example, for control of *Rhabditida, Dorylaimida* and *Tryplonchida.*

The compounds of the formula (I) can be used as insecticides in crop protection, for example, for control of *Lepidoptera, Coleoptera, Hemiptera, Homoptera, Thysanoptera, Diptera, Orthoptera* and *Isoptera.*

The compounds of the formula (I) can be used as acaricides in crop protection, for example, for control of *Eriophyoidea, Tetranychoidea, Eupodoidea* and *Tarsonemidae.*

The compounds of the formula (I) can be used as bactericides in crop protection, for example, for control of *Pseudomonadaceae, Rhizobiaceae, Enterobacteriaceae, Corynebacteriaceae* and *Streptomycetaceae.*

The compounds of the formula (I) can be used as herbicides and can be effective against a broad spectrum of economically important mono- and dicotyledonous harmful plants. Monocotyledonous broad-leaved weed species may include Avena, Lolium, Alopecurus, Phalaris, Echinochloa, Digitaria, Setaria and Cyperus species from the annual group and perennial species Agropyron, Cynodon, Imperata and Sorghum and also perennial Cyperus species. Dicotyledonous broad-leaved weed species may include Galium, Viola, Veronica, Lamium, Stellaria, Amaranthus, Sinapis, Ipomoea, Sida, Matricaria and

Abutilon on the annual side, and also Convolvulus, Cirsium, Rumex and Artemisia in the case of the perennial broad-leaved weeds. Harmful plants that occur in rice, such as, for example, Echinochloa, Sagittaria, Alisma, Eleocharis, Scirpus and Cyperus, can be controlled by the compounds of formula (I).

The compounds of the formula (I) can be used for curative or protective control of phytopathogenic fungi. The present invention therefore also relates to curative and protective methods for controlling phytopathogenic fungi by the use of the active ingredients or compositions, which are applied to the seed, the plant or plant parts, the fruit or the soil in which the plants grow.

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

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

The active ingredients can be applied as such or converted to the customary formulations or in the form of their formulations or the use forms prepared therefrom, such as ready-to-use solutions, emulsions, water- or oil-based suspensions, powders, wettable powders, pastes, soluble powders, soluble tablets, dusts, soluble granules, granules for broadcasting, suspoemulsion concentrates, natural products impregnated with active

ingredient, synthetic substances impregnated with active ingredient, fertilizers and also microencapsulations in polymeric substances. Application is accomplished in a customary manner, for example by watering, spraying, atomizing, nursery boxes, broadcasting, dusting, foaming, spreading-on and the like. It is also possible to deploy the active ingredients by the ultra-low volume method or to inject the active ingredient preparation or the active ingredient itself into the soil. It is also possible to treat the seed of the plants.

The active ingredients can be further converted to the nanoformulation with intent to further improve water solubility, thermal stability, bioavailability, sensory attributes and physiological performance.

Furthermore, the choice of the type of formulation will depend on the specific use.

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

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

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

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

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

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

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

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

The invention also relates to agrochemical compositions comprising an auxiliary and at least one compound of formula (I) according to the invention.

An agrochemical composition comprises a fungicidally effective amount of a compound of formula (I). The term "effective amount" denotes an amount of the composition or of the compounds of formula (I), which is sufficient for controlling harmful fungi on cultivated plants or in the protection of materials and which does not result in a substantial damage to the treated plants. Such an amount can vary in a broad range and is dependent on various factors, such as the fungal species to be controlled, the treated cultivated plant or material, the climatic conditions and the specific compound of formula (I) used.

The compounds of formula (I), their oxides and salts can be converted into customary types of

agrochemical compositions, e. g. solutions, emulsions, suspensions, dusts, powders, pastes, granules, pressings, capsules, and mixtures thereof. Examples for composition types are suspensions (e.g. SC, OD, FS), emulsifiable concentrates (e.g. EC), emulsions (e.g. EW, EO, ES, ME), cap sules (e.g. CS, ZC), pastes, pastilles, wettable powders or dusts (e.g. WP, SP, WS, DP, DS), pressings (e. g. BR, TB, DT), granules (e. g. WG, SG, GR, FG, GG, MG), insecticidal articles (e.g. LN), as well as gel formulations for the treatment of plant propagation materials such as seeds (e. g. GF). These and further compositions types are defined in the "Catalogue of pesticide formulation types and international coding system", Technical Monograph No. 2, 61h Ed. May 2008, Croplife International.

The compositions are prepared in a known manner, such as described by Mollet and Grube mann, Formulation technology, Wiley VCH, Weinheim, 2001; or Knowles, New developments in crop protection product formulation, Agrow Reports DS243, TandF lnforma, London, 2005.

Suitable auxiliaries are solvents, liquid carriers, solid carriers or fillers, surfactants, dispersants, emulsifiers, wetters, adjuvants, solubilizers, penetration enhancers, protective colloids, adhesion agents, thickeners, humectants, repellents, attractants, feeding stimulants, compatibilizers, bactericides, anti-freezing agents, anti-foaming agents, colorants, tackifiers and binders.

Suitable solvents and liquid carriers are water and organic solvents, such as mineral oil fractions of medium to high boiling point, e. g. kerosene, diesel oil; oils of vegetable or animal origin; aliphatic, cyclic and aromatic hydrocarbons, e. g. toluene, paraffin, tetrahydronaphthalene, alkylated naphthalenes; alcohols, e.g. ethanol, propanol, butanol, benzyl alcohol, cyclohexanol; glycols; DMSO; ketones, e. g. cyclohexanone; esters, e. g. lactates, carbonates, fatty acid esters, gamma-butyrolactone; fatty acids; phosphonates; amines; amides, e. g. N-methyl pyrrolidone, fatty acid dimethyl amides; and mixtures thereof.

Suitable solid carriers or fillers are mineral earths, e. g. silicates, silica gels, talc, kaolins, limestone, lime, chalk, clays, dolomite, diatomaceous earth, bentonite, calcium sulfate, magnesium sulfate, magnesium oxide; polysaccharides, e. g. cellulose, starch; fertilizers, e. g. ammonium sulfate, ammonium phosphate, ammonium nitrate, ureas; products of vegetable origin, e. g. cereal meal, tree bark meal, wood meal, nutshell meal, and mixtures thereof.

Suitable surfactants are surface-active compounds, such as anionic, cationic, nonionic and amphoteric surfactants, block polymers, polyelectrolytes, and mixtures thereof. Such surfactants can be used as emulsifier, dispersant, solubilizer, wetter, penetration enhancer, protective colloid, or adjuvant. Examples of surfactants are listed in McCutcheon's, Vol.1: Emulsifiers and Detergents, McCutcheon's Directories, Glen Rock, USA, 2008 (International Ed. or North American Ed.).

Suitable anionic surfactants are alkali, alkaline earth or ammonium salts of sulfonates, sulfates, phosphates, carboxylates, and mixtures thereof. Examples of sulfonates are alkylaryl sulfonates, diphenyl sulfonates, alpha-olefin sulfonates, lignin sulfonates, sulfonates of fatty acids and oils, sulfonates of ethoxylated alkylphenols, sulfonates of alkoxylated arylphenols, sulfonates of condensed naphthalenes, sulfonates of dodecyl and tridecylbenzenes, sulfonates of naphthalenes and alkyl naphthalenes, sulfosuccinates or sulfosuccinamates. Examples of sulfates are sulfates of fatty acids and oils, of ethoxylated alkylphenols, of alcohols, of ethoxylated alcohols, or of fatty acid esters. Examples of phosphates are phosphate esters. Examples of carboxylates are alkyl carboxylates, and carboxylated alcohol or alkylphenol ethoxylates.

Suitable nonionic surfactants are alkoxylates, N-substituted fatty acid amides, amine oxides, esters, sugar-based surfactants, polymeric surfactants, and mixtures thereof. Examples of alkoxylates are compounds such as alcohols, alkylphenols, amines, amides, arylphenols, fatty acids or fatty acid esters which have been alkoxylated with 1 to 50 equivalents. Ethylene oxide and/or propylene oxide may be employed for the alkoxylation, preferably ethylene oxide. Exampies of N-substituted fatty acid amides are fatty acid glucamides or fatty acid alkanolamides. Examples of esters are fatty acid esters, glycerol esters or monoglycerides. Examples of sugarbased surfactants are sorbitans, ethoxylated sorbitans, sucrose and glucose esters or alkylpolyglucosides. Examples of polymeric surfactants are home- or copolymers of vinyl pyrrolidone, vinyl alcohols, or vinyl acetate.

Suitable cationic surfactants are quaternary surfactants, for example quaternary ammonium compounds with one or two hydrophobic groups, or salts of long-chain primary amines. Suitable amphoteric surfactants are alkylbetains and imidazolines. Suitable block polymers are block polymers of the A-B or A-B-A type comprising blocks of polyethylene oxide and polypropylene oxide, or of the A-B-C type comprising alkanol, polyethylene oxide and polypropylene oxide.

Suitable polyelectrolytes are polyacids or polybases. Examples of polyacids are alkali salts of polyacrylic acid or polyacid comb polymers. Examples of polybases are polyvinyl amines or polyethylene amines.

Suitable adjuvants are compounds, which have a negligible or even no pesticidal activity them selves, and which improve the biological performance of the compound of formula (I) on the target. Examples are surfactants, mineral or vegetable oils, and other auxiliaries. Further examples are listed by Knowles, Adjuvants and additives, Agrow Reports DS256, TandF Informa UK, 2006, chapter 5.

Suitable thickeners are polysaccharides (e. g. xanthan gum, carboxymethyl cellulose), inorganic clays (organically modified or unmodified), polycarboxylates, and silicates.

Suitable bactericides are bronopol and isothiazolinone derivatives such as alkylisothiazolinones and benzisothiazolinones.

Suitable anti-freezing agents are ethylene glycol, propylene glycol, urea and glycerin. Suitable anti-foaming agents are silicones, long chain alcohols, and salts of fatty acids. Suitable colorants (e. g. in red, blue, or green) are pigments of low water solubility and watersoluble dyes. Examples are inorganic colorants (e. g. iron oxide, titan oxide, iron hexacyanoferrate) and organic colorants (e.g. alizarin-, azo- and phthalocyanine colorants).

Suitable tackifiers or binders are polyvinyl pyrrolidones, polyvinyl acetates, polyvinyl alcohols, polyacrylates, biological or synthetic waxes, and cellulose ethers.

Examples for composition types and their preparation are:

i) Water-soluble concentrates (SL, LS)

10-60 wt% of a compound of formula (I) and 5-15 wt% wetting agent (e.g. alcohol alkoxylates) are dissolved in water and/or in a water-soluble solvent (e. g. alcohols) ad 100 wt%. The active substance dissolves upon dilution with water.

ii) Dispersible concentrates (DC)

5-25 wt% of a compound of formula (I) and 1-10 wt% dispersant (e.g. polyvinyl pyrrolidone) are dissolved in organic solvent (e. g. cyclohexanone) ad 100 wt%. Dilution with water gives dispersion.

iii) Emulsifiable concentrates (EC)

15-70 wt% of a compound of formula (I) and 5-10 wt% emulsifiers (e.g. calcium dodecylbenzenesulfonate and castor oil ethoxylate) are dissolved in water-insoluble organic solvent (e. g. aromatic hydro carbon) ad 100 wt%. Dilution with water gives an emulsion.

iv) Emulsions (EW, EO, ES)

5-40 wt% of a compound of formula (I) and 1-10 wt% emulsifiers (e.g. calcium dodecylbenzenesulfonate and castor oil ethoxylate) are dissolved in 20-40 wt% water-insoluble organic solvent (e.g. aro matic hydrocarbon). This mixture is introduced into water ad 100 wt% by means of an emulsifying machine and made into a homogeneous emulsion. Dilution with water gives an emulsion.

v) Suspensions (SC, OD, FS)

In an agitated ball mill, 20-60 wt% of a compound of formula (I) are comminuted with addition of 2-10 wt% dispersants and wetting agents (e. g. sodium lignosulfonate and alcohol ethoxylate), 0.1-2 wt%

thickener (e.g. xanthan gum) and water ad 100 wt% to give a fine active substance suspension. Dilution with water gives a stable suspension of the active substance. For FS type composition up to 40 wt% binder (e. g. polyvinyl alcohol) is added.

vi) Water-dispersible granules and water-soluble granules (WG, SG)

50-80 wt% of a compound of formula (I) are ground finely with addition of dispersants and wetting agents (e.g. sodium lignosulfonate and alcohol ethoxylate) ad 100 wt% and prepared as water-dispersible or water-soluble granules by means of technical appliances (e.g.extrusion, spray tower, fluidized bed). Dilution with water gives a stable dispersion or solution of the active substance.

vii) Water-dispersible powders and water-soluble powders (WP, SP, WS)

50-80 wt% of a compound of formula (I) are ground in a rotor-stator mill with addition of 1-5 wt% dispersants (e.g. sodium lignosulfonate), 1-3 wt% wetting agents (e.g. alcohol ethoxylate) and solid carrier (e.g. silica gel) ad 100 wt%. Dilution with water gives a stable dispersion or solution of the active substance.

viii) Gel (GW, GF)

In an agitated ball mill, 5-25 wt% of a compound of formula (I) are comminuted with addition of 3-10 wt% dispersants (e.g. sodium lignosulfonate), 1-5 wt% thickener (e.g. carboxymethyl cellulose) and water ad 100 wt% to give a fine suspension of the active substance. Dilution with water gives a stable suspension of the active substance.

ix) Microemulsion (ME)

5-20 wt% of a compound of formula (I) are added to 5-30 wt% organic solvent blend (e. g. fatty acid dimethyl amide and cyclohexanone), 10-25 wt% surfactant blend (e. g. alcohol ethoxylate and arylphenol ethoxylate), and water ad 100 %. This mixture is stirred for 1 h to produce spontane ously a thermodynamically stable microemulsion.

x) Microcapsules (CS)

An oil phase comprising 5-50 wt% of a compound of formula (I), 0-40 wt% water insoluble organic solvent (e.g. aromatic hydrocarbon), 2-15wt% acrylic monomers (e.g. methylmethacrylate, methacrylic acid and a di- or tri-acrylate) are dispersed into an aqueous solution of a protective colloid (e.g. polyvinyl alcohol). Radical polymerization results in the formation of poly(meth)acrylate microcapsules. Alternatively, an oil phase comprising 5-50 wt% of a compound of formula (I) according to the invention, 0-40 wt% water insoluble organic solvent (e. g. aromatic hydrocarbon), and an isocyanate monomer (e.g. diphenylmethene-4,4'-diisocyanatae) are dispersed into an aqueous

solution of a protective colloid (e. g. polyvinyl alcohol). The addition of a polyamine (e.g. hexameth ylenediamine) results in the formation of polyurea microcapsules. The monomers amount to 1- 10 wt%. The wt% relate to the total CS composition.

xi) Dustable powders (DP, DS)

1-10 wt% of a compound of formula (I)is ground finely and mixed intimately with solid carrier (e.g. finely divided kaolin) ad 100 wt%.

xii) Granules (GR, FG)

0.5-30 wt% of a compound of formula (I) is ground finely and associated with solid carrier (e. g. silicate) ad 100 wt%. Granulation is achieved by extrusion, spray-drying or fluidized bed.

xiii) Ultra-low volume liquids (UL)

1-50 wt% of a compound of formula (I) are dissolved in organic solvent (e.g. aromatic hydrocarbon) ad 100 wt%.

The compositions types i) to xiii) may optionally comprise further auxiliaries, such as 0.1-1 wt% bactericides, 5-15 wt% anti-freezing agents, 0.1-1 wt% anti-foaming agents, and 0.1-1 wt% colorants.

The agrochemical compositions generally comprise between 0.01 and 95%, preferably between 0.1 and 90%, and in particular between 0.5 and 75%, by weight of active substance.

The active substances are employed in a purity of from 90% to 100%, preferably from 95% to 100% (according to NMR spectrum).

For the purposes of treatment of plant propagation materials, particularly seeds, solutions for seed treatment (LS), Suspoemulsions (SE), flowable concentrates (FS), powders for dry treatment (DS), water-dispersible powders for slurry treatment (WS), water-soluble powders (SS), emulsions (ES), emulsifiable concentrates (EC), and gels (GF) are usually employed. The com positions in question give, after two-to-tenfold dilution, active substance concentrations of from 0.01 to 60% by weight, preferably from 0.1 to 40%, in the ready-to-use preparations. Application can be carried out before or during sowing. Methods for applying compound of formula (I) and compositions thereof, respectively, onto plant propagation material, especially seeds, include dressing, coating, pelleting, dusting, and soaking as well as in-furrow application methods. Preferably, compound of formula (I) or the compositions thereof, respectively, are applied on to the plant propagation material by a method such that germination is not induced, e.g. by seed dressing, pelleting, coating and dusting.

When employed in plant protection, the amounts of active substances applied are, depending on the kind of effect desired, from 0.001 to 2 kg per ha, preferably from 0.005 to 2 kg per ha, more preferably from

0.05 to 0.9 kg per ha, and in particular from 0.1 to 0.75 kg per ha.

In treatment of plant propagation materials such as seeds, e.g. by dusting, coating or drenching seed, amounts of active substance of from 0.1 to 1000 g, preferably from 1 to 1000 g, more preferably from 1 to 100 g and most preferably from 5 to 100 g, per 100 kilogram of plant propagation material (preferably seeds) are generally required.

When used in the protection of materials or stored products, the amount of active substance applied depends on the kind of application area and on the desired effect. Amounts customarily applied in the protection of materials are 0.001 g to 2 kg, preferably 0.005 g to 1 kg, of active substance per cubic meter of treated material.

Various types of oils, wetters, adjuvants, fertilizer, or micronutrients, and further pesticides (e. g. herbicides, insecticides, fungicides, growth regulators, safeners, biopesticides) may be added to the active substances or the compositions comprising them as premix or, if appropriate not until immediately prior to use (tank mix). These agents can be admixed with the compositions ac cording to the invention in a weight ratio of 1:100 to 100:1, preferably 1:10 to 10:1.

A pesticide is generally a chemical or biological agent (such as pestidal active ingredient, compound, composition, virus, bacterium, antimicrobial or disinfectant) that through its effect deters, incapacitates, kills or otherwise discourages pests. Target pests can include insects, plant pathogens, weeds, mollusks, birds, mammals, fish, nematodes (roundworms), and microbes that destroy property, cause nuisance, spread disease or are vectors for disease. The term pesticides includes also plant growth regulators that alter the expected growth, flowering, or reproduction rate of plants; defoliants that cause leaves or other foliage to drop from a plant, usually to facilitate harvest; desiccants that promote drying of living tissues, such as unwanted plant tops; plant activators that activate plant physiology for defense of against certain pests; safeners that reduce unwanted herbicidal action of pesticides on crop plants; and plant growth promoters that affect plant physiology to increase plant growth, biomass, yield or any other quality parameter of the harvestable goods of a crop plant.

Biopesticides have been defined as a form of pesticides based on micro-organisms (bacteria, fungi, viruses, nematodes, etc.) or natural products (compounds, such as metabolites, proteins, or extracts from biological or other natural sources) (U.S. Environmental Protection Agency: http://www.epa.gov/pesticides/biopesticides/). Biopesticides are typically created by growing and concentrating naturally occurring organisms and/or their metabolites including bacteria and other microbes, fungi, viruses, nematodes, proteins, etc. They are often considered to be important components of integrated pest management (IPM) programs.

Biopesticides fall into two major classes, microbial and biochemical pesticides:

1. Microbial pesticides consist of bacteria, fungi or viruses (and often include the metabolites that bacteria and fungi produce). entomopathogenic nematodes are also classed as microbial pesticides, even though they are multicellular.

2. Biochemical pesticides are naturally occurring substances that control pests or provide other crop protection uses as defined below, but are relatively non-toxic to mammals

The user applies the composition according to the invention usually from a pre dosage device, a knapsack sprayer, a spray tank, a spray plane, or an irrigation system. Usually, the agrochemical composition is made up with water, buffer, and/or further auxiliaries to the desired application concentration and the ready-to-use spray liquor or the agrochemical composition according to the invention is thus obtained. Usually, 20 to 2000 liters, preferably 50 to 400 liters, of the ready-to-use spray liquor are applied per hectare of agricultural useful area.

The present invention further relates to a composition for controlling unwanted microorganisms comprising at least one of the compounds of the formula (I) and one or more inert carrier. The inert carrier further comprises agriculturally suitable auxiliaries, solvents, diluents, surfactants and/or extenders and the like.

The present invention further relates to a composition for controlling unwanted microorganisms, comprising at least one of the compounds of the formula (I) and/or one or more active compatible compound selected from fungicides, bactericides, acaricides, insecticides, nematicides, herbicides, biopesticides, plant growth regulators, antibiotics, fertilizers and/or mixtures thereof.

Generally, a compound of the present invention is used in the form of a composition (e.g. formulation) containing a carrier. A compound of the invention and compositions thereof can be used in various forms such as aerosol dispenser, 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, granule, hot fogging concentrate, macrogranule, microgranule, oil dispersible powder, oil miscible flowable concentrate, oil miscible liquid, paste, plant rodlet, powder for dry seed treatment, seed coated with a pesticide, soluble concentrate, soluble powder, solution for seed treatment, suspension concentrate (flowable concentrate), ultra-low volume (ulv) liquid, ultra-low volume (ulv) suspension, 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.

A formulation typically comprises a liquid or solid carrier and optionally one or more customary formulation auxiliaries, which may be solid or liquid auxiliaries, for example unepoxidized or epoxidized vegetable oils (for example epoxidized coconut oil, rapeseed oil or soya oil), antifoams, for example silicone oil, preservatives, clays, inorganic compounds, viscosity regulators, surfactant, binders and/or tackifiers. The composition may also further comprise a fertilizer, a micronutrient donor or other preparations which influence the growth of plants as well as comprising a combination containing the compound of the invention with one or more other biologically active agents, such as bactericides, fungicides, nematicides, plant activators, acaricides, and insecticides.

Accordingly, the present invention also makes available a composition comprising a compound of the invention and an agronomical carrier and optionally one or more customary formulation auxiliaries. The compositions are prepared in a manner known per se, in the absence of auxiliaries for example by grinding, screening and/or compressing a solid compound of the present invention and in the presence of at least one auxiliary for example by intimately mixing and/or grinding the compound of the present invention with the auxiliary (auxiliaries). In the case of solid compounds of the invention, the grinding/milling of the compounds is to ensure specific particle size. These processes for the preparation of the compositions and the use of the compounds of the invention for the preparation of these compositions are also a subject of the invention.

As a rule, the compositions comprise 0.1 to 99%, especially 0.1 to 95%, of compound according to the present invention and 1 to 99.9%, especially 5 to 99.9%, of at least one solid or liquid carrier, it being possible as a rule for 0 to 25%, especially 0.1 to 20%, of the composition to be surfactants (% in each case meaning percent by weight). Whereas concentrated compositions tend to be preferred for commercial goods, the end consumer as a rule uses dilute compositions which have substantially lower concentrations of active ingredient.

Examples of foliar formulation types for pre-mix compositions are:

GR: Granules	EW: emulsions, oil in water
WP: wettable powders	ME: micro-emulsion
WG: water dispersable granules (powders)	SC: aqueous suspension concentrate
SG: water soluble granules	CS: aqueous capsule suspension
SL: soluble concentrates	OD: oil-based suspension concentrate, and
EC: emulsifiable concentrate	SE: aqueous suspo-emulsion.

Whereas, examples of seed treatment formulation types for pre-mix compositions are:

WS: wettable powders for seed treatment slurry	FS: Suspension concentrates for seed treatment
LS: solution for seed treatment	WG: water dispersible granules, and
ES: emulsions for seed treatment	CS: aqueous capsule suspension.

Examples of formulation types suitable for tank-mix compositions are solutions, dilute emulsions, suspensions, or a mixture thereof, and dusts.

As with the nature of the formulations, the methods of application, such as foliar, drench, spraying, atomizing, dusting, scattering, coating or pouring, are chosen in accordance with the intended objectives and the prevailing circumstances.

The tank-mix compositions are generally prepared by diluting with a solvent (for example, water) the one or more pre-mix compositions containing different pesticides, and optionally further auxiliaries. Suitable carriers and adjuvants can be solid or liquid and are the substances ordinarily employed in formulation technology, e.g. natural or regenerated mineral substances, solvents, dispersants, wetting agents, tackifiers, thickeners, binders or fertilizers.

Generally, a tank-mix formulation for foliar or soil application comprises 0.1 to 20 %, especially 0.1 to 15 %, of the desired ingredients, and 99.9 to 80 %, especially 99.9 to 85 %, of a solid or liquid auxiliaries (including, for example, a solvent such as water), where the auxiliaries can be a surfactant in an amount of 0 to 20 %, especially 0.1 to 15 %, based on the tank-mix formulation. Typically, a pre-mix formulation for foliar application comprises 0.1 to 99.9 %, especially 1 to 95 %, of the desired ingredients, and 99.9 to 0.1 %, especially 99 to 5 %, of a solid or liquid adjuvant (including, for example, a solvent such as water), where the auxiliaries can be a surfactant in an amount of 0 to 50 %, especially 0.5 to 40 %, based on the pre-mix formulation.

Normally, a tank-mix formulation for seed treatment application comprises 0.25 to 80 %, especially 1 to 75 %, of the desired ingredients, and 99.75 to 20 %, especially 99 to 25 %, of a solid or liquid auxiliaries (including, for example, a solvent such as water), where the auxiliaries can be a surfactant in an amount of 0 to 40 %, especially 0.5 to 30 %, based on the tank-mix formulation.

Typically, a pre-mix formulation for seed treatment application comprises 0.5 to 99.9 %, especially 1 to 95 %, of the desired ingredients, and 99.5 to 0.1 %, especially 99 to 5 %, of a solid or liquid adjuvant (including, for example, a solvent such as water), where the auxiliaries can be a surfactant in an amount of 0 to 50 %, especially 0.5 to 40 %, based on the pre-mix formulation whereas commercial products will preferably be formulated as concentrates (e.g., pre-mix composition (formulation)), the end user

will normally employ dilute formulations (e.g., tank mix composition).

Preferred seed treatment pre-mix formulations are aqueous suspension concentrates. The formulation can be applied to the seeds using conventional treating techniques and machines, such as fluidized bed techniques, the roller mill method, rotostatic seed treaters, and drum coaters. Other methods, such as spouted beds may also be useful. The seeds may be pre sized before coating. After coating, the seeds are typically dried and then transferred to a sizing machine for sizing. Such procedures are known in the art. The compounds of the present invention are particularly suited for use in soil and seed treatment applications.

In general, the pre-mix compositions of the invention contain 0.5 to 99.9 especially 1 to 95, advantageously 1 to 50 %, by mass of the desired ingredients, and 99.5 to 0.1, especially 99 to 5 %, by mass of a solid or liquid adjuvant (including, for example, a solvent such as water), where the auxiliaries (or adjuvant) can be a surfactant in an amount of 0 to 50, especially 0.5 to 40 %, by mass based on the mass of the pre-mix formulation.

A compound of the formula (I) in a preferred embodiment, independent of any other embodiments, is in the form of a plant propagation material treating (or protecting) composition, wherein said plant propagation material protecting composition may comprises additionally a colouring agent. The plant propagation material protecting composition or mixture may also comprise at least one polymer from water-soluble and water-dispersible film-forming polymers that improve the adherence of the active ingredients to the treated plant propagation material, which polymer generally has an average molecular weight of at least 10,000 to about 100,000.

Examples of application methods for the compounds of the invention and compositions thereof, that is the methods of controlling pests in the agriculture, are spraying, atomizing, dusting, brushing on, dressing, scattering or pouring which are to be selected to suit the intended aims of the prevailing circumstances.

One method of application in agriculture is application to the foliage of the plants (foliar application), it being possible to select frequency and rate of application to match the danger of infestation with the pest or fungi in question. Alternatively, the active ingredient can reach the plants via the root system (systemic action), by applying the compound to the locus of the plants, for example by application of a liquid composition of the compound into the soil (by drenching), or by applying a solid form of the compound in the form of granules to the soil (soil application). In the case of paddy rice plants, such granules can be metered into the flooded paddy-field. The application of the compounds of the present invention to the soil is a preferred application method.

Typical rates of application per hectare is generally 1 to 2000 g of active ingredient per hectare, in

particular 10 to 1000 g/ha, preferably 10 to 600 g/ha, such as 50 to 300 g/ha.

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

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

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

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

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

The formulations described above can be used for controlling unwanted microorganisms, in which the compositions comprising compounds of the formula (I) are applied to the microorganisms and/or in their habitat.

Compounds of the formula (I) according to this invention, as well as salts, N-oxides, metal complexes, stereoisomers or polymorphs can be used as such or in formulations thereof and can be mixed with known mixing partners in order to broaden, for example, the activity spectrum or to prevent development of resistance. Useful mixing partners include, for example, known fungicides, insecticides, acaricides, nematicides, biopesticides and bactericides. A mixture with other known active ingredients, such as herbicides, or with fertilizers and growth regulators, safeners and/or semiochemicals, is also possible.

According to one embodiment, individual components of the composition according to the invention such as parts of a kit or parts of a binary or ternary mixture may be mixed by the user himself in a spray tank or any other kind of vessel used for applications (e. g. seed treater drums, seed pelleting machinery, knapsack sprayer) and further auxiliaries may be added, if appropriate.

Consequently, one embodiment of the invention is a kit for preparing a usable pesticidal composition, the kit comprising a) a composition comprising component 1) as defined herein and at least one auxiliary; and b) a composition comprising component 2) as defined herein and at least one auxiliary; and optionally c) a composition comprising at least one auxiliary and optionally a further active component 3) as defined herein.

The compound/s of Formula I, the combinations and the compositions thereof comprising them in the use as fungicides with other fungicides may result in an expansion of the fungicidal spectrum of activity being obtained or in a prevention of fungicide resistance development. Furthermore, in many cases, extraordinary effects are obtained.

The present invention also relates to the combination comprising at least one compound of Formula I and at least one further pesticidally active substance selected from the group of fungicides, insecticides, nematicides, acaricides, biopesticides, herbicides, safeners, plant growth regulators, antibiotics, fertiliers and nutrients. The pesticidally active substances reported in WO2015185485 pages 36-43 and WO2017093019 pages 42-56 can be used in conjunction with which the compound/s of Formula I.

The active substances referred to as component 2, their preparation and their activity e. g. against harmful fungi is known (cf.: http://www.alanwood.net/pesticides/); these substances are commercially available. The compounds described by IU PAC nomenclature, their preparation and their pesticidal activity are also known (cf. Can. J. Plant Sci. 48(6), 587-94, 1968; EP141317; EP152031; EP226917; EP243970; EP256503; EP428941 ; EP532022; EP1028125; EP1035122; EP1201648; EP1122244, JP2002316902; DE19650197; DE10021412; DE102005009458; US3296272; US3325503; WO9846608; WO9914187; WO9924413; WO9927783; WO0029404; WO0046148; WO0065913; WO0154501 ; WO 0156358; WO0222583; WO0240431; WO0310149; WO0311853; WO0314103; WO0316286; WO0353145; WO0361388; WO0366609; WO0374491; WO0449804; WO0483193; WO05120234; WO05123689; WO05123690; WO0563721; WO0587772; WO0587773; WO0615866; WO0687325; WO0687343; WO0782098; WO0790624; WO11028657; WO2012168188; WO2007006670; WO201177514; WO13047749; WO10069882; WO13047441; WO0316303; WO0990181; WO13007767; WO1310862; WO13127704; WO13024009; WO13024010; WO13047441; WO13162072; WO13092224 and WO11135833.

The present invention furthermore relates to agrochemical mixtures comprising at least one compound of Formula I (component 1) and at least one further active substance useful for plant protection, e. g. selected from the groups A) to O) (component 2), in particular one further fungicide, e. g. one or more fungicide from the groups A) to K), as described above, and if desired one suitable solvent or solid

carrier. Furthermore, combating harmful fungi with a mixture of compound/s of Formula I and at least one fungicide from groups A) to K), as described above, is advantageous than combating those fungi with individual compound/s of Formula I or individual fungicides from groups A) to K).

By applying compound/s of Formula I together with at least one pesticidally active substance from groups A) to O) an enhanced effect can be obtained.

This can be obtained by applying the compound/s of Formula I and at least one further pesticidally active substance simultaneously, either jointly (e. g. as tank-mix) or separately, or in succession, wherein the time interval between the individual applications is selected to ensure that the active substance applied first still occurs at the site of action in a sufficient amount at the time of application of the further pesticidally active substance(s). The order of application is not essential for working of the present invention.

The compounds of formula (I) may be used to treat several fungal pathogens. Non-limiting examples of pathogens of fungal diseases which can be treated in accordance with the invention include:

diseases caused by powdery mildew pathogens, for example *Blumeria* species, for example *Blumeria graminis*; *Podosphaera* species, for example *Podosphaera leucotricha*; *Sphaerotheca* species, for example *Sphaerotheca fuliginea*; *Uncinula* species, for example *Uncinula necator*; *Erysiphe* species, for example *Erysiphe cichoracearu*;

diseases caused by rust disease pathogens, for example *Gymnosporangium* species, for example *Gymnosporangium sabinae*; *Hemileia* species, for example *Hemileia vastatrix*; *Phakopsora* species, for example *Phakopsora pachyrhizi* or *Phakopsora meibomiae*; *Puccinia* species, for example *Puccinia recondita*, *Puccinia graminis* or *Puccinia striiformis,and and Puccinia melanocephala*; *Uromyces* species, for example *Uromyces appendiculatus*;

In particular, Cronartium ribicola (White pine blister rust); *Gymnosporangium juniperi-virginianae* (Cedar-apple rust); *Hemileia vastatrix* (Coffee rust); *Phakopsora meibomiae* and *P. pachyrhizi* (Soybean rust); *Puccinia coronata* (Crown Rust of Oats and Ryegrass); *Puccinia graminis* (Stem rust of wheat and Kentucky bluegrass, or black rust of cereals); *Puccinia hemerocallidis* (Daylily rust); *Puccinia persistens subsp. triticina* (wheat rust or 'brown or red rust'); *Puccinia sorghi* (rust in corn); *Puccinia striiformis* ('Yellow rust' in cereals); *Puccinia melanocephala*; *Uromyces appendiculatus* (rust of beans); *Uromyces phaseoli* (Bean rust); *Puccinia melanocephala* ('Brown rust' in sugarcane); *Puccinia kuehnii* ('Orange rust' in sugarcane).

diseases caused by pathogens from the group of the Oomycetes, for example *Albugo* species, for example *Albugo candida*; *Bremia* species, for example *Bremia lactucae*; *Peronospora* species, for example *Peronospora pisi* or *P. brassicae*; *Phytophthora* species, for example *Phytophthora infestans*; *Plasmopara* species, for example *Plasmopara viticola*; *Pseudoperonospora* species, for example *Pseudoperonospora humuli* or *Pseudoperonospora cubensis*; *Pythium* species, for example *Pythium ultimum*;

leaf blotch diseases and leaf wilt diseases caused, for example, by *Alternaria* species, for example *Alternaria solani*; *Cercospora* species, for example *Cercospora beticola*; *Cladiosporium* species, for example *Cladiosporium cucumerinum*; *Cochliobolus* species, for example *Cochliobolus sativus* (conidial form: Drechslera, syn: Helminthosporium) or *Cochliobolus miyabeanus*; *Colletotrichum* species, for example *Colletotrichum lindemuthanium*; *Cycloconium* species, for example *Cycloconium oleaginum*; *Diaporthe* species, for example *Diaporthe citri*; *Elsinoe* species, for example *Elsinoe fawcettii*; *Gloeosporium* species, for example *Gloeosporium laeticolor*; *Glomerella* species, for example *Glomerella cingulata*; *Guignardia* species, for example *Guignardia bidwelli*; *Leptosphaeria* species, for example *Leptosphaeria maculans*; *Magnaporthe* species, for example *Magnaporthe grisea*; *Microdochium* species, for example *Microdochium nivale*; *Mycosphaerella* species, for example *Mycosphaerella graminicola*, *Mycosphaerella arachidicola* or *Mycosphaerella fijiensis*; *Phaeosphaeria* species, for example *Phaeosphaeria nodorum; Pyrenophora* species, for example *Pyrenophora teres* or *Pyrenophora tritici repentis*; *Ramularia* species, for example *Ramularia collo-cygni* or *Ramularia areola*; *Rhynchosporium* species, for example *Rhynchosporium secalis*; *Septoria* species, for example *Septoria apii* or *Septoria lycopersici*; *Stagonospora* species, for example *Stagonospora nodorum*; *Typhula* species, for example *Typhula incarnata*; *Venturia* species, for example *Venturia inaequalis*;

root and stem diseases caused, for example, by *Corticium* species, for example *Corticium graminearum*; *Fusarium* species, for example *Fusarium oxysporum*; *Gaeumannomyces* species, for example *Gaeumannomyces graminis*; *Plasmodiophora* species, for example *Plasmodiophora brassicae*; *Rhizoctonia* species, for example *Rhizoctonia solani*; *Sarocladium* species, for example *Sarocladium oryzae*; *Sclerotium* species, for example *Sclerotium oryzae*; *Tapesia* species, for example *Tapesia acuformis*; *Thielaviopsis* species, for example *Thielaviopsis basicola*; *Ganoderma* species, for example *Ganoderma lucidum*;

ear and panicle diseases (including corn cobs) caused, for example, by *Alternaria* species, for example *Alternaria spp.*; *Aspergillus* species, for example *Aspergillus flavus*; *Cladosporium* species, for example *Cladosporium cladosporioides*; *Claviceps* species, for example *Claviceps purpurea*; *Fusarium* species,

for example *Fusarium culmorum*; *Gibberella* species, for example *Gibberella zeae*; *Monographella* species, for example *Monographella nivalis*; *Stagnospora* species, for example *Stagnospora nodorum*;

diseases caused by smut fungi, for example *Sphacelotheca* species, for example *Sphacelotheca reiliana*; *Tilletia* species, for example *Tilletia caries* or *Tilletia controversa*; *Urocystis* species, for example *Urocystis occulta*; *Ustilago* species, for example *Ustilago nuda*;

fruit rot caused, for example, by *Aspergillus* species, for example *Aspergillus flavus*; *Botrytis* species, for example *Botrytis cinerea*; *Penicillium* species, for example *Penicillium expansum* or *Penicillium purpurogenum*; *Rhizopus* species, for example *Rhizopus stolonifer*; *Sclerotinia* species, for example *Sclerotinia sclerotiorum*; *Verticilium* species, for example *Verticilium alboatrum*;

seed- and soil-borne rot and wilt diseases, and also diseases of seedlings, caused, for example, by *Alternaria* species, for example *Alternaria brassicicola*; *Aphanomyces* species, for example *Aphanomyces euteiches*; *Ascochyta* species, for example *Ascochyta lentis*; *Aspergillus* species, for example *Aspergillus flavus*; *Cladosporium* species, for example *Cladosporium herbarum*; *Cochliobolus* species, for example *Cochliobolus sativus* (conidial form: Drechslera, Bipolaris Syn: Helminthosporium); *Colletotrichum* species, for example *Colletotrichum coccodes*; *Fusarium* species, for example *Fusarium culmorum*; *Gibberella* species, for example *Gibberella zeae*; *Macrophomina* species, for example *Macrophomina phaseolina*; *Microdochium* species, for example *Microdochium nivale*; *Monographella* species, for example *Monographella nivalis*; *Penicillium* species, for example *Penicillium expansum*; *Phoma* species, for example *Phoma lingam*; *Phomopsis* species, for example *Phomopsis sojae*; *Phytophthora* species, for example *Phytophthora cactorum*; *Pyrenophora* species, for example *Pyrenophora graminea*; *Pyricularia* species, for example *Pyricularia oryzae*; *Pythium* species, for example *Pythium ultimum*; *Rhizoctonia* species, for example *Rhizoctonia solani*; *Rhizopus* species, for example *Rhizopus oryzae*; *Sclerotium* species, for example *Sclerotium rolfsii*; *Septoria* species, for example *Septoria nodorum*; *Typhula* species, for example *Typhula incarnata*; *Verticillium* species, for example *Verticillium dahliae*;

cancers, galls and witches' broom caused, for example, by *Nectria* species, for example *Nectria galligena*;

wilt diseases caused, for example, by *Monilinia* species, for example *Monilinia laxa*;

deformations of leaves, flowers and fruits caused, for example, by *Exobasidium* species, for example *Exobasidium vexans*; *Taphrina* species, for example *Taphrina deformans*;

degenerative diseases in woody plants, caused, for example, by *Esca* species, for example *Phaeomoniella chlamydospora*, *Phaeoacremonium aleophilum* or *Fomitiporia mediterranea*; *Ganoderma* species, for example *Ganoderma boninense*;

diseases of flowers and seeds caused, for example, by Botrytis species, for example *Botrytis cinerea*;

diseases of plant tubers caused, for example, by *Rhizoctonia* species, for example *Rhizoctonia solani*; *Helminthosporium* species, for example *Helminthosporium solani*;

diseases caused by bacterial pathogens, for example *Xanthomonas* species, for example *Xanthomonas campestris pv. oryzae*; *Pseudomonas* species, for example *Pseudomonas syringae pv. lachrymans*; *Erwinia* species, for example *Erwinia amylovora*; *Ralstonia* species, for example *Ralstonia solanacearum*;

Fungal diseases on roots and the stem base caused, for example, by black root rot (*Calonectria crotalariae*), charcoal rot (*Macrophomina phaseolina*), fusarium blight or wilt, root rot, and pod and collar rot (*Fusarium oxysporum, Fusarium orthoceras, Fusarium semitectum, Fusarium equiseti*), mycoleptodiscus root rot (*Mycoleptodiscus terrestris*), neocosmospora (*Neocosmospora vasinfecta*), pod and stem blight (*Diaporthe phaseolorum*), stem canker (*Diaporthe phaseolorum var. caulivora*), phytophthora rot (*Phytophthora megasperma*), brown stem rot (*Phialophora gregata*), pythium rot (*Pythium aphanidermatum, Pythium irregulare, Pythium debaryanum, Pythium myriotylum, Pythium ultimum*), rhizoctonia root rot, stem decay, and damping-off (*Rhizoctonia solani*), sclerotinia stem decay (*Sclerotinia sclerotiorum*), sclerotinia southern blight (*Sclerotinia rolfsii*), thielaviopsis root rot (*Thielaviopsis basicola*).

Plants which can be treated in accordance with the invention include the following: *Rosaceae sp* (for example pome fruits such as apples, pears, apricots, cherries, almonds and peaches), *Ribesioidae sp.*, *Juglandaceae sp.*, *Betulaceae sp.*, *Anacardiaceae sp.*, *Fagaceae sp.*, *Moraceae sp.*, *Oleaceae sp.*, *Actinidaceae sp.*, *Lauraceae sp.*, *Musaceae sp.* (for example banana trees and plantations), *Rubiaceae sp.* (for example coffee), *Theaceae sp.*, *Sterculiceae sp.*, *Rutaceae sp.* (for example lemons, oranges and grapefruit); *Vitaceae sp.* (for example grapes); *Solanaceae sp.* (for example tomatoes, peppers), *Liliaceae sp.*, *Asteraceae sp.* (for example lettuce), *Umbelliferae sp.*, *Cruciferae sp.*, *Chenopodiaceae sp.*, *Cucurbitaceae sp.* (for example cucumber), *Alliaceae sp.* (for example leek, onion), *Papilionaceae sp.* (for example peas); major crop plants, such as *Poaceae/Gramineae sp.* (for example maize, turf, cereals such as wheat, rye, rice, barley, oats, millet and triticale), *Asteraceae sp.* (for example sunflower), *Brassicaceae sp.* (for example white cabbage, red cabbage, broccoli, cauliflower, Brussels sprouts, pak choi, kohlrabi, radishes, and oilseed rape, mustard, horseradish and cress), *Fabacae sp.* (for example bean, peanuts), *Papilionaceae sp.* (for example soya bean), *Solanaceae sp.*

(for example potatoes), *Chenopodiaceae sp.* (for example sugar beet, fodder beet, swiss chard, beetroot); Malvaceae (for example cotton); useful plants and ornamental plants for gardens and wooded areas; and genetically modified varieties of each of these plants.

More preference is given to controlling the following diseases of soya beans: Fungal diseases on leaves, stems, pods and seeds caused, for example, by Altemaria leaf spot (*Altemaria spec. atrans tenuissima*), Anthracnose (*Colletotrichum gloeosporoides dematium var. truncatum*), brown spot (*Septoria glycines*), cercospora leaf spot and blight (*Cercospora kikuchii*), choanephora leaf blight (*Choanephora infundibulifera trispora (Syn.)*), dactuliophora leaf spot (*Dactuliophora glycines*), downy mildew (*Peronospora manshurica*), drechslera blight (*Drechslera glycini*), frogeye leaf spot (*Cercospora sojina*), leptosphaerulina leaf spot (*Leptosphaerulina trifolii*), phyllostica leaf spot (*Phyllosticta sojaecola*), pod and stem blight (*Phomopsis sojae*), powdery mildew (*Microsphaera diffusa*), pyrenochaeta leaf spot (*Pyrenochaeta glycines*), rhizoctonia aerial, foliage, and web blight (*Rhizoctonia solani*), rust (*Phakopsora pachyrhizi, Phakopsora meibomiae*), scab (*Sphaceloma glycines*), stemphylium leaf blight (*Stemphylium botryosum*), target spot (*Corynespora cassiicola*).

The present invention also relates to the use of compounds of formula I, the combinations or the compositions thereof for controlling or preventing the following plant diseases: *Puccinia spp.* (rusts) on various plants, for example, but not limited to *P. triticina* (brown or leaf rust), *P. striiformis* (stripe or yellow rust*), Puccinia melanocephala (sugarcane rust), P. hordei* (dwarf rust), *P. graminis* (stem or black rust) or *P. recondita* (brown or leaf rust) on cereals, such as e. g. wheat, barley or rye and *Phakopsoraceae spp.* on various plants, in particular *Phakopsora pachyrhizi and P. meibomiae* (soybean rust) on soybeans, *Hemileia vastatrix* (Coffee rust), *Uromyces appendiculatus, Uromyces fabae and Uromyces phaseoli* (rust of beans).

The present invention further relates to the use of compounds of formula I, the combinations or the compositions thereof for controlling or preventing against phytopathogenic fungi such as *Phakopsora pachyrhizi, Phakopsora meibomiae*, of agricultural crops and or horticultural crops.

All plants and plant parts can be treated in accordance with the invention. Plants are understood here to mean all plants and plant populations, such as desired and undesired wild plants or crop plants (including naturally occurring crop plants). Crop plants may be plants which can be obtained by conventional breeding and optimization methods or by biotechnological and genetic engineering methods or combinations of these methods, including the transgenic plants and including the plant cultivars which are protectable and non-protectable by plant breeders' rights. Plant parts are understood to mean all parts and organs of plants above and below the ground, such as shoot, leaf, flower and root, examples of which

include leaves, needles, stalks, stems, flowers, fruit bodies, fruits and seeds, and also roots, tubers and rhizomes. The plant parts also include harvested material and vegetative and generative propagation material, for example cuttings, tubers, rhizomes, slips and seeds.

The invention furthermore includes a method for treating seed, particularly seeds (dormant, primed, pregerminated or even with emerged roots and leaves) treated with at least one of the compounds of the formula (I) and compositions thereof. The inventive seeds are used in methods for protection of seeds and emerged plants from the seeds from phytopathogenic harmful fungi. In these methods, seed treated with at least one inventive active ingredient is used.

It is also desirable to optimize the amount of the active ingredient used so as to provide the best possible protection for the seeds, the germinating plants and emerged seedlings from attack by phytopathogenic fungi, but without damaging the plants themselves by the active ingredient used. In particular, methods for the treatment of seed should also take into consideration the intrinsic phenotypes of transgenic plants in order to achieve optimum protection of the seed and the germinating plant with a minimum of crop protection compositions being employed.

The present invention therefore also relates to a method for protecting seeds, germinating plants and emerged seedlings against attack by animal pests and/or phytopathogenic harmful microorganisms by treating the seeds with an inventive composition. The invention also relates to the use of the compositions according to the invention for treating seeds for protecting the seeds, the germinating plants and emerged seedlings against animal pests and/or phytopathogenic microorganisms. The invention further relates to seeds which have been treated with an inventive composition for protection from animal pests and/or phytopathogenic microorganisms.

One of the advantages of the present invention is that the treatment of the seeds with these compositions not only protects the seed itself, but also the resulting plants after emergence, from animal pests and/or phytopathogenic harmful microorganisms. In this way, the immediate treatment of the crop at the time of sowing or shortly thereafter protect plants as well as seed treatment in prior to sowing. It is likewise considered to be advantageous that the inventive active ingredients or compositions can be used especially also for transgenic seed, in which case the plant which grows from this seed is capable of expressing a protein which acts against pests, herbicidal damage or abiotic stress. The treatment of such seeds with the inventive active ingredients or compositions, for example an insecticidal protein, can result in control of certain pests. Surprisingly, a further synergistic effect can be observed in this case, which

additionally increases the effectiveness for protection against attack by pests, microorganisms, weeds or abiotic stress.

The compounds of the formula (I) are suitable for protection of seed of any plant variety which is used in agriculture, in the greenhouse, in forests or in horticulture. More particularly, the seed is that of cereals (such as wheat, barley, rye, millet and oats), oilseed rape, maize, cotton, soybeen, rice, potatoes, sunflower, beans, coffee, beet (e.g. sugar beet and fodder beet), peanut, vegetables (such as tomato, cucumber, onions and lettuce), lawns and ornamental plants. Of particular significance is the treatment of the seed of wheat, soybean, oilseed rape, maize and rice.

As also described below, the treatment of transgenic seed with the inventive active ingredients or compositions is of particular significance. This refers to the seed of plants containing at least one heterologous gene which allows the expression of a polypeptide or protein, e.g. having insecticidal properties. These heterologous genes in transgenic seeds may originate, for example, from microorganisms of the species *Bacillus, Rhizobium, Pseudomonas, Serratia, Trichoderma, Clavibacter, Glomus* or *Gliocladium*. These heterologous genes preferably originate from *Bacillus sp.*, in which case the gene product is effective against the European corn borer and/or the Western corn rootworm. Particularly preferably, the heterologous genes originate from *Bacillus thuringiensis*.

In the context of the present invention, the inventive composition is applied to seeds either alone or in a suitable formulation. Preferably, the seed is treated in a state in which it is sufficiently stable for no damage to occur in the course of treatment. In general, seeds can be treated at any time between harvest and some time after sowing. It is customary to use seed which has been separated from the plant and freed from cobs, shells, stalks, coats, hairs or the flesh of the fruits. For example, it is possible to use seed which has been harvested, cleaned and dried down to a moisture content of less than 15% by weight. Alternatively, it is also possible to use seed which, after drying, for example, has been treated with water and then dried again, or seeds just after priming, or seeds stored in primed conditions or pre-germinated seeds, or seeds sown on nursery trays, tapes or paper.

When treating the seeds, it generally has to be ensured that the amount of the inventive composition applied to the seed and/or the amount of further additives is selected such that the germination of the seed is not impaired, or that the resulting plant is not damaged. This must be ensured particularly in the case of active ingredients which can exhibit phytotoxic effects at certain application rates.

The compounds of the formula (I) can be applied directly, i.e. without containing any other components and without having been diluted. In general, it is preferable to apply the compositions to the seed in the

form of a suitable formulation. Suitable formulations and methods for seed treatment are known to those skilled in the art. The compounds of the formula (I) can be converted to the customary formulations relevant to on-seed applications, such as solutions, emulsions, suspensions, powders, foams, slurries or combined with other coating compositions for seed, such as film forming materials, pelleting materials, fine iron or other metal powders, granules, coating material for inactivated seeds, and also ULV formulations.

In the treatment of seeds to facilitate plantability seeds can be coated with polymer. The polymer coating is comprised of a binder, a wax and a pigment, and one or more stabilizers in an amount effective to stabilize the suspension. The binder can be a polymer selected from the group consisting of vinyl acetate-ethylene copolymer, vinyl acetate homopolymer, vinyl acetate-acrylic copolymer, vinylacrylic, acrylic, ethylene-vinyl chloride, vinyl ether maleic anhydride, or butadiene styrene. Other similar polymers can be used.

These formulations are prepared in a known manner, by mixing the active ingredients or active ingredient combinations with customary additives, for example customary extenders and solvents or diluents, dyes, wetting agents, dispersants, emulsifiers, antifoams, preservatives, secondary thickeners, adhesives, gibberellins, and also water.

Useful dyes which may be present in the seed dressing formulations usable in accordance with the invention are all dyes which are customary for such purposes. It is possible to use either pigments, which are sparingly soluble in water, or dyes, which are soluble in water. Examples include the dyes known by the names Rhodamine B, C.I. Pigment Red 112 and C.I. Solvent Red 1.

Useful wetting agents which may be present in the seed dressing formulations usable in accordance with the invention are all substances which promote wetting and which are conventionally used for the formulation of active agrochemical ingredients. Usable with preference are alkylnaphthalenesulphonates, such as diisopropyl- or diisobutylnaphthalenesulphonates.

Useful dispersants and/or emulsifiers which may be present in the seed dressing formulations usable in accordance with the invention are all nonionic, anionic and cationic dispersants conventionally used for the formulation of active agrochemical ingredients. Usable with preference are nonionic or anionic dispersants or mixtures of nonionic or anionic dispersants. Useful nonionic dispersants include especially ethylene oxide/propylene oxide block polymers, alkylphenol polyglycol ethers and tristryrylphenol polyglycol ether, and the phosphated or sulphated derivatives thereof. Suitable anionic dispersants are especially lignosulphonates, polyacrylic acid salts and arylsulphonate/formaldehyde condensates.

Antifoams which may be present in the seed dressing formulations usable in accordance with the invention are all foam-inhibiting substances conventionally used for the formulation of active agrochemical ingredients. Silicone antifoams and magnesium stearate can be used with preference.

Preservatives which may be present in the seed dressing formulations usable in accordance with the invention are all substances usable for such purposes in agrochemical compositions. Examples include dichlorophene and benzyl alcohol hemiformal.

Secondary thickeners which may be present in the seed dressing formulations usable in accordance with the invention are all substances usable for such purposes in agrochemical compositions. Preferred examples include cellulose derivatives, acrylic acid derivatives, xanthan, modified clays and finely divided silica.

Adhesives which may be present in the seed dressing formulations usable in accordance with the invention are all customary binders usable in seed dressing products. Preferred examples include polyvinylpyrrolidone, polyvinyl acetate, polyvinyl alcohol and tylose.

The formulations for on-seed applications usable in accordance with the invention can be used to treat a wide variety of different kinds of seed either directly or after prior dilution with water. For instance, the concentrates or the preparations obtainable therefrom by dilution with water can be used to dress the seed of cereals, such as wheat, barley, rye, oats, and triticale, and also seeds of maize, soybean, rice, oilseed rape, peas, beans, cotton, sunflowers, and beets, or else a wide variety of different vegetable seeds. The formulations usable in accordance with the invention, or the dilute preparations thereof, can also be used for seeds of transgenic plants. In this case, additional synergistic effects may also occur in interaction with the substances formed by expression.

For treatment of seeds with the formulations usable in accordance with the invention, or the preparations prepared therefrom by adding water, all mixing units usable customarily for on-seed applications are useful. Specifically, the procedure in on-seed applications is to place the seeds into a mixer, to add the particular desired amount of the formulations, either as such or after prior dilution with water, and to mix everything until all applied formulations are distributed homogeneously on the seeds. If appropriate, this is followed by a drying operation.

The compounds of the invention and compositions thereof are also suitable for the protection of plant propagation material, for example seeds, such as fruit, tubers or kernels, or nursery plants, against pests of the abovementioned type. The propagation material can be treated with the compound prior to

planting, for example seed can be treated prior to sowing. Alternatively, the compound can be applied to seed kernels (coating), either by soaking the kernels in a liquid composition or by applying a layer of a solid composition. It is also possible to apply the compositions when the propagation material is planted to the site of application, for example into the seed furrow during drilling. These treatment methods for plant propagation material and the plant propagation material thus treated are further subjects of the invention. Typical treatment rates would depend on the plant and pest/fungi to be controlled and are generally between 1 to 200 grams per 100 kg of seeds, preferably between 5 to 150 grams per 100 kg of seeds, such as between 10 to 100 grams per 100 kg of seeds. The application of the compounds of the present invention to seeds is a preferred application method.

The application rate of the formulations usable in accordance with the invention can be varied within a relatively wide range. It is guided by the particular content of the active ingredients in the formulations and by the seeds. The application rates of each single active ingredient are generally between 0.001 and 15 g per kilogram of seed, preferably between 0.01 and 5 g per kilogram of seed.

When using the compounds of the formula (I) as fungicides, the application rates can be varied within a relatively wide range, depending on the kind of application. The application rate of the inventive active ingredients is:

in the case of treatment of plant parts, for example leaves: from 0.1 to 10000 g/ha, preferably from 10 to 1000 g/ha, more preferably from 30 to 300 g/ha (in the case of application by watering or dripping, it is even possible to reduce the application rate, especially when inert substrates such as rockwool or perlite are used);

in the case of seed treatment: from 0.1 to 200 g per 100 kg of seed, preferably from 1 to 150 g per 100 kg of seed, more preferably from 2.5 to 25 g per 100 kg of seed, even more preferably from 2.5 to 12.5 g per 100 kg of seed;

in the case of soil treatment: from 0.1 to 10000 g/ha, preferably from 1 to 5000 g/ha.

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

In some cases, the compounds of the formula (I) can, at particular concentrations or application rates, also be used as herbicides, safeners, growth regulators or agents to improve plant properties, or as microbicides, for example as fungicides, antimycotics, bactericides, viricides (including compositions

against viroids) or as compositions against MLO (Mycoplasma-like organisms) and RLO (Rickettsia-like organisms).

The compounds of the formula (I) intervene in physiological processes of plants and can therefore also be used as plant growth regulators. Plant growth regulators may exert various effects on plants. The effect of the substances depends essentially on the time of application in relation to the developmental stage of the plant, the plant variety and also on the amounts of active ingredient applied to the plants or their environment and on the type of application. In each case, growth regulators should have a particular desired effect on the crop plants.

Growth regulating effects, comprise earlier germination, better emergence, more developed root system and/or improved root growth, increased ability of tillering, more productive tillers, earlier flowering, increased plant height and/or biomass, shorting of stems, improvements in shoot growth, number of kernels/ear, number of ears/m^2, number of stolons and/or number of flowers, enhanced harvest index, bigger leaves, less dead basal leaves, improved phyllotaxy, earlier maturation/ earlier fruit finish, homogenous riping, increased duration of grain filling, better fruit finish, bigger fruit/vegetable size, sprouting resistance and reduced lodging.

Increased or improved yield is referring to total biomass per hectare, yield per hectare, kernel/fruit weight, seed size and/or hectolitre weight as well as to improved product quality, comprising:

improved processability relating to size distribution (kernel, fruit, etc.), homogenous riping, grain moisture, better milling, better vinification, better brewing, increased juice yield, harvestability, digestibility, sedimentation value, falling number, pod stability, storage stability, improved fiber length/strength/uniformity, increase of milk and/or meet quality of silage fed animals, adaption to cooking and frying;

further comprising improved marketability relating to improved fruit/grain quality, size distribution (kernel, fruit, etc.), increased storage/shelf-life, firmness /softness, taste (aroma, texture, etc.), grade (size, shape, number of berries, etc.), number of berries/fruits per bunch, crispness, freshness, coverage with wax, frequency of physiological disorders, colour, etc.;

further comprising increased desired ingredients such as e.g. protein content, fatty acids, oil content, oil quality, aminoacid composition, sugar content, acid content (pH), sugar/acid ratio (Brix), polyphenols, starch content, nutritional quality, gluten content/index, energy content, taste, etc.;

and further comprising decreased undesired ingredients such as e.g. less mycotoxines, less aflatoxines, geosmin level, phenolic aromas, lacchase, polyphenol oxidases and peroxidases, nitrate content etc.

Plant growth-regulating compounds can be used, for example, to slow down the vegetative growth of the plants. Such growth depression is of economic interest, for example, in the case of grasses, since it is thus possible to reduce the frequency of grass cutting in ornamental gardens, parks and sport facilities, on roadsides, at airports or in fruit crops. Also of significance is the inhibition of the growth of herbaceous and woody plants on roadsides and in the vicinity of pipelines or overhead cables, or quite generally in areas where vigorous plant growth is unwanted.

Also important is the use of growth regulators for inhibition of the longitudinal growth of cereal. This reduces or completely eliminates the risk of lodging of the plants prior to harvest. In addition, growth regulators in the case of cereals can strengthen the culm, which also counteracts lodging. The employment of growth regulators for shortening and strengthening culms allows the deployment of higher fertilizer volumes to increase the yield, without any risk of lodging of the cereal crop.

In many crop plants, vegetative growth depression allows denser planting, and it is thus possible to achieve higher yields based on the soil surface. Another advantage of the smaller plants obtained in this way is that the crop is easier to cultivate and harvest.

Reduction of the vegetative plant growth may also lead to increased or improved yields because the nutrients and assimilates are of more benefit to flower and fruit formation than to the vegetative parts of the plants.

Alternatively, growth regulators can also be used to promote vegetative growth. This is of great benefit when harvesting the vegetative plant parts. However, promoting vegetative growth may also promote generative growth in that more assimilates are formed, resulting in more or larger fruits.

Furthermore, beneficial effects on growth or yield can be achieved through improved nutrient use efficiency, especially nitrogen (N)-use efficiency, phosphours (P)-use efficiency, water use efficiency, improved transpiration, respiration and/or CO_2 assimilation rate, better nodulation, improved Ca-metabolism etc.

Likewise, growth regulators can be used to alter the composition of the plants, which in turn may result in an improvement in quality of the harvested products. Under the influence of growth regulators, parthenocarpic fruits may be formed. In addition, it is possible to influence the sex of the flowers. It is

also possible to produce sterile pollen, which is of great importance in the breeding and production of hybrid seed.

Use of growth regulators can control the branching of the plants. On the one hand, by breaking apical dominance, it is possible to promote the development of side shoots, which may be highly desirable particularly in the cultivation of ornamental plants, also in combination with an inhibition of growth. On the other hand, however, it is also possible to inhibit the growth of the side shoots. This effect is of particular interest, for example, in the cultivation of tobacco or in the cultivation of tomatoes.

Under the influence of growth regulators, the amount of leaves on the plants can be controlled such that defoliation of the plants is achieved at a desired time. Such defoliation plays a major role in the mechanical harvesting of cotton, but is also of interest for facilitating harvesting in other crops, for example in viticulture. Defoliation of the plants can also be undertaken to lower the transpiration of the plants before they are transplanted.

Furthermore, growth regulators can modulate plant senescence, which may result in prolonged green leaf area duration, a longer grain filling phase, improved yield quality, etc.

Growth regulators can likewise be used to regulate fruit dehiscence. On the one hand, it is possible to prevent premature fruit dehiscence. On the other hand, it is also possible to promote fruit dehiscence or even flower abortion to achieve a desired mass ("thinning"). In addition, it is possible to use growth regulators at the time of harvest to reduce the forces required to detach the fruits, in order to allow mechanical harvesting or to facilitate manual harvesting.

Growth regulators can also be used to achieve faster or else delayed ripening of the harvested material before or after harvest. This is particularly advantageous as it allows optimal adjustment to the requirements of the market. Moreover, growth regulators in some cases can improve the fruit colour. In addition, growth regulators can also be used to synchronize maturation within a certain period of time. This establishes the prerequisites for complete mechanical or manual harvesting in a single operation, for example in the case of tobacco, tomatoes or coffee.

By using growth regulators, it is additionally possible to influence the resting of seed or buds of the plants, such that plants such as pineapple or ornamental plants in nurseries, for example, germinate, sprout or flower at a time when they are normally not inclined to do so. In areas where there is a risk of frost, it may be desirable to delay budding or germination of seeds with the aid of growth regulators, in order to avoid damage resulting from late frosts.

Finally, growth regulators can induce resistance of the plants to frost, drought or high salinity of the soil. This allows the cultivation of plants in regions which are normally unsuitable for this purpose.

The compounds of the formula (I) also exhibit a potent strengthening effect in plants. Accordingly, they can be used for mobilizing the defences of the plant against attack by undesirable microorganisms.

Plant-strengthening (resistance-inducing) substances in the present context are substances capable of stimulating the defence system of plants in such a way that the treated plants, when subsequently inoculated with undesirable microorganisms, develop a high degree of resistance to these microorganisms.

Further, in context with the present invention plant physiology effects comprise the following:

Abiotic stress tolerance, comprising tolerance to high or low temperatures, drought tolerance and recovery after drought stress, water use efficiency (correlating to reduced water consumption), flood tolerance, ozone stress and UV tolerance, tolerance towards chemicals like heavy metals, salts, pesticides etc.

Biotic stress tolerance comprising increased fungal resistance and increased resistance against nematodes, viruses and bacteria. In context with the present invention, biotic stress tolerance preferably comprises increased fungal resistance and increased resistance against nematodes.

Increased plant vigor, comprising plant health / plant quality and seed vigor, reduced stand failure, improved appearance, increased recovery after periods of stress, improved pigmentation (e.g. chlorophyll content, stay-green effects, etc.) and improved photosynthetic efficiency.

In addition, the compounds of the formula (I) can reduce the mycotoxin content in the harvested material and the foods and feeds prepared therefrom. Mycotoxins include particularly, but not exclusively, the following: deoxynivalenol (DON), nivalenol, 15-Ac-DON, 3-Ac-DON, T2- and HT2-toxin, fumonisins, zearalenon, moniliformin, fusarin, diaceotoxyscirpenol (DAS), beauvericin, enniatin, fusaroproliferin, fusarenol, ochratoxins, patulin, ergot alkaloids and aflatoxins which can be produced, for example, by the following fungi: *Fusarium* spec., such as *F. acuminatum*, *F. asiaticum*, *F. avenaceum*, *F. crookwellense*, *F. culmorum*, *F. graminearum* (*Gibberella zeae*), *F. equiseti*, *F. fujikoroi*, *F. musarum*, *F. oxysporum*, *F. proliferatum*, *F. poae*, *F. pseudograminearum*, *F. sambucinum*, *F. scirpi*, *F. semitectum*, *F. solani*, *F. sporotrichoides*, *F. langsethiae*, *F. subglutinans*, *F. tricinctum*, *F. verticillioides* etc., and also by *Aspergillus* spec., such as *A. flavus*, *A. parasiticus*, *A. nomius*, *A. ochraceus*, *A. clavatus*, *A. terreus*, *A. versicolor*, *Penicillium* spec., such as *P. verrucosum*, *P. viridicatum*, *P. citrinum*, *P. expansum*, *P.*

claviforme, *P. roqueforti*, *Claviceps* spec., such as *C. purpurea*, *C. fusiformis*, *C. paspali*, *C. africana*, *Stachybotrys* spec. and others.

The compounds of the formula (I) can also be used in the protection of materials, for protection of industrial materials against attack and destruction by phytopathogenic fungi.

In addition, the compounds of the formula (I) can be used as antifouling compositions, alone or in combinations with other active ingredients.

Industrial materials in the present context are understood to mean inanimate materials which have been prepared for use in industry. For example, industrial materials which are to be protected by inventive compositions from microbial alteration or destruction may be adhesives, glues, paper, wallpaper and board/cardboard, textiles, carpets, leather, wood, fibers and tissues, paints and plastic articles, cooling lubricants and other materials which can be infected with or destroyed by microorganisms. Parts of production plants and buildings, for example cooling-water circuits, cooling and heating systems and ventilation and air-conditioning units, which may be impaired by the proliferation of microorganisms may also be mentioned within the scope of the materials to be protected. Industrial materials within the scope of the present invention preferably include adhesives, sizes, paper and card, leather, wood, paints, cooling lubricants and heat transfer fluids, more preferably wood.

The compounds of the formula (I) may prevent adverse effects, such as rotting, decay, discoloration, decoloration or formation of mould.

In the case of treatment of wood the compounds of the formula (I) may also be used against fungal diseases liable to grow 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 a composition according to the invention; this includes for example direct application, spraying, dipping, injection or any other suitable means.

In addition, the compounds of the formula (I) can be used to protect objects which come into contact with saltwater or brackish water, especially hulls, screens, nets, buildings, moorings and signalling systems, from fouling.

The compounds of the formula (I) can also be employed for protecting storage goods. Storage goods are understood to mean natural substances of vegetable or animal origin or processed products thereof which are of natural origin, and for which long-term protection is desired.

Storage goods of vegetable origin, for example plants or plant parts, such as stems, leaves, tubers, seeds, fruits, grains, can be protected freshly harvested or after processing by (pre)drying, moistening, comminuting, grinding, pressing or roasting. Storage goods also include timber, both unprocessed, such as construction timber, electricity poles and barriers, or in the form of finished products, such as furniture. Storage goods of animal origin are, for example, hides, leather, furs and hairs. The inventive compositions may prevent adverse effects, such as rotting, decay, discoloration, decoloration or formation of mould.

Microorganisms capable of degrading or altering the industrial materials include, for example, bacteria, fungi, yeasts, algae and slime organisms. The compounds of the formula (I) preferably act against fungi, especially moulds, wood-discoloring and wood-destroying fungi (*Ascomycetes, Basidiomycetes*, *Deuteromycetes* and *Zygomycetes*), and against slime organisms and algae. Examples include microorganisms of the following genera: *Alternaria*, such as *Alternaria tenuis*; *Aspergillus*, such as *Aspergillus niger*; *Chaetomium*, such as *Chaetomium globosum*; *Coniophora*, such as *Coniophora puetana*; *Lentinus*, such as *Lentinus tigrinus*; *Penicillium*, such as *Penicillium glaucum*; *Polyporus*, such as *Polyporus versicolor*; *Aureobasidium*, such as *Aureobasidium pullulans*; *Sclerophoma*, such as *Sclerophoma pityophila*; *Trichoderma*, such as *Trichoderma viride*; *Ophiostoma spp.*, *Ceratocystis spp.*, *Humicola spp.*, *Petriella spp.*, *Trichurus spp.*, *Coriolus spp.*, *Gloeophyllum spp.*, *Pleurotus spp.*, *Poria spp.*, *Serpula spp.* and *Tyromyces spp.*, *Cladosporium spp.*, *Paecilomyces spp. Mucor spp.*, *Escherichia*, such as *Escherichia coli*; *Pseudomonas*, such as *Pseudomonas aeruginosa*; *Staphylococcus*, such as *Staphylococcus aureus*, *Candida spp.* and *Saccharomyces spp.*, such as *Saccharomyces cerevisae.*

In addition, the compounds of the formula (I) also have very good antimycotic effects. They have a very broad antimycotic activity spectrum, especially against dermatophytes and yeasts, moulds and diphasic fungi (for example against *Candida* species, such as *Candida albicans, Candida glabrata*), and *Epidermophyton floccosum, Aspergillus* species, such as *Aspergillus niger* and *Aspergillus fumigatus, Trichophyton* species, such as *Trichophyton mentagrophytes, Microsporon* species such as *Microsporon canis* and *audouinii*. The enumeration of these fungi by no means constitutes a restriction of the mycotic spectrum covered, and is merely of illustrative character.

The compounds can also be used to control important fungal pathogens in fish and crustacea farming, e.g. *saprolegnia diclina* in trouts, *saprolegnia parasitica* in crayfish.

The compounds of the formula (I) can therefore be used both in medical and non-medical applications.

The compounds of the formula (I) can be used as such, in the form of their formulations or the use forms prepared therefrom, such as ready-to-use solutions, suspensions, wettable powders, pastes, soluble

powders, dusts and granules. Application is accomplished in a customary manner, for example by watering, spraying, atomizing, broadcasting, dusting, foaming, spreading-on and the like. It is also possible to deploy the active ingredients by the ultra-low volume method or to inject the active ingredient preparation/the active ingredient itself into the soil. It is also possible to treat the seed of the plants.

It is possible to treat all plants and their parts in accordance with the invention, preferably with wild plant species and plant cultivars, or those obtained by conventional biological breeding methods, such as crossing or protoplast fusion, and also parts thereof. In a further preferred embodiment, transgenic plants and plant cultivars obtained by genetic engineering methods, if appropriate in combination with conventional methods (Genetically Modified Organisms), and parts thereof are treated. The terms "parts" or "parts of plants" or "plant parts" have been explained above. More preferably, plants of the plant cultivars which are commercially available or are in use are treated in accordance with the invention. Plant cultivars are understood to mean plants which have new properties ("traits") and have been obtained by conventional breeding, by mutagenesis or by recombinant DNA techniques. They can be cultivars, varieties, bio- or genotypes.

The method of treatment according to the invention can be used in the treatment of genetically modified organisms (GMOs), e.g. plants or seeds. Genetically modified plants (or transgenic plants) are plants of which a heterologous gene has been stably integrated into genome. The expression "heterologous gene" essentially means a gene which is provided or assembled outside the plant and when introduced in the nuclear, chloroplastic or mitochondrial genome gives the transformed plant new or improved agronomic or other properties by expressing a protein or polypeptide of interest or by downregulating or silencing other gene(s) which are present in the plant (using for example, antisense technology, cosuppression technology, RNA interference – RNAi – technology or microRNA – miRNA - technology). A heterologous gene that is located in the genome is also called a transgene. A transgene that is defined by its particular location in the plant genome is called a transformation or transgenic event.

Plants and plant cultivars which are preferably to be treated according to the invention include all plants which have genetic material which impart particularly advantageous, useful traits to these plants (whether obtained by breeding and/or biotechnological means).

Plants and plant cultivars which are also preferably to be treated according to the invention are resistant against one or more biotic stresses, i.e. said plants show a better defense against animal and microbial pests, such as against nematodes, insects, mites, phytopathogenic fungi, bacteria, viruses and/or viroids.

Plants and plant cultivars which may also be treated according to the invention are those plants which are resistant to one or more abiotic stresses. Abiotic stress conditions may include, for example, drought, cold

temperature exposure, heat exposure, osmotic stress, flooding, increased soil salinity, increased mineral exposure, ozone exposure, high light exposure, limited availability of nitrogen nutrients, limited availability of phosphorus nutrients, shade avoidance.

Plants and plant cultivars which may also be treated according to the invention, are those plants characterized by enhanced yield characteristics. Increased yield in said plants can be the result of, for example, improved plant physiology, growth and development, such as water use efficiency, water retention efficiency, improved nitrogen use, enhanced carbon assimilation, improved photosynthesis, increased germination efficiency and accelerated maturation. Yield can furthermore be affected by improved plant architecture (under stress and non-stress conditions), including but not limited to, early flowering, flowering control for hybrid seed production, seedling vigor, plant size, internode number and distance, root growth, seed size, fruit size, pod size, pod or ear number, seed number per pod or ear, seed mass, enhanced seed filling, reduced seed dispersal, reduced pod dehiscence and lodging resistance. Further yield traits include seed composition, such as carbohydrate content and composition for example cotton or starch, protein content, oil content and composition, nutritional value, reduction in anti-nutritional compounds, improved processability and better storage stability.

Plants that may be treated according to the invention are hybrid plants that already express the characteristic of heterosis or hybrid vigor which results in generally higher yield, vigor, health and resistance towards biotic and abiotic stresses).

Plants or plant cultivars (obtained by plant biotechnology methods such as genetic engineering) which may be treated according to the invention are herbicide-tolerant plants, i.e. plants made tolerant to one or more given herbicides. Such plants can be obtained either by genetic transformation, or by selection of plants containing a mutation imparting such herbicide tolerance.

Plants or plant cultivars (obtained by plant biotechnology methods such as genetic engineering) which may also be treated according to the invention are insect-resistant transgenic plants, i.e. plants made resistant to attack by certain target insects. Such plants can be obtained by genetic transformation, or by selection of plants containing a mutation imparting such insect resistance.

Plants or plant cultivars (obtained by plant biotechnology methods such as genetic engineering) which may also be treated according to the invention are tolerant to abiotic stresses. Such plants can be obtained by genetic transformation, or by selection of plants containing a mutation imparting such stress resistance.

Plants or plant cultivars (obtained by plant biotechnology methods such as genetic engineering) which may also be treated according to the invention show altered quantity, quality and/or storage-stability of the harvested product and/or altered properties of specific ingredients of the harvested product.

Plants or plant cultivars (that can be obtained by plant biotechnology methods such as genetic engineering) which may also be treated according to the invention are plants, such as cotton plants, with altered fiber characteristics. Such plants can be obtained by genetic transformation, or by selection of plants contain a mutation imparting such altered fiber characteristics.

Plants or plant cultivars (that can be obtained by plant biotechnology methods such as genetic engineering) which may also be treated according to the invention are plants, such as oilseed rape or related Brassica plants, with altered oil profile characteristics. Such plants can be obtained by genetic transformation, or by selection of plants contain a mutation imparting such altered oil profile characteristics.

Plants or plant cultivars (that can be obtained by plant biotechnology methods such as genetic engineering) which may also be treated according to the invention are plants, such as oilseed rape or related Brassica plants, with altered seed shattering characteristics. Such plants can be obtained by genetic transformation, or by selection of plants contain a mutation imparting such altered seed shattering characteristics and include plants such as oilseed rape plants with delayed or reduced seed shattering.

Plants or plant cultivars (that can be obtained by plant biotechnology methods such as genetic engeenering) which may also be treated according to the invention are plants, such as tobacco plants, with altered post-translational protein modification patterns.

The compounds of the present invention not only control undesired phytopathogenic microorganisms effectively but also show positive crop response such as plant growth enhancement effects like enhanced crop vigor, enhanced root growth, enhanced tolerant to drought, high salt, high temperature, chill, frost or light radiation, improved flowering, efficient water and nutrient utilization (such as improved nitrogen assimilation), enhanced quality plant product, more number of productive tillers, enhanced resistance to fungi, insects, pests and the like, which results in higher yields.

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 a person 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 a person ordinary skilled in the art.

Any of the compounds according to the invention, can also exist in one or more amorphic or isomorphic or polymorphic forms, depending on their preparation, purification storage and various other influencing factors. The invention thus relates all the possible amorphic, isomorphic and polymorphic forms, in all proportions. The amorphic, isomorphic and polymorphic forms can be prepared and/or separated and/or purified according to general methods, which are known per se by a person ordinary skilled in the art.

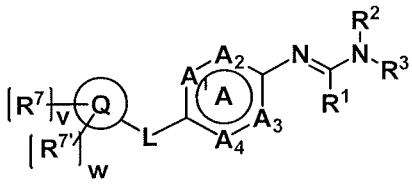
There are a large number of suitable known standard methods, such as alkylation, halogenation, acylation, amidation, oximation, oxidation and reduction. The choice of the preparation methods which are suitable are depending on the properties (reactivity) of the substituents in the intermediates. These reactions can be conveniently performed in a solvent. These reactions can be conveniently performed at various temperatures. These reactions can be conveniently performed in an inert atmosphere. The reactants can be reacted in the presence of a base.

The reactants can be reacted with each other as such, i.e. without adding a solvent or diluent. In most cases, however, it is advantageous to add an inert solvent or diluent or a mixture of these. If the reaction is carried out in the presence of a base, bases which are employed in excess, such as triethylamine, pyridine, N-methylmorpholine or N,N-diethylaniline, may also act as solvents or diluents. The reaction is advantageously carried out in a temperature range from approximately -80°C to approximately +140°C, preferably from approximately -30°C to approximately +100°C, in many cases in the range between ambient temperature and approximately +80°C.

A compound of formula (I) can be converted in a manner known per se into another compound of formula (I) by replacing one or more substituents of the starting compound of formula (I) in the customary manner by (an)other substituent(s) according to the invention. Depending on the choice of the reaction conditions and starting materials which are suitable in each case, it is possible, for example, in one reaction step only to replace one substituent by another substituent according to the invention, or a plurality of substituents can be replaced by other substituents according to the invention in the same reaction step. Salts of compounds of formula (I) can be prepared in a manner known per se. Thus, for example, acid addition

salts of compounds of formula (I) are obtained by treatment with a suitable acid or a suitable ion exchanger reagent and salts with bases are obtained by treatment with a suitable base or with a suitable ion exchanger reagent. A salt is chosen depending on its tolerances for compound's use, such as agricultural or physiological tolerance. Salts of compounds of formula (I) can be converted in the customary manner into the free compounds I, acid addition salts, for example, by treatment with a suitable basic compound or with a suitable ion exchanger reagent and salts with bases, for example, by treatment with a suitable acid or with a suitable ion exchanger reagent. Salts of compounds of formula (I) can be converted in a manner known per se into other salts of compounds of formula (I), acid addition salts, for example, into other acid addition salts, for example by treatment of a salt of inorganic acid such as hydrochloride with a suitable metal salt such as a sodium, barium or silver salt, of an acid, for example with silver acetate, in a suitable solvent in which an inorganic salt which forms, for example silver chloride, is insoluble and thus precipitates from the reaction mixture.

The invention is now illustrated in further details by the following examples, without imposing any limitation thereto.

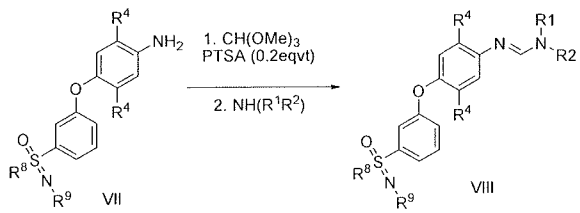


I

Compounds of the present invention as defined by general formula (I) and/or in Tables I-III may be prepared, in known manner, in a variety of ways as described in the schemes 1-24

General scheme for the prepartion of Substituted Sulfoximine O-linker arylimines:

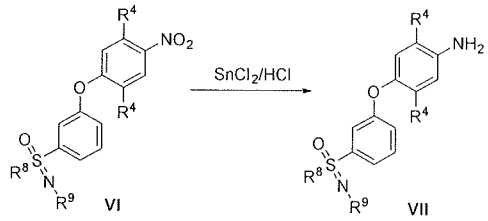
Scheme 1:



The compound of formula (VIII) can be prepared by treating the corresponding aniline derivative (VII) in excess of trimethylorthoformate using catalytic amount of p-toluenesulphonic acid. The resulting

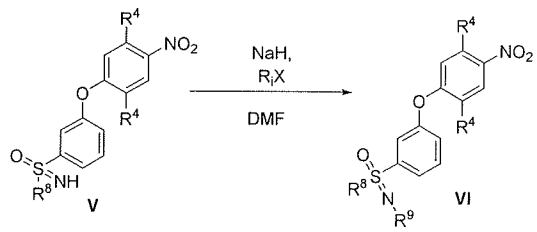
intermediate was heated with secondary amines (HNR_1R_2) in dioxane to get the compound of formula (VIII) following analogous procedure as mentioned in US20110130282

Scheme 2:



There are various methods available in the literature to reduce the nitro group of compound (VI). In one of the methods, the nitro group was reduced using Tin (II) chloride in hydrohloric acid in suitable solvent and temperature following analogous procedure as mentioned in the US2006/194801 A1.

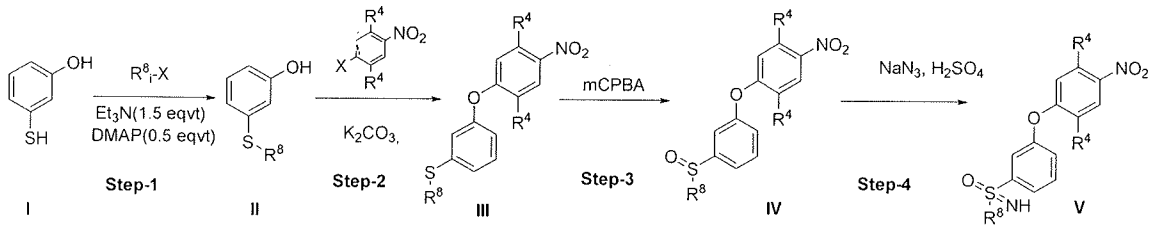
Scheme: 3



Compounds of formula (V) were N-alkylated in presence of base in suitable solvent following analogous procedure as mentioned in US2014/57926 A1 to afford compounds of type (VI)

Compound of formula (V) is a key intermediate and was prepared according to scheme 4.

Scheme: 4



Treatment of S-alkylated thiophenols (II), with commercially available 4-halo or pseudo halogen substituted nitrobenzenes in presence of bases like potassium carbonate/cesium carbonate in N, N-dimethylformamide either at room temperature or 100 °C provided O-arylated compounds of formula

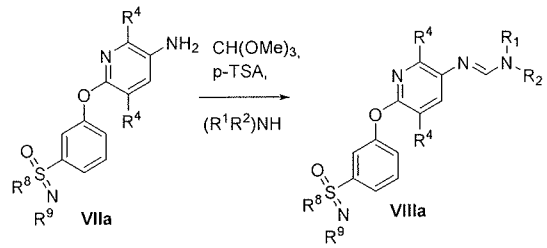
(III).

The compound of formula (III) was oxidised in presence of *m*-chloroperoxybenzoic acid in anhydrous dichloromethane, to provide the sulphoxide (IV) as an intermediate following analogous procedure as described in *Angewandte Chemie - International Edition, 2013 , vol. 52, # 14 p. 4008 - 4011*

The sulphoximines of the corresponding sulphoxides were prepared by treating the compounds of type (IV) with sodium azide and sulfuric acid in refluxing chloroform following analogus procedure as metioned in WO2008/155140 A1.

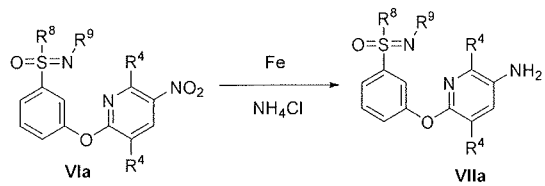
General Scheme for Substituted Sulfoximine O-linker pyridyl amidine:

Scheme 5:



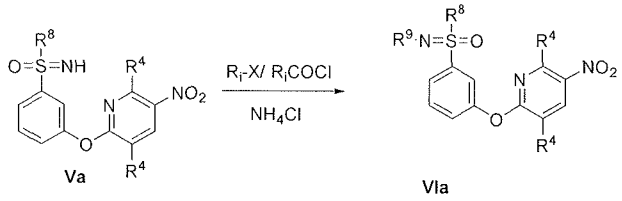
The compounds having general formula (VIIIa) were prepared from the corresponding amino derivatives having formula (VIIa) according to scheme 5. The synthetic protocols followed were similar to the one mentioned in US20110130282.

Scheme 6:



Compound of formula (VIIa) is a crucial intermediate and can be prepared as depicted in scheme 6 in which the nitro group of compound (VIa) was reduced to corresponding amine derivative by using known method of nitro reduction following analogous procedure as described in the litreature US2006/194801 A1 either by using Pd/C/hydrogen, Fe/NH_4Cl or $SnCl_2$ in ethyl acetate.

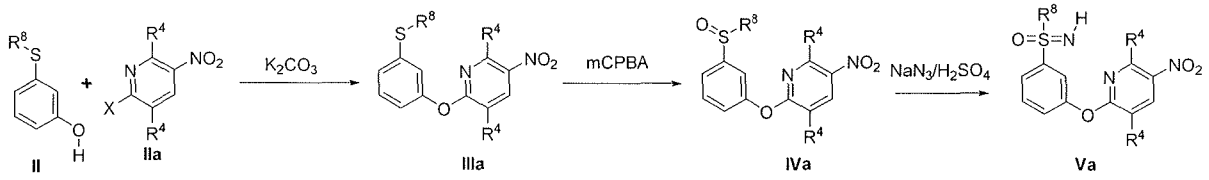
Scheme 7:



The treatment of compound (Va) in presence of bases like triethyl amine, sodium hydride, N,N-diisopropylethylamine and 4-dimethylaminopyridine provided the N-alkylated or acyalted compound (VIa) following analogous procedure as described in WO2008/155140 A1.

The compound (Va) is a common intermediate and can be prepared according to scheme 8.

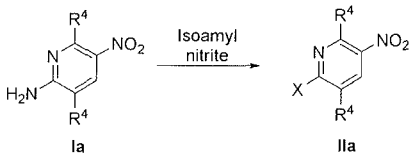
Scheme 8:



Compound of formula (II) was treated with halo pyridine (IIa) in presence of bases like cesium carbonate/pottasium carbonate or sodium hydride to provide the compound (IIIa) using the protocol described in the literature US2009/258876 A1; WO2005/70920 A1, Chemical Comm., 2013, vol. 49, #68 p. 7483 – 7485.

The oxidation of compound (IIIa) with m-chloroperbenzoic acid in dichloromethane provided the sulphoxide derivatives which upon treatment with sodium azide, sulfuric acid in refluxing chloroform yielded compound (Va) as mentioned in *Angewandte Chemie - International Edition, 2013, vol. 52, 14 p. 4008 – 4011* and WO2008/155140 A1.

Scheme 9:

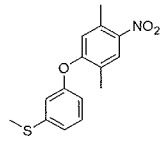


The compound of formula (IIa) was prepared as depicted by scheme 9 using the literature protocols as mentioned in WO2005/42464 A1, WO2015/55764 A1 and *Journal of Medicinal Chemistry, 2006,*

vol. 49, p. 727 – 739.

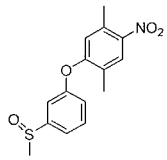
Example 1 Synthesis of N'-(4-(3-(N,S-dimethylsulfonimidoyl)phenoxy)-2,5-dimethylphenyl)-N-ethyl-N-methylformimidamide

Step 1: Synthesis of (3-(2,5-dimethyl-4-nitrophenoxy)phenyl)(methyl)sulfane:



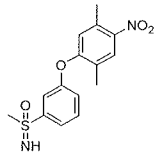
To a solution of 1-bromo-2,5-dimethyl-4-nitrobenzene (20 g, 87 mmol) in N,N-dimethylformamide (200 mL), 3-(methylthio)phenol (13.41 g, 96 mmol); potassium carbonate (36.0 g, 261 mmol) was added. The reaction mixture was heated to 130 °C for 24 h. After completion of reaction, the reaction mixture was cooled to room temperature and diluted with water. The miture was extracted with ethyl acetate; organic layer was washed with water, followed by brine; dried over anhydrous sodium sulphate and concentrated. The crude product was purified by column chromatography (Hexane/Ethyl Acetate 8:2) to provide (3-(2,5-dimethyl-4-nitrophenoxy)phenyl)(methyl)sulfane (15 g, 59.6 % yield).

Step 2: Synthesis of 1,4-dimethyl-2-(3-(methylsulfinyl)phenoxy)-5-nitrobenzene



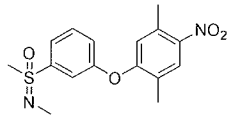
To a solution of (3-(2,5-dimethyl-4-nitrophenoxy)phenyl)(methyl)sulfane (19 g, 65.7 mmol) in dichloromethane (300 mL), *m*-chloroperoxybenzoic acid (14.73 g, 85 mmol) was added in portions at 0 °C and reaction was stirred for 6 h. After completion of the reaction, the reaction mixture was diluted with water; extracted with dichloromethane, organic layer was separated, washed with 1N sodium hydroxide solution, dried over anhydrous sodium sulphate, concentrated and purified by column chromatography (Hexane/Ethyl Acetate 7:3) to obtain 1,4-dimethyl-2-(3-(methylsulfinyl)phenoxy)-5-nitrobenzene (14 g, 69.8 % yield).

Step 3: Synthesis of (3-(2,5-dimethyl-4-nitrophenoxy)phenyl)(imino)(methyl)-λ^6-sulfanone



To a solution of (3-(2,5-dimethyl-4-nitrophenoxy)phenyl)(imino)(methyl)-λ^6-sulfanone (1.4 g, 4.37 mmol) in chloroform, sodium azide (0.57 g, 8.74 mmol) was charged and sulfuric acid (1.2 mL, 21.85 mmol) was added dropwise at 0 °C. After stirring for 45 min, the reaction temperature was allowed to rise to room temperature, and then the reaction mixture was heated to 45 °C for 20 h. After completion of the reaction, the mixture was slowly poured over crushed ice, neutralised with 1N NaOH solution and diluted with dichloromethane. Organic layer was separated, dried over anhydrous sodium sulphate, concentrated. The obtained crude product purified by column chromatography (Hexane/Ethyl Acetate 6:4) to obtain (3-(2,5-dimethyl-4-nitrophenoxy)phenyl)(imino)(methyl)-λ^6-sulfanone (1.2 g, 86 % yield).

Step 4: Synthesis of (3-(2,5-dimethyl-4-nitrophenoxy)phenyl)(methyl)(methylimino)-λ^6-sulfanone



To a suspension of sodium hydride (0.25 g, 6.24 mmol) in N,N-dimethylformamide (10 mL) at 0 °C, (3-(2,5-dimethyl-4-nitrophenoxy)phenyl)(imino)(methyl)- λ^6-sulfanone (1.0 g, 3.12 mmol) was added and reaction mixture was stirred for 20 min. Iodomethane (0.88 g, 6.24 mmol) was added dropwise to the reaction mixture at 0 °C and continued stirring for 1 h. After completion of reaction, reaction mixture was poured over crushed ice. Ethyl acetate was added and organic layer was separated, dried over anhydrous sodium sulphate and concentrated under reduced pressure. The obtained residue purified by column chromatography (Hexane/Ethyl Acetate 8:2) to provide (3-(2,5-dimethyl-4-nitrophenoxy)phenyl)(methyl)(methylimino)-λ^6-sulfanone (0.4 g, 38.3 % yield).

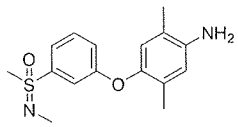
The following intermediates illustrated in Table I were prepared according to the process described in Example 1 step 4 using appropriate reactants:

Table I:

Sr. No	Intermediate	Yield (%)
1	(3-(5-chloro-2-methyl-4-nitrophenoxy)phenyl)(methyl)(prop-2-yn-1-ylimino)-λ^6-sulfanone	54.0
2	(3-(2,5-dimethyl-4-nitrophenoxy)phenyl)(ethylimino)(methyl)-λ^6-sulfanone	58.8

3	((cyclopropylmethyl)imino)(3-(2,5-dimethyl-4-nitrophenoxy)phenyl)(methyl)-λ^6-sulfanone	58.8
4	N-((3-(2,5-dimethyl-4-nitrophenoxy)phenyl)(methyl)(oxo)-λ^6-sulfanylidene)cyclobutanecarboxamide	93.0

Step 5: Synthesis of (3-(4-amino-2,5-dimethylphenoxy)phenyl)(methyl)(methylimino)-λ^6-sulfanone



To a mixture of (3-(2,5-dimethyl-4-nitrophenoxy)phenyl)(methyl)(methylimino)-λ^6-sulfanone (0.4 g, 1.196 mmol) in ethanol (16 mL)-water (4 mL), iron (0.67 g, 11.96 mmol) and ammonium chloride (0.26 g, 4.78 mmol) were charged and reaction mixture was heated to 65 °C for 1 h. After completion of reaction, solvent was evaporated under reduced pressure, the crude mixture was diluted with water and extracted with ethyl acetate. Organic layer was separated, dried over anhydrous sodium sulphate, concentrated under reduced pressure and purified by column chromatography (Hexane/Ethyl Acetate 9:1) to obtain (3-(4-amino-2,5-dimethylphenoxy)phenyl)(methyl)(methylimino)-λ^6-sulfanone (0.32 g, 88 % yield).

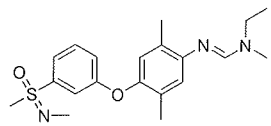
The following compounds illustrated in Table II were prepared according to the process described in Example 1 step 5 using appropriate reactants:

Table II:

Sr. No	Compounds	Yield (%)
1	(3-(4-amino-5-chloro-2-methylphenoxy)phenyl)(methyl)(prop-2-yn-1-ylimino)-λ^6-sulfanone	87
2	(3-(4-amino-2,5-dimethylphenoxy)phenyl)(ethylimino)(methyl)-λ^6-sulfanone	99
3	N-((3-(4-amino-2,5-dimethylphenoxy)phenyl)(methyl)(oxo)-λ^6-sulfanylidene) cyclobutanecarboxamide	98
4	(3-(4-amino-2,5-dimethylphenoxy)phenyl)(methyl)((2,2,2-trifluoroethyl)imino)-λ^6-sulfanone	87
5	(3-(4-amino-2,5-dimethylphenoxy)phenyl)(methyl)(phenylimino)-λ^6-sulfanone	95
6	(3-(4-amino-2,5-dimethylphenoxy)phenyl)(methyl)(pyridin-2-ylimino)-λ^6-	95

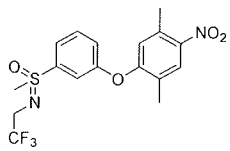
	sulfanone	
7	(3-(4-amino-2,5-dimethylphenoxy)phenyl)((cyclobutylmethyl)imino)(methyl)-λ^6-sulfanone	99

Step 6: Synthesis of N'-(4-(3-(N,S-dimethylsulfonimidoyl)phenoxy)-2,5-dimethylphenyl)-N-ethyl-N-methylformimidamide



To a solution of (3-(4-amino-2,5-dimethylphenoxy)phenyl)(methyl)(methylimino)-λ^6-sulfanone (0.5 g, 1.643 mmol) in trimethyl orthoformate (25 mL), p-toluenesulfonic acid monohydrate (0.02 g, 0.082 mmol) was added and reaction mixture was refluxed for 4 h at 103 °C. After completion of reaction, the volatiles were evaporated to give the intermediate. This intermediate was dissoved in anhydrous 1,4-dioxane (25 mL) and N-ethylmethylamine (0.714 mL, 8.21 mmol) was added dropwise under nitrogen atmosphere. The reaction mixture was refluxed for 30 h at 103 °C. After completion of reaction, the reaction mixture was concentrated under reduced pressure. The crude product was purified by column chromatography (Hexane/Ethyl Acetate 9:1) to provide N'-(4-(3-(N,S-dimethylsulfonimidoyl)phenoxy)-2,5-dimethylphenyl)-N-ethyl-N-methylformimidamide (0.35 g, 57.0 % yield). ^{1}H-NMR (400 MHz, DMSO-D6) δ 7.69 (br, 1H), 7.55-7.59 (t, 1H), 7.45 (d, 1H), 7.12-7.16 (m, 2H), 6.80 (s, 1H), 6.74 (s, 1H), 3.50-3.34 (2H), 3.09 (s, 3H), 2.93 (s, 3H), , 2.43 (s, 3H), 2.13 (s, 3H), 2.02 (s, 3H), 1.11-1.16 (t, 3H); LCMS (M+H): 375.6

Example 2: (3-(2,5-dimethyl-4-nitrophenoxy)phenyl)(methyl)((2,2,2-trifluoroethyl)imino)-λ^6-sulfanone



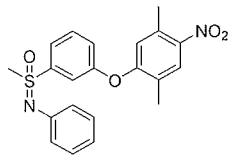
To a mixture of N-((3-(2,5-dimethyl-4-nitrophenoxy)phenyl)(methyl)(oxo)-λ^6-sulfanylidene)-2,2,2-trifluoroacetamide (1.5 g, 3.60 mmol) in dichloromethane (50 mL), borane-methyl sulfide complex (3.4 mL, 36.0 mmol) was added dropwise at 0 °C and stirred for 1 h. After completion of reaction, the reaction mixture was quenched by methanol and diluted with water. The mixture was extratcted with dichloromethane, organic layer was separated, dried over anhydrous sodium sulphate, filtered and

concentrated under reduced pressure. The crude product was purified by column chromatography (Hexane/Ethyl Acetate 9:1) to obtain (3-(2,5-dimethyl-4-nitrophenoxy)phenyl)(methyl)((2,2,2-trifluoroethyl)imino)-λ^6-sulfanone (1.4 g, 97 % yield).

Example 3: Synthesis of ((Cyclobutylmethyl)imino)(3-(2,5-dimethyl-4-nitrophenoxy)phenyl)(methyl)-λ^6-sulfanone

((Cyclobutylmethyl)imino)(3-(2,5-dimethyl-4-nitrophenoxy)phenyl)(methyl)-λ^6-sulfanone was prepared according to the process described in Example 2 (66.2.0% yield).

Example 4: Synthesis of (3-(2,5-Dimethyl-4-nitrophenoxy)phenyl)(methyl)(phenylimino)-λ^6-sulfanone



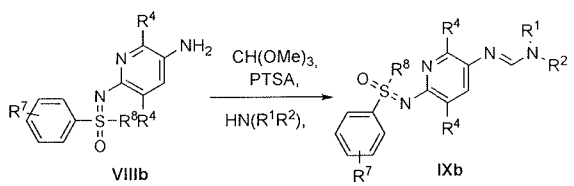
To a suspension of sodium hydride (0.2 g, 5 mmol) in N,N-dimethylformamide (10 mL) at 0 °C (3-(2,5-dimethyl-4-nitrophenoxy)phenyl)(imino)(methyl)-λ^6-sulfanone (0.8 g, 2.5 mmol) was added and reaction mixture was stirred for 20 min. Bromobenzene (0.47 g, 3.00 mmol) was added dropwise to the reaction mixture at 0 °C and maintained for 1 h. After completion of reaction, the reaction mixture was poured over crushed ice, extracted with ethyl acetate, the organic layer was separated, dried over anhydrous sodium sulphate, filtered and concentrated under reduced pressure. The crude product was purified by column chromatography (Hexane/Ethyl Acetate 8:2) to obtain (3-(2,5-dimethyl-4-nitrophenoxy)phenyl)(methyl)(phenylimino)-λ^6-sulfanone (0.7 g, 71 % yield).

Example 5: (3-(2,5-dimethyl-4-nitrophenoxy)phenyl)(methyl)(pyridin-2-ylimino)-λ^6-sulfanone

(3-(2,5-dimethyl-4-nitrophenoxy)phenyl)(methyl)(pyridin-2-ylimino)-λ^6-sulfanone was prepared according to the process described in Example 4 (81.0 % yield).

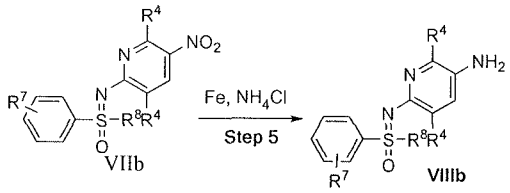
Synthesis of Sulfoximine N-linker Amidines:

Scheme 10:



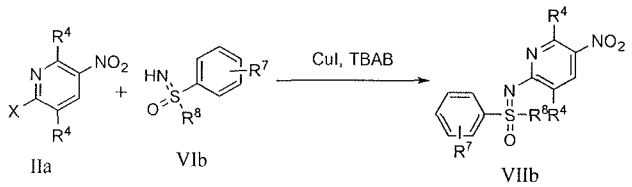
The compounds having general formula (IXb) were prepared from the corresponding amines having formula (VIIIb) according to the scheme 10. Wherein compound of Formula (VIIIb) were treated with trimethylortoformate and p-toluenesulfonic acid monohydrate followed by the reaction with different secondary amines (HNR^1R^2) to provide the final compounds (IXb) following analogous procedure as mentioned in US20110130282.

Scheme 11:



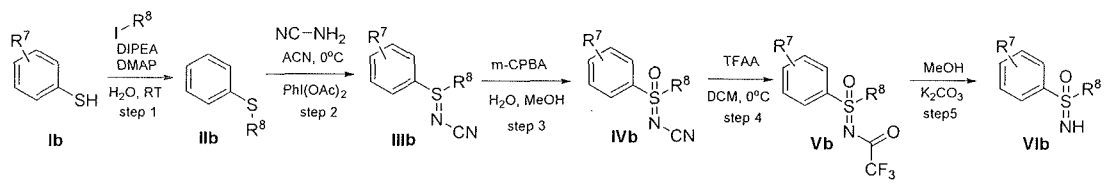
3-Nitropyridyl derivatives of formula (VIIb) was reduced in presence of reducing agent like Fe/NH_4Cl or $SnCl_2$ following analogous procedure as mentioned in US2006/194801 A1, provided desired product of formula (VIIIb).

Scheme: 12



The compound of formula (VIIb) was selectively prepared using copper medicated coupling of substitututed sulfoximine of formula (VIb) with substituted 3-nitro 6-halopyridines of formula (IIa) following analogous procedure as mentioned in *Tetrahedron Letters, 2004, vol. 45, 27 p. 5233 – 5236*, WO2011/29537 A1.

Scheme 13: Synthesis of Sulfoximine intermediate



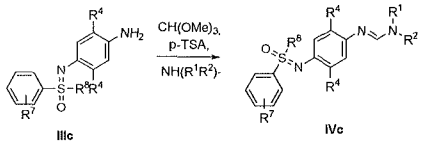
Substituted sulfoximine of formula (VIb) was prepared from the substituted aryl/hetroaryl thiophenols of formula (Ib). The thiophenols were alkylated with various alkyl halides as mentioned in *Synthetic*

Communications, 2008, vol. 38, 2 p. 282 – 289; WO2006/41888 A2, 2006. Compounds of formula (IIb) were further treated with cyanamide to afford the N-Cyano derivatives of formula (IIIb) which upon oxidation with an oxidising agent such as m-chloroperbenzoic acid or oxone or potassium permanganate in an appropriate solvent provided sulfoximine derivatives (IVb) following analogous procedure as metioned in *Org. Lett., 2007, 9 (19), pp 3809–3811.*

The sulfoximine of formula (IVb) was further treated with trifluoroacetic acid in dichloromethane to provide N-trifluoroacylated sulfoximine of formula (Vb) which upon treatment with potassium carbonate in methanol provided derivative of formula (VIb) following analogous procedure as mentioned in *Org. Process Res.Dev. 2015, 19, 454-462.*

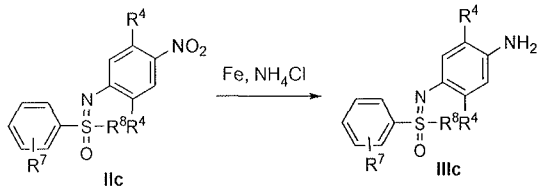
General Scheme for N-Linker Sulfoximine

Scheme 14



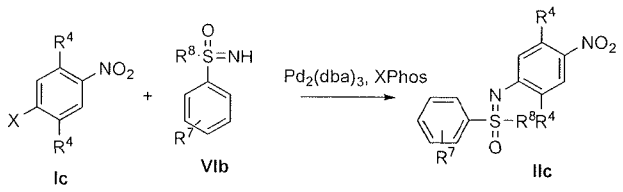
The compound of general formula (IVc) was prepared from the corresponding amino compounds (IIIc) according to scheme 14, wherein compound of Formula (IIIc) was treated with trimethylortoformate and p-toluenesulfonic acid monohydrate followed by the reaction with different secondary amines (HNR^1R^2) to provide the final compounds (IVc) following analogous procedure as mentioned in US20110130282.

Scheme 15



The nitro derivative of formula (IIc) was reduced in the presence of reducing agent like Fe/NH_4Cl or $SnCl_2$ following analogous procedure as mentioned in US2006/194801 A1 providing desired product (IIIc).

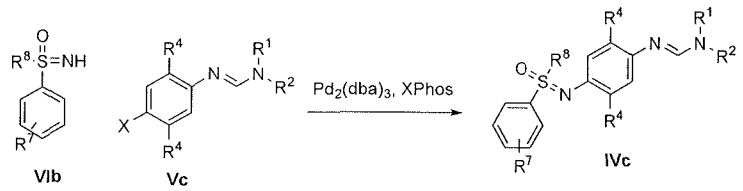
Scheme 16



Ic VIb IIc

The compound of formula (IIc) was prepared from palladium/copper mediated coupling of substituted sulfoximines of formula (VIb) with commerically available 4-nitro phenyl derivatives of formula (Ic) following analogous procedure as mentioned in Tetrahedron Letters, 2004, vol. 45, 27 p. 5233 – 5236, WO2011/29537 A1,

Scheme 17

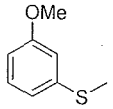


VIb Vc IVc

Alternative procedure where sulfoximine of formula (VIb) was treated with substituted aryl amidine derivatives of formula (Vc) in order to provide the final amidine derivative of formula (IVc)

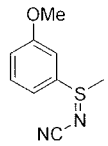
Example 6: Synthesis of imino(3-methoxyphenyl)(methyl)-λ^6-sulfanone

Step 1: Synthesis of (3-methoxyphenyl)(methyl)sulfane



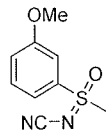
To a stirred solution of 3-(methylthio)phenol (1 g, 7.13 mmol) in acetonitrile (10 mL), potassium carbonate (1.972 g, 14.27 mmol) was added at 0 °C. The reaction was allowed to stirr for 20 min followed by dropwise addition of iodomethane (0.9 mL, 14.27 mmol) to the reaction mixture. The reaction mixture was heated to 45 °C for 8 h. After completion of reaction, acetonitrile was evaporated. The crude reaction mixture was taken in ethyl acetate (50 mL) and washed with brine solution. The organic layer was separated and dried over anhydrous sodium sulphate, filtered and concentrated to obtain (3-methoxyphenyl)(methyl)sulfane (0.935 g, 85 % yield)

Step 2: Synthesis of N-((3-methoxyphenyl)(methyl)-l4-sulfanylidene)cyanamide



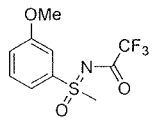
To a stirred solution of (3-methoxyphenyl)(methyl)sulfane (1 g, 6.48 mmol) in acetonitrile (10 mL), cyanamide (0.82 g, 19.45 mmol) was added at 0 °C followed by portionwise addition of iodobenzene diacetate (2.9 g, 9.08 mmol) and allowed to stir at same temperature for 3 h. After completion of reation, acteontrile was removed under reduced pressure. The crude product was purified by column chromatography to obtain N-((3-methoxyphenyl)(methyl)-λ^4-sulfanylidene)cyanamide (0.756 g, 60 % yield) as redish liquid.

Step 3: Synthesis of N-((3-methoxyphenyl)(methyl)(oxo)-λ^6-sulfanylidene)cyanamide



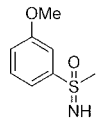
To a stirred solution of N-((3-methoxyphenyl)(methyl)-λ^4-sulfanylidene)cyanamide (1 g, 5.15 mmol) in methanol (10 mL) and water (5 mL), potassium carbonate (5 g, 36.0 mmol) was added at 0 °C and allowed to stir at same temerature for 20 min. To the resulting reaction mixture m-chloroperoxybenzoic acid (2.7 g, 15.44 mmol) was added in portions. The reaction was allowed to stir at same temperature. After completion of the reaction, solvent was evaporated under reduced pressure and crude mixture was extracted with ethyl acetate. The organic layer was washed with brine, dried over anhydrous sodium sulphate, filtered and concentrated. The crude product was purifided by column chromatography to obtain N-((3-methoxyphenyl)(methyl)(oxo)-λ^6-sulfanylidene)cyanamide (0.920 g, 85 % yield)

Step 4: Synthesis of 2,2,2-trifluoro-N-((3-methoxyphenyl)(methyl)(oxo)-λ^6-sulfanylidene) acetamide



To a stirred solution of N-((3-methoxyphenyl)(methyl)(oxo)-λ^6-sulfanylidene)cyanamide (1 g, 4.76 mmol) in dichloromethane (5 mL), trifluoroacetic anhydride (2 mL, 14.27 mmol) was added dropwise at 0 °C and allowed to stir at same temperature for 2 h. After completion of the reaction, solvent was concentrated to obtain 2,2,2-trifluoro-N-((3-methoxyphenyl)(methyl)(oxo)-λ^6-sulfanylidene) acetamide (1.137 g, 85 % yield). The product was used for the next step without further purification.

Step 5: Synthesis of imino(3-methoxyphenyl)(methyl)-λ^6-sulfanone



To a stirred solution of 2,2,2-trifluoro-N-((3-methoxyphenyl)(methyl)(oxo)-λ^6-sulfanylidene) acetamide (1 g, 3.56 mmol) in methanol (10 mL), potassium carbonate (3.44 g, 24.89 mmol) was added at 0 °C. After completion of the reaction, the reaction mixture was evaporated to obtain crude product which was purified by column chromatography to obtain imino(3-methoxyphenyl)(methyl)-λ^6-sulfanone (0.527 g, 80 % yield).

Example 7: Imino(isopropyl)(3-methoxyphenyl)-λ^6-sulfanone

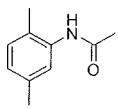
Imino(isopropyl)(3-methoxyphenyl)-λ^6-sulfanone was prepared according to example 5 steps 1-6 using 3-mercaptophenol and 2-bromopropane as reactants. Yield: 80 %.

Example 8: Imino(isopentyl)(3-methoxyphenyl)-λ^6-sulfanone

Imino(isopentyl)(3-methoxyphenyl)-λ^6-sulfanone was prepared according to example 5 steps 1-6 using 3-mercaptophenol and isopentyl bromide as reactants. Yield: 80 %.

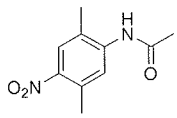
Example 9: 1-bromo-2,5-dimethyl-4-nitrobenzene

Step 1: Synthesis of N-(2,5-dimethylphenyl)acetamide:



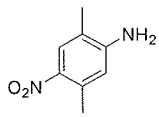
To a mixture of 2,5-dimethylaniline (30 g, 248 mmol) in dichloromethane (500 mL), triethylamine (104 mL, 743 mmol) was added and the reaction mixture was stirred for 20 min at 0 °C. Trifluoroacetic anhydride (157 mL, 1114 mmol) was added dropwise to the reaction mixture at 0 °C and maintained for 2 h. After completion of the reaction, the reaction mixture was poured over crushed ice, dichloromethane was added. The organic layer was separated, dried over anhydrous sodium sulphate, concentrated under reduced pressure and purified by column chromatography (Hexane/Ethyl Acetate 8:2) to obtain N-(2,5-dimethylphenyl)acetamide (38 g, 94 % yield).

Step 2: Synthesis of N-(2,5-dimethyl-4-nitrophenyl)acetamide



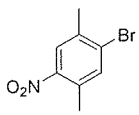
To a mixture of N-(2,5-dimethylphenyl)acetamide (38 g, 233 mmol) in sulfuric acid (56 mL, 1048 mmol), nitric acid (17 mL, 379 mmol) was added dropwise at 0 °C and stirred for 45 min. After completion of the reaction, the reaction mixture was poured over crushed ice and extracted by dichloromethane. Organic layer was separated, dried over anhydrous sodium sulphate, concentrated under reduced pressure and purified by column chromatography (Hexane/Ethyl Acetate 1:1) to obtain N-(2,5-dimethyl-4-nitrophenyl)acetamide (41 g, 85 % yield).

Step 3: Synthesis of 2,5-dimethyl-4-nitroaniline



To a mixture of sodium hydroxide (231 g, 5763 mmol) in water (700 mL), N-(2,5-dimethyl-4-nitrophenyl)acetamide (40 g, 192 mmol) was added and refluxed for 4 h. After completion of the reaction, the reaction mixture was allowed to cool to room temperature, extracted with dichloromethane. Organic layer was separated, washed with brine, dried over anhydrous sodium sulphate and concentrated under reduced pressure to obtain the crude product. Crude product was purified by column chromatography (dichlorometane) to obtain 2,5-dimethyl-4-nitroaniline (21 g, 65.8 % yield).

Step 4: Synthesis of 1-bromo-2,5-dimethyl-4-nitrobenzene



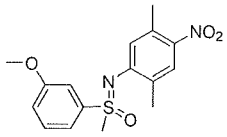
Part A- Preparation of Copper (I) bromide solution

A solution of copper(I) bromide (72.5 g, 505 mmol) in hydrochloric acid, 37% (150 mL) was heated to 80 °C to obtain a clear solution.

Part B- To a mixture of 2,5-dimethyl-4-nitroaniline (21 g, 126 mmol) in conc. hydrochloric acid, (150 mL), a saturated solution of sodium nitrite (17.5 g, 253 mmol) in water (20 mL) was added dropwise at 0 °C and mixture was stirred for 30 min. After 30 min, above (Part-A) solution of copper (I) bromide (72.5 g, 505 mmol) was added dropwise at 0 °C. After complete addition, mixture was heated to 80 °C for 1 h.

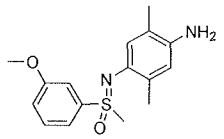
The reaction mixture was diluted with water, extracted with ethyl acetate. The organic layer was dried over anhydrous sodium sulfate, concentrated under reduced pressure and purified by column chromatography (Hexane/EthylAcetate (8:2) to obtain 1-bromo-2,5-dimethyl-4-nitrobenzene (22 g, 76 % yield).

Step 5: Synthesis of ((2,5-dimethyl-4-nitrophenyl)imino)(3-methoxyphenyl)(methyl)-λ^6-sulfanone



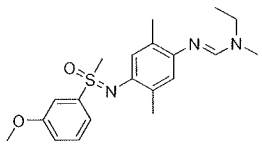
To a mixture of 1-bromo-2,5-dimethyl-4-nitrobenzene (0.5 g, 2.173 mmol) in toluene (20 mL), imino(3-methoxyphenyl)(methyl)-λ^6-sulfanone (0.48 g, 2.61 mmol), cesium carbonate (2.12 g, 6.52 mmol) and XPHOS (0.1 g, 0.217 mmol) were added at room temperature. The reaction mixture was purged with nitrogen for 10 min, followed by addition of catalyst tris(dibenzylideneacetone)dipalladium(0) (0.1 g, 0.11 mmol) under nitrogen atmosphere and the reaction mixture was refluxed for 3 h. After completion of the reaction, the reaction mixture was allowed to cool at room temperature and filtered over cellite. The filtrate was concentrated under reduced pressure and purified by column chromatography (Hexane/EthylAcetate 8:2) to obtain ((2,5-dimethyl-4-nitrophenyl)imino)(3-methoxyphenyl)(methyl)-λ^6-sulfanone (0.69 g, 95 % yield).

Step 6: Synthesis of ((4-amino-2,5-dimethylphenyl)imino)(3-methoxyphenyl)(methyl)-λ^6-sulfanone



To a mixture of ((2,5-dimethyl-4-nitrophenyl)imino)(3-methoxyphenyl)(methyl)-λ^6-sulfanone (0.82 g, 2.45 mmol) in ethanol (16 mL)-water (4 mL), iron (1.37 g, 24.52 mmol) and ammonium chloride (0.56 g, 9.81 mmol) were added and the reaction mixture was heated to 65 °C for 1 h. After completion of reaction, the reaction mixture was concentrated under reduced pressure, diluted with water. Ethyl acetate was added and organic layer was separated, dried over anhydrous sodium sulfate, concentrated under reduced pressure and purified by chromatography (Hexane/Ethyl Acetate 9:1) to obtain ((4-amino-2,5-dimethylphenyl)imino)(3-methoxyphenyl)(methyl)-λ^6-sulfanone (0.5 g, 67.0 % yield).

Step 7: Synthesis of N-ethyl-N'-(4-(((3-methoxyphenyl)(methyl)(oxo)-λ^6-sulfanylidene)amino)-2,5-dimethylphenyl)-N-methylformimidamide



To a solution of ((4-amino-2,5-dimethylphenyl)imino)(3-methoxyphenyl)(methyl)-λ^6-sulfanone (0.5 g, 1.53 mmol) in trimethyl orthoformate (25 mL), p-toluenesulfonic acid monohydrate (0.015 g, 0.077 mmol) was added and the mixture was refluxed for 4 h. After completion of the reaction, the volatiles were evaporated to give the intermediate. This intermediate was dissoved in 1,4-dioxane (25 mL) and N-ethylmethylamine (0.7 mL, 7.65 mmol) was added under nitrogen atmosphere. The reaction mixture was refluxed for 3 h. After completion of the reaction, the reaction mixture was concentrated under reduced pressure. The residue obtained was purified by column chromatography (Hexane/EthylAcetate 9:1) to provide N-ethyl-N'-(4-(((3-methoxyphenyl)(methyl)(oxo)-λ^6-sulfanylidene)amino)-2,5-dimethylphenyl)-N-methylformimidamide (0.2 g, 35.0 % yield) as a gum; ^{1}H-NMR (400 MHz, DMSO-D6) δ 7.47-7.54 (m, 3H), 7.39 (t, 1H), 7.21 (dq, 1H), 6.66 (s, 1H), 6.49 (s, 1H), 3.80 (s, 3H), 3.27-3.29 (5H), 2.89 (s, 3H), 2.18 (s, 3H), 1.94 (s, 3H), 1.08 (t, 3H); LCMS (M+H):374.2

Example 10: ((4-amino-2,5-dimethylphenyl)imino)(isopropyl)(phenyl)-λ^6-sulfanone

Step 1: ((2,5-Dimethyl-4-nitrophenyl)imino)(isopropyl)(phenyl)-λ^6-sulfanone was prepared according to the process described in example 8 step 5. Yield: 81.0 %.

Step 2: ((4-Amino-2,5-dimethylphenyl)imino)(isopropyl)(phenyl)-λ^6-sulfanone was prepared according to the process described in example 8 step 6. Yield: 67.0 %.

Example 11: ((4-amino-2,5-dimethylphenyl)imino)(isopentyl)(phenyl)-λ^6-sulfanone

Step 1: ((2,5-Dimethyl-4-nitrophenyl)imino)(isopentyl)(phenyl)-λ^6-sulfanone was prepared according to the process described in example 8 step 5. Yield: 81.0 %.

Step 2: ((4-Amino-2,5-dimethylphenyl)imino)(isopentyl)(phenyl)-λ^6-sulfanone was prepared according to the process described in example 8 step 6. Yield: 94.0 %.

Example 12: ((4-Amino-2,5-dimethylphenyl)imino)(isopropyl)(3-methoxyphenyl)-λ^6-sulfanone

Step 1: ((2,5-Dimethyl-4-nitrophenyl)imino)(isopropyl)(3-methoxyphenyl)-λ^6-sulfanone was prepared according to the process described in example 8 step 5. Yield: 83.0 %.

Step 2: ((4-Amino-2,5-dimethylphenyl)imino)(isopropyl)(3-methoxyphenyl)-λ^6-sulfanone was prepared according to the process described in example 8 step 6. Yield: 87.0 %.

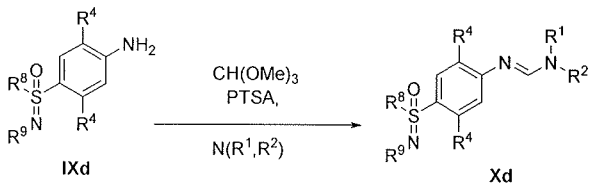
Example 13: ((4-Amino-2,5-dimethylphenyl)imino)(isopentyl)(3-methoxyphenyl)-λ^6-sulfanone

Step 1: ((2,5-Dimethyl-4-nitrophenyl)imino)(isopentyl)(3-methoxyphenyl)-λ^6-sulfanone was prepared according to the process described in example 8 step 5. Yield: 77.0 %.

Step 2: ((4-Amino-2,5-dimethylphenyl)imino)(isopentyl)(3-methoxyphenyl)-λ^6-sulfanone was prepared according to the process described in example 8 step 6. Yield: 91.0 %.

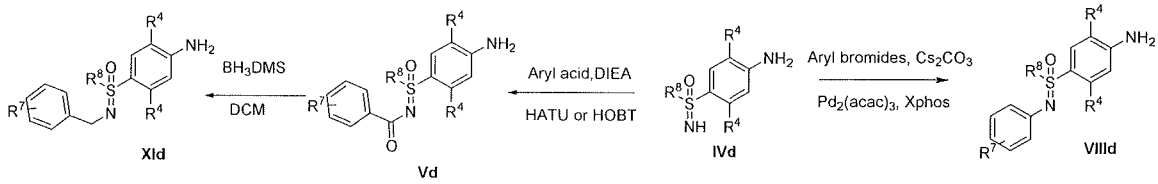
General Scheme for S-Linker Sulfilimines or Sulfoximines

Scheme 18



The compounds having general formula (Xd) were prepared from the corresponding amino compounds (IXd) according to scheme 18, wherein compound of Formula (IXd) were treated with trimethylortoformate and p-toluenesulfonic acid monohydrate followed by the reaction with different secondary amines (HNR^1R^2) to provide the final compounds (Xd) following analogous procedure as mentioned in US20110130282.

Scheme 19

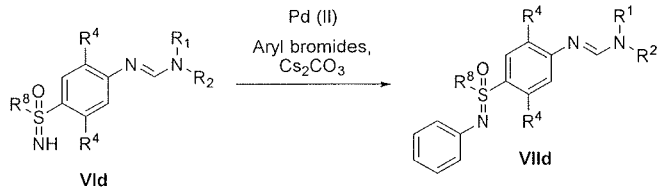


Compounds of formula (XId) can be synthesised from (IVd) by selectively derivatising at sulphoximine as shown in scheme 19.

The compound of formula (IVd) can be selectivley N-arylated at the sulphoximine function to obtain compound of formula (VIIId) by using Buchwald conditions mentioned in scheme 19. Alternatively the arylation can also be done on the compound of formula (VId) with similar conditions to get compound of formula (VIId) as show in scheme 20.

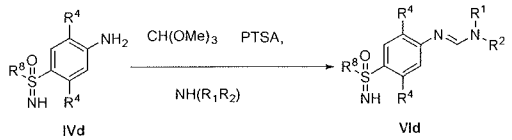
The compound (IVd) can be selectively derivatised to compound of formula (Vd) and further conversion to formula (XId) (as mentioned in WO2008/155140) as shown in scheme 19.

Scheme 20



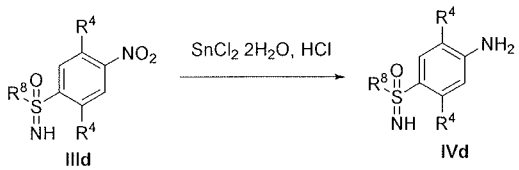
The compound of formula (VIId) was prepared from palladium/copper mediated coupling of substituted sulfoximines of formula (VId) with commerically available aryl halide derivatives following analogous procedure as mentioned in Tetrahedron Letters, 2004, vol. 45, # 27 p. 5233 – 5236, WO2011/29537.

Scheme 21



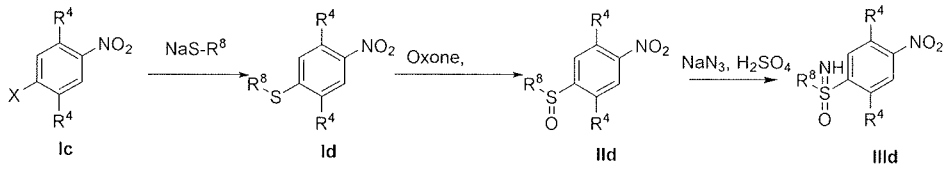
Compounds of formula (VId) were prepared according to scheme 21 by treating the aniline derivatives with trimethylortoformate and p-toluenesulfonic acid monohydrate followed by the reaction with different secondary amines (HNR^1R^2) following analogous procedure as mentioned in US20110130282.

Scheme 22



The nitro group in compound of formula (IIId) was reduced by Tin(II) chloride in HCl using 1,4-dioxane as solvent at 50 °C for 2 h, following analogous procedure as mentioned in the US2006/194801 A1.

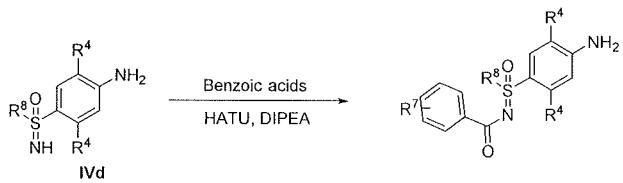
Scheme 23



The sulphoximine derivatives of formula (IIId) were prepared from sulphoxide derivative of formula (IId) in presence of NaN_3/H_2SO_4 in refluxing chloroform following analogous procedure as described in WO2008/155140.

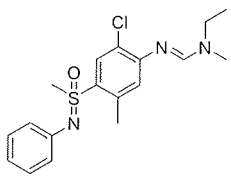
Thioether of formula (Id) was prepared by substitution reaction of 4-halogen substituted nitrobenzene with sodium salt of thiol derivatives, in refluxing tetrahydrofuran which upon oxidation at sulphur with m-chloroperbenzoic acid in dichloromethane or oxone in dioxane to provide the compound of formula (IId) following analogous procedure as mentioned in *Angewandte Chemie-International Edition, 2013, vol. 52, 14 p. 4008 – 4011.*

Scheme 24



The sulphoximine derivatives of formula (IVd) were N-acylated at sulphoximine selectively by using corresponding acids in presence of reactants such as HATU/DIPEA, HOBT or EDCI to obtain compound of formula (Vd)

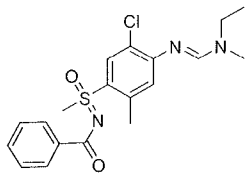
Example 14: Synthesis of N'-(2-chloro-5-methyl-4-(S-methyl-N-phenylsulfonimidoyl)phenyl)-N-ethyl-N-methylformimidamide



To a mixture of N'-(2-chloro-5-methyl-4-(S-methylsulfonimidoyl)phenyl)-N-ethyl-N-methylformimidamide (400 mg, 1.390 mmol), bromobenzene (436 mg, 2.78 mmol) and cesium carbonate (1358 mg, 4.17 mmol) in toluene (30 mL), tris(dibenzylideneacetone)dipalladium(0) (38 mg, 0.042 mmol) and XPHOS (66.3 mg, 0.139 mmol) were added under nitrogen atmosphere. Reaction mixture was

sonicated under nitrogen purging for 20 min and heated at 115 °C for 12 h. After completion of reaction, inorganics were filtered; solvent was evaporated and crude residue was subjected to column purification to obtain N'-(2-chloro-5-methyl-4-(S-methyl-N-phenylsulfonimidoyl)phenyl)-N-ethyl-N-methylformimidamide (0.35 g, 69.2 % yield). ^{1}H-NMR (400 MHz, DMSO-D6) δ 7.82 (br, 2H), 7.06-7.11 (m, 2H), 6.96 (d, 1H), 6.77-6.82 (m, 3H), 3.38-3.48 (2H), 3.04-2.91 (3H), 2.48 (s, 3H), 1.09-1.16 (m, 3H) LCMS (M+H): 364.8

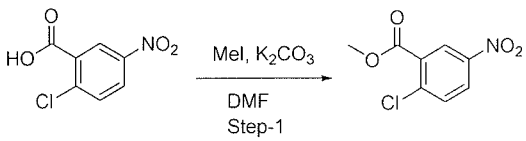
Example 15: Synthesis of N-((5-chloro-4-(((ethyl(methyl)amino)methylene)amino)-2-methylphenyl)(methyl)(oxo)-λ^6-sulfanylidene)benzamide



To a solution of N-((4-amino-5-chloro-2-methylphenyl)(methyl)(oxo)-λ^6-sulfanylidene)benzamide (300 mg, 0.929 mmol) in trimethyl orthoformate (30 mL), p-toluenesulfonic acid monohydrate (18 mg, 0.093 mmol) was added and refluxed for 4 h to obtain an intermediate. Trimethyl orthoformate was removed under reduced pressure, the intermediate was dissolved in 1,4-dioxane (30 mL), N-ethylmethylamine (0.242 mL, 2.79 mmol) was added and heated at 100 °C for 2 h. After completion of reaction, 1,4-dioxane was evaporated and crude compound was purified by column chromatography to provide desired N-((5-chloro-4-(((ethyl(methyl)amino)methylene)amino)-2-methylphenyl)(methyl)(oxo)-λ^6-sulfanylidene)benzamide (0.24 g, 65.9 % yield) ^{1}H-NMR (400 MHz, DMSO-D6) δ 7.98-8.00 (m, 2H), 7.94 (s, 1H), 7.85 (1H), 7.54-7.59 (m, 1H), 7.45-7.48 (m, 2H), 7.10-7.03 (m, 1H), 3.57 (s, 3H), 3.54-3.36 (2H), 3.02-2.99 (3H), 2.48 (s, 2H), 1.12-1.19 (m, 3H); LCMS (M+H): 392.2

Example 16: Synthesis of N'-(1-(4-bromobenzyl)-1-oxido-3-oxo-3H-1λ^4-benzo[d]isothiazol-5-yl)-N-ethyl-N-methylformimidamide

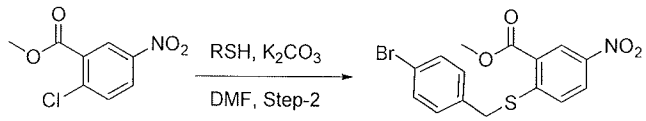
Step-1: Preparation of methyl 2-chloro-5-nitrobenzoate:



To a solution of 2-chloro-5-nitrobenzoic acid (10 g, 49.6 mmol) in N,N-dimethylformamide (100 mL), potassium carbonate (13.7 g, 99 mmol) was added at room temperature. The suspension was cooled to 0 °C and methyl iodide (14 g, 99 mmol) was added. The reaction mixture was stirred at room temperature for 2 h. After completion of the reaction, the reaction mixture was diluted with cold water and extracted

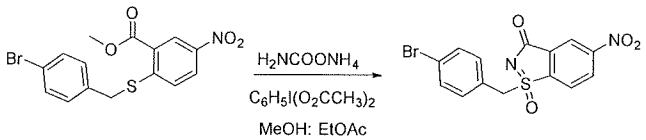
with ethyl acetate (3X300 mL). The combined organic layers were washed with water (2X100 mL), brine solution (100 mL), dried over anhydrous sodium sulphate. The organic solvent was removed under reduced pressure to afford methyl 2-chloro-5-nitrobenzoate (8.5 g, 79 %)

Step-2: Methyl 2-((4-bromobenzyl)thio)-5-nitrobenzoate



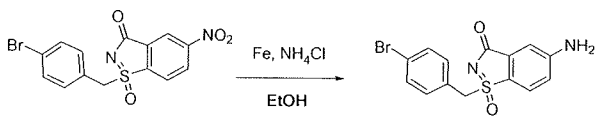
To a solution of methyl 2-chloro-5-nitrobenzoate (3 g, 13.92 mmol) in N,N-dimethylformamide (30 mL), potassium carbonate (3.85 g, 27.8 mmol) was added followed by the addition of (4-bromophenyl)methane thiol (4.24 g, 20.87 mmol) at room temperature. The reaction mixture was heated at 70 °C for 5 h. After the completion of the reaction, the reaction mixture was cooled to room temperature and diluted with cold water. The solid obtained was filtered, washed with water and dried under vacuum to obtain methyl 2-((4-bromobenzyl)thio)-5-nitrobenzoate (3.5 g, 65 %) as yellowish solid. MS: 383.0 (M+1).

Step-3: Preparation of 1-(4-bromobenzyl)-5-nitro-3H-1λ^4-benzo[d]isothiazol-3-one 1-oxide



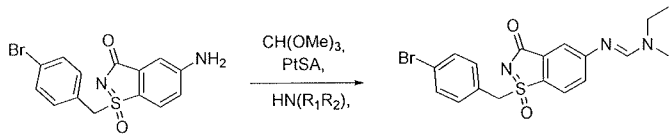
To a solution of methyl 2-((4-bromobenzyl)thio)-5-nitrobenzoate (5.0 g, 13.08 mmol) in 1:1 methanol and ethyl acetate (90 mL) ammonium carbamate (4.09 g, 52.3 mmol) was added at 0 °C followed by the addition of iodobenzene diacetate (9.27 g, 28.8 mmol). The resulting reaction mixture was stirred at room temperature for 12 h. After completion of the reaction, the reaction mixture was concentrated to half of its volume and then diluted with water. The mixture was extracted with ethyl acetate (3X100 mL). The combined organic layers were washed with water (2X100 mL), brine solution (100 mL). The organic layer was separated and dried over anhydrous sodium sulphate. The organic solvent was evaporated under reduced pressure to get the product, which was purified by flash chromatography using Ethyl acetate/ Hexanes as eluent to provide 1-(4-bromobenzyl)-5-nitro-3H-1λ^4-benzo[d]isothiazol-3-one 1-oxide (1.5 g, 30.1 %); GCMS: 383.0 (M+1)

Step-4: 5-amino-1-(4-bromobenzyl)-3H-1λ^4-benzo[d]isothiazol-3-one 1-oxide



To a solution of 1-(4-bromobenzyl)-5-nitro-3H-1λ^4-benzo[d]isothiazol-3-one 1-oxide (0.7 g, 1.836 mmol) in 1:1 mixture of ethanol and water (16 mL), iron powder (0.51 g, 9.18 mmol) was added followed by addition of ammonium chloride (0.393 g, 7.35 mmol). The resulting mixture was stirred at 70 °C for 3 h. After completion of the reaction, the reaction mixture was filtered through celite, washed with methanol and ethyl acetate, the combined filtrate was evaporated and extracted with ethyl acetate (3X100 mL). The organic layer was washed with water (100mL), brine solution (100mL) and dried over anhydrous sodium sulphate. The organic solvent was removed under reduced pressure to get the product which was purified by flash chromatography using methanol/dichloromethane as eluent to afford 5-amino-1-(4-bromobenzyl)-3H-λ^4-benzo[d]isothiazol-3-one 1-oxide (0.32 g, 49.6 % yield). LCMS: (M+1): 352.90

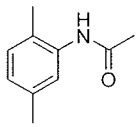
Step-5:- N'-(1-(4-bromobenzyl)-1-oxido-3-oxo-3H-1λ^4-benzo[d]isothiazol-5-yl)-N-ethyl-N-methylformimidamide



To a solution of 5-amino-1-(4-bromobenzyl)-3H-1λ^4-benzo[d]isothiazol-3-one 1-oxide (0.31 g, 0.883 mmol) in trimethylorthoformate (10 mL) was added p-toluenesulfonic acid monohydrate (8.39 mg, 0.044 mmol) at room temperature and resulting reaction mixture was stirred at 103 °C for 3 h. After completion of the reaction, the volatiles were evaporated under reduced pressure to obtain the intermediate which was dissolved in 1,4-dioxane (10 mL) and then added N-ethylmethylamine (0.4 ml, 4.41 mmol) at room temperature under nitrogen atmosphere. The reaction mixture was refluxed for 3 h. After completion of the reaction, the volatiles were evaporated under reduced pressure to obtain the crude product which was purified by flash chromatography using ethyl acetate and hexane as eluent to provide N'-(1-(4-bromobenzyl)-1-oxido-3-oxo-3H-1λ^4-benzo[d]isothiazol-5-yl)-N-ethyl-N-methylformimidamide (0.130 g, 35.0 % yield). ^{1}H-NMR (400 MHz, DMSO-D6) δ 8.11 (s, 1H), 8.02-7.94 (m, 1H), 7.49 (d, 2H), 7.31-7.17 (m, 4H), 5.36 (dd, 1H), 5.28 (d, 1H), 3.51-3.34 (m, 2H), 3.06 (s, 3H), 1.24 (t, 3H); LCMS (M+H): 421.80.

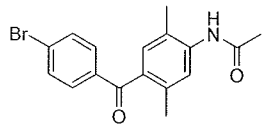
Example 16: Synthesis of N-ethyl-N'-(4-(4-(N-ethyl-S-methylsulfonimidoyl)benzyl)-2,5-dimethylphenyl)-N-methylformimidamide

Step 1: Synthesis of N-(2,5-dimethylphenyl)acetamide:



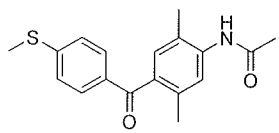
To a mixture of 2,5-dimethylaniline (30 g, 248 mmol) in dichloromethane (500 mL), triethylamine (104 mL, 743 mmol) was added and reaction mixture was stirred for 20 min at 0 °C. Trifluoroacetic anhydride (157 mL, 1114 mmol) was added dropwise to the reaction mixture at 0 °C and maintained for 2 h. After completion of the reaction, reaction mixture was poured over crushed ice. Dichloromethane was added and organic layer was separated, dried over anhydrous sodium sulphate, concentrated under reduced pressure and purified by column chromatography (Hexane/Ethyl Acetate 8:2) to obtain N-(2,5-dimethylphenyl)acetamide (38 g, 94 % yield).

Step 2: Synthesis of N-(4-(4-bromobenzoyl)-2,5-dimethylphenyl)acetamide:



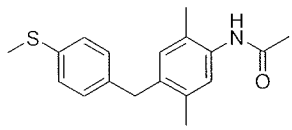
To a mixture of N-(2,5-dimethylphenyl)acetamide (5 g, 30.6 mmol) in dichloromethane (20 mL), aluminum chloride (12.25 g, 92 mmol) was added and reaction mixture was stirred for 20 min at 0 °C. To the resulting suspension 4-bromobenzoyl chloride (10 g, 46.0 mmol) was added slowly and heated the reaction mixture at 100 °C for 2 h. After completion of reaction, the reaction mixture was quenched cautiously by addition of water, extracted with ethyl acetate (3 x 100 mL), washed with water (3 x 100 mL), brine (200 mL). The organic layer was dried over anhydrous sodium sulphate and evaporated to provide N-(4-(4-bromobenzoyl)-2,5-dimethylphenyl)acetamide (7.5 g, 71 % yield) as solid.

Step 3: Synthesis of N-(2,5-dimethyl-4-(4-(methylthio)benzoyl)phenyl)acetamide:



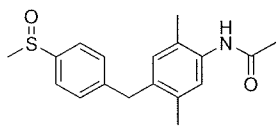
To a mixture of N-(4-(4-bromobenzoyl)-2,5-dimethylphenyl)acetamide (6 g, 17.33 mmol) in N,N-dimethylformamide (80 mL), cuprous iodide (0.660 g, 3.47 mmol) and sodium methanethiolate, 21% aqueous solution (11.57 g, 34.7 mmol) were charged and the mixture was heated at 100 °C for 2 h. Reaction mixture was quenched with ice water, extracted with ethyl acetate (3 x 100 mL), washed with brine (3 x 100 mL). The organic layer was dried over anhydrous sodium sulphate, filtered and evaporated to give N-(2,5-dimethyl-4-(4-(methylthio)benzoyl)phenyl)acetamide (4 g, 74 % yield) as solid.

Step 4: Synthesis of N-(2,5-dimethyl-4-(4-(methylthio)benzyl)phenyl)acetamide



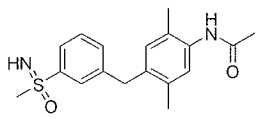
To a mixture of N-(2,5-dimethyl-4-(4-(methylthio)benzoyl)phenyl)acetamide (2.4 g, 7.66 mmol) in dichloromethane (40 mL), triethylsilane (6 mL, 38.3 mmol) and boron trifluoride etherate (10.8 mL, 38.3 mmol) were added. The reaction mixture was stirred at room temperature for 36 h. After completion of reaction, the reaction mixture was quenched with sodium bicarbonate, extracted with ethyl acetate (3 x 100 mL) and washed with brine. The organic layer was separated, dried over anhydrous sodium sulphate and evaporated to provide N-(2,5-dimethyl-4-(4-(methylthio)benzyl)phenyl)acetamide (1.7 g, 74 % yield) as solid.

Step 5: Synthesis of N-(2,5-dimethyl-4-(4-(methylsulfinyl)benzyl)phenyl)acetamide



To a mixture of N-(2,5-dimethyl-4-(4-(methylthio)benzyl)phenyl)acetamide (2.8 g, 9.35 mmol) in ethanol (50 mL), oxone (2.9 g, 9.35 mmol) was added and the reaction mixture was heated at 65 °C for 2 h. After completion of reaction, oxone was filtered, filtrate was evaporated, washed with brine and extrated in dichlorometahne (2 x 100 mL). The organic layer was separated, dried over anhydrous sodium sulphate and evaporated to provide N-(2,5-dimethyl-4-(4-(methylsulfinyl)benzyl)phenyl)acetamide (2.6 g, 88 % yield) as gum.

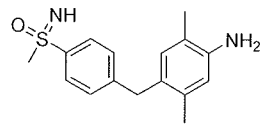
Step 6: Synthesis of N-(2,5-dimethyl-4-(4-(S-methylsulfonimidoyl)benzyl)phenyl)acetamide



To a mixture of N-(2,5-dimethyl-4-(4-(methylsulfinyl)benzyl)phenyl)acetamide (2.68 g, 8.50 mmol) in chloroform (50 mL), sodium azide (2.2 g, 34.0 mmol) was added and the reaction mixture was cooled to 0-5 °C. To this solution conc. sulfuric acid (3.62 mL, 68.0 mmol) was added cautiously and after completion of addition slowly raised temperature to 45 °C, allowed to stir at this temperature for 24 h. After completion of reaction, the reaction mixture was was neutralised, extracted with ethyl acetate (3 x 100 mL), washed with water (3 x 100 mL). The organic layer was dried over anhydrous sodium sulphate

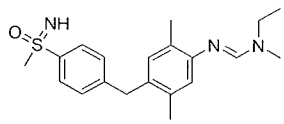
and evaporated to provide N-(2,5-dimethyl-4-(4-(S-methylsulfonimidoyl)benzyl)phenyl)acetamide (2.45 g, 87 % yield) as solid.

Step 7: Synthesis of (3-(4-amino-2,5-dimethylbenzyl)phenyl)(imino)(methyl)- λ6-sulfanone



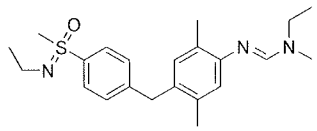
To a mixture of N-(2,5-dimethyl-4-(3-(S-methylsulfonimidoyl)benzyl)phenyl)acetamide (1 g, 3.03 mmol) in ethanol (20 mL), potassium hydroxide (5.1 g, 90.8 mmol) in water (10 mL) was charged and heated at 100 °C for 24 h. After completion of reaction, the reaction mixture was quenched with crushed ice and extracted with ethyl acetate (3 x 20 mL). The organic layer was separated, dried over anhydrous sodium sulphate and evaporated to provide crude product which was further purified by column chromatography to provide (3-(4-amino-2,5-dimethylbenzyl)phenyl)(imino)(methyl)-λ6-sulfanone (0.06 g, 68.7 % yield) as a viscous liquid.

Step 8: Synthesis of N'-(2,5-dimethyl-4-(4-(methylsulfinyl)benzyl)phenyl)-N-ethyl-N-methylformimidamide



To a mixture of (4-(4-amino-2,5-dimethylbenzyl)phenyl)(imino)(methyl)-λ6-sulfanone (80 mg, 0.277 mmol) in trimethyl orthoformate (10 mL), p-toluenesulfonic acid monohydrate (catalytic amount) was added and heated at 100 °C for 3 h. After completion of reaction, the volatiles were evaporated to give the intermediate. This intermediate was dissolved in 1,4-dioxane (15 mL) and N-ethylmethylamine (0.3 mL, 3.11 mmol) was added. The reaction mixture was heated for 2 h. After completion of the reaction, the reaction mixture was evaporated to give the crude compound which was purified by column chromatography to provide N'-(2,5-dimethyl-4-(4-(methylsulfinyl)benzyl)phenyl)-N-ethyl-N-methylformimidamide (45 mg, 0.126 mmol, 45% yield) as a semisolid.

Step 9: Synthesis of N-ethyl-N'-(4-(4-(N-ethyl-S-methylsulfonimidoyl)benzyl)-2,5-dimethylphenyl)-N-methylformimidamide



To mixture of N'-(2,5-dimethyl-4-(4-(S-methylsulfonimidoyl)benzyl)phenyl)-N-ethyl-N-methylformimidamide (0.2 g, 0.559 mmol) in N,N-dimethylformamide (10 mL), potassium tert-butoxide (0.188 g, 1.678 mmol) was added in portions at 0 °C. To resulting suspension, ethyl iodide (0.14 mL, 1.678 mmol) was added dropwise and reaction mixture was stirred for 2 h. After completion of reaction, the reaction mixture was quenched by crushed ice, extracted with ethyl acetate (2 x 50 mL), washed with brine (3 x 50 mL). The organic layer was separated, dried over anhydrous sodium sulphate and evaporated to get a N-ethyl-N'-(4-(4-(N-ethyl-S-methylsulfonimidoyl)benzyl)-2,5-dimethylphenyl)-N-methylformimidamide (80 mg, 0.207 mmol, 37.1 % yield) as a semisolid.

The following compounds illustrated in Table III were prepared according to the process described in General Scheme 1-24 or example 1-16 using appropriate reactants:

Table III:

Sr. No.	Compound Name	Analytical Data
1	N-((3-((3-bromo-5-(((ethyl(methyl)amino)methylene)amino)-6-methylpyridin-2-yl)oxy)phenyl)(methyl)(oxo)-λ^6-sulfaneylidene)cyclobutanecarboxamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.89 (s, 1H), 7.78-7.67 (m, 3H), 7.51 (s, 1H), 7.39-7.36 (m, 1H), 3.49-3.33 (m, 5H), 3.09-2.94 (m, 4H), 2.24 (s, 3H), 2.12-1.99 (m, 4H), 1.90-1.83 (m, 1H), 1.74-1.68 (m, 1H), 1.11-1.17 (m, 3H); LCMS (M+H):508.3
2	N'-(2-chloro-4-(N-cyano-S-phenylsulfinimidoyl)-5-methylphenyl)-N-ethyl-N-methylformimidamide	LCMS (M+1): 359.2
3	N'-(2-chloro-4-(N-cyanophenylsulfonimidoyl)-5-methylphenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 8.12 (s, 1H), 8.03-8.00 (m, 3H), 7.84 (t, 1H), 7.73 (t, 2H), 7.12 (d, 1H), 3.49-3.29 (m, 2H), 2.99 (s, 3H), 2.24 (s, 3H), 1.19-1.12 (m, 3H); LCMS (M+1): 374.8
4	N'-(2,5-dimethyl-4-((methyl(oxo)(phenyl)-λ^6-sulfaneylidene)amino)phenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.94-7.90 (m, 2H), 7.68-7.58 (m, 3H), 7.53-7.43 (m, 1H), 6.64 (s, 1H), 6.48 (s, 1H), 3.45 (s, 3H), 3.29 (s, 3H), 2.86 (s, 2H), 2.18 (s, 3H), 1.95 (s, 3H), 1.07 (t, 3H); LCMS (M+1): 343.8
5	N-((5-chloro-4-(((ethyl(methyl)amino)methylene)amino)-2-methylphenyl)(phenyl)-l4-sulfaneylidene)-2,2,2-trifluoroacetamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 8.22 (m, 1H), 7.92 (s 1H), 7.83 (s, 1H), 7.47-7.17 (m, 1H), 7.08-7.03 (m, 1H), 3.90 (s, 3H), 3.50 (s, 3H), 3.41-3.32 (m, 2H), 2.98 (s, 3H), 2.47 (s, 3H), 1.19-1.12 (m, 3H)

6	N'-(2-chloro-5-methyl-4-((methyl(oxo)(phenyl)-λ^6-sulfaneylidene)amino)phenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.88-7.77 (m, 2H), 7.11-7.06 (m, 2H), 6.96 (d, 1H), 6.82-6.77 (m, 3H), 3.42-3.34 (m, 2H), 2.95 (s, 3H), 2.48 (s, 3H), 1.91 (s, 3H), 1.17-1.09 (m, 3H)
7	N'-(2-chloro-4-(3-(N,S-dimethylsulfonimidoyl)phenoxy)-5-methylphenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.64-7.54 (m, 3H), 7.23-7.20 (m, 2H), 6.80 (s, 1H), 6.74 (s, 1H), 3.38-3.21 (m, 5H), 2.93 (bs, 3H), md, 1H), 1.14-1.11 (m, 3H)
8	N'-(2-chloro-4-(3-(N-cyanopropan-2-ylsulfonimidoyl)phenoxy)-5-methylphenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.73- 7.56 (m, 2H), 7.43 (d, 1H), 7.21-7.18 (m, 1H), 7.05 (t, 1H), 6.78 (s, 1H), 6.74 (s, 1H), 3.43-3.32 (m, 2H), 3.12 (t, 2H), 2.93 (s, 2H), 2.86-2.78 (m, 1H), 2.72-2.64 (m, 1H), 2.12 (s, 3H), 2.01 (s, 3H), 1.55-1.49 (m, 1H), 1.46-1.39 (m, 1H), 1.33-1.25 (m, 1H), 1.23 (d, 1H), 1.13 (t, 3H), 0.98 (t, 3H), 0.79-0.76 (m, 6H)
9	N'-(2-chloro-5-methyl-4-(3-(S-methyl-N-phenylsulfonimidoyl)phenoxy)phenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.66-7.64 (m, 3H), 7.34 (d, 1H), 7.24-7.21 (m, 1H), 6.80 (s, 1H), 6.75 (s, 1H), 3.53 (s, 3H), 3.36-3.32 (m, 2H), 2.93 (s, 3H), 2.13 (s, 3H), 2.02 (s, 3H), 1.13 (t, 3H)
10	N-((3-(5-chloro-4-(((ethyl(methyl)amino)methylene)amino)-2-methylphenoxy)phenyl)(isopropyl)(oxo)-λ^6-sulfaneylidene)-2,2,2-trifluoroacetamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.58 (t, 2H), 7.43 (d, 1H), 7.20 (d, 1H), 7.04 (s, 1H), 6.76 (d, 2H), 3.62-3.37 (m, 2H), 3.15-3.11 (m, 2H), 2.93 (s, 3H), 2.70-2.55 (m, 2H), 2.12 (s, 3H), 2.01 (s, 3H), 1.56-1.49 (m, 1H), 1.44-1.39 (m, 1H), 1.32-1.23 (m, 2H), 1.17-1.10 (m, 3H), 0.79-0.77 (m, 6H), 0.28 (d, 2H), 0.04--0.02 (m, 2H)
11	N-((3-(5-chloro-4-(((ethyl(methyl)amino)methylene)amino)-2-methylphenoxy)phenyl)(methyl)(oxo)-λ^6-sulfaneylidene)-2,2,2-trifluoroacetamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.67-7.54 (m, 2H), 7.45-7.43 (m, 1H), 7.15-7.11 (m, 2H), 6.78 (d, 1H), 6.73 (s, 1H), 3.45-3.32 (m, 2H), 3.07 (s, 3H), 2.92 (s, 3H), 2.41 (s, 3H), 2.12 (s, 3H), 2.01 (s, 3H), 1.14-1.08 (m, 3H)
12	N'-(2-chloro-4-(3-(N-cyano-S-methylsulfonimidoyl)phenoxy)-5-methylphenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.76-7.64 (m, 3H), 7.34-7.30 (m, 2H), 6.84 (s, 1H), 6.76 (s, 1H), 3.86-3.79 (m, 2H), 3.36 (s, 2H), 2.93 (s, 3H), 2.14 (s, 3H), 2.03 (s, 3H), 1.19-1.12 (m, 6H)
13	N'-(2-chloro-4-(3-(N-ethyl-S-(trifluoromethyl)sulfonimidoyl)phenoxy)-5-methylphenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.74-7.68 (m, 3H), 7.41 (t, 1H), 7.29-7.27 (m, 1H), 6.83 (s, 1H), 6.76 (s, 1H), 3.73 (s, 3H), 3.44-3.32 (m, 2H), 2.93 (s, 3H), 2.14 (s, 3H), 2.04 (s, 3H), 1.15-1.11 (m, 3H)
14	N'-(2-chloro-4-(3-(N-ethyl-S-methylsulfonimidoyl)phenoxy)-5-methylphenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.72-7.58 (m, 2H), 7.51 (d, 1H), 7.24 (t, 1H), 7.17-7.14 (m, 1H), 6.77 (d, 2H), 3.83 (m, 2H), 3.41-3.36 (m, 2H), 3.27 (s, 3H), 2.93 (s, 3H), 2.13 (s, 3H), 2.04 (s, 3H), 1.13 (t, 3H)
15	N'-(4-(S-benzyl-N-cyanosulfinimidoyl)-2-chloro-5-methylphenyl)-N-ethyl-N-methylformimidamide	LCMS (M+1): 374.2

16	N-((5-chloro-4-(((ethyl(methyl)amino)methylene)amino)-2-methylphenyl)(methyl)(oxo)-λ^6-sulfaneylidene)-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 8.22 (m, 1H), 7.92 (s 1H), 7.83 (s, 1H), 7.47-7.17 (m, 1H), 7.08-7.03 (m, 1H), 3.90 (s, 3H), 3.50 (s, 3H), 3.41-3.32 (m, 2H), 2.98 (s, 3H), 2.47 (s, 3H), 1.19-1.12 (m, 3H); LCMS (M+1): 446.2
17	N'-(2-chloro-5-methyl-4-(S-methyl-N-phenylsulfonimidoyl)phenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.88-7.77 (m, 2H), 7.11-7.06 (m, 2H), 6.96 (d, 1H), 6.82-6.77 (m, 3H), 3.42-3.34 (m, 2H), 2.95 (s, 3H), 2.48 (s, 3H), 1.91 (s, 3H), 1.17-1.09 (m, 3H); LCMS (M+1): 364.1
18	N'-(2-chloro-4-(3-(N-(cyclopropylmethyl)-S-methylsulfonimidoyl)phenoxy)-5-methylphenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.79-7.75 (b, 1H), 7.6 (t, 1H), 7.54-7.50 (d, 1H), 7.22-7.16 (m, 2H), 7.06 (s, 1H), 7.02-6.97 (m, 1H), 3.50-3.33 (m, 2H), 3.07 (s, 3H), 3.03-2.87 (b, 3H), 2.68 (q, 1H), 2.58 (q, 1H), 2.03 (s, 3H), 1.14 (t, 3H), 0.87-0.83 (m, 1H), 0.33-0.29 (m, 2H), 0.06-0.02 (m, 2H); LCMS (M+H): 435.9
19	N'-(2-chloro-5-methyl-4-(3-(S-methyl-N-(pyridin-2-yl)sulfonimidoyl)phenoxy)phenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.91 (d, 1H), 7.68 (br, 1H), 7.58-7.50 (m, 3H), 7.27 (s, 1H), 7.13 (d, 1H), 6.77-6.71 (m, 4H), 3.41 (m, 5H), 2.93 (s, 3H), 2.04 (s, 3H), 1.13 (t, 3H); LCMS (M+H): 437.6
20	N'-(2-chloro-4-(3-(S-(cyclopropylmethyl)-N-ethylsulfonimidoyl)phenoxy)-5-methylphenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.79-7.75 (bs, 1H), 7.6 (t, 1H), 7.50 (dd, 1H), 7.26-7.20 (m, 2H), 7.06 (m, 1H), 6.97-7.02 (b d, 1H), 3.15 (m, 2H), 3.03-2.87 (b d, 5H), 2.85 (q, 6.3 Hz, 1H), 2.75 (q, 1H), 2.03 (s, 3H), 1.14 (t, 3H), 1.0 (t, 3H), 0.83-0.87 (m, 2H), 0.4-0.3 (m, 2H), 0.03-0.01 (m, 2H); LCMS (M+H):448.5
21	N'-(4-(3-(N-benzyl-S-methylsulfonimidoyl)phenoxy)-2-chloro-5-methylphenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) 7.79-7.75 (b, 1H), 7.61- 7.54 (m, 2H),), 7.29-7.16 (m, 7H), 7.09 (s, 1H), 7.02-6.97 (m, 1H), 4.05-3.9 (m, 2 H), 3.85-3.8 (m, 2H), 3.2 (s, 3H), 3.03-2.92 (bs, 3H), 2.06 (s, 3H), 1.14 (t, 3H), LCMS (M+H): 471.95
22	N'-(2-chloro-4-(N-(3,5-difluorophenyl)-S-methylsulfonimidoyl)-5-methylphenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.86 (t, 2H), 7.02 (d, 1H), 6.66-6.58 (m, 1H), 6.46-6.37 (m, 2H), 3.51-3.42 (m, 3H), 3.42-3.37 (m, 2H), 2.95 (s, 3H), 2.48 (s, 3H), 1.19-1.08 (m, 3H) LCMS (M+H) : 400.8
23	N'-(2-chloro-5-methyl-4-(S-methyl-N-(3,4,5-trifluorophenyl)sulfonimidoyl)phenyl)-N-ethyl-N-methylformimidamide ;	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.86 (t, 2H), 7.03 (d, 1H), 6.67-6.58 (m, 2H), 3.50-3.47 (s, 2H), 3.43-3.41 (m, 3H), 2.98 (s, 3H), 2.49 (s, 3H), 1.19-1.10 (m, 3H); LCMS (M+H) : 418.8
24	N'-(2-chloro-4-(N-(3-methoxyphenyl)-S-methylsulfonimidoyl)-5-methylphenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.91-7.86 (m, 1H), 7.78 (s, 1H), 6.98-6.95 (m, 2H), 6.42-6.34 (m, 3H), 3.61 (s, 3H), 3.54-3.42 (m, 2H), 3.42-3.36 (m, 3H), 2.95 (s, 3H), 2.48 (s, 3H), 1.17-1.10 (m, 3H) LCMS (M+H): 394.4

25	N'-(2-chloro-4-(3-(N-ethyl-3-methylbutylsulfonimidoyl)phenoxy)-5-methylphenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) 7.79-7.75 (d, 1H), 7.6 (t, 1H), 7.50 (dd, 1H), 7.26-7.20 (m, 1H), 7.1 (m, 1H), 7.06 (s, 1H), 7.02-6.97 (bd, 1H), 3.16-3.12 (t, 2H), 3.02-2.92 (b d, 3H), 2.88-2.78 (m, 2H), 2.72-2.68 (m, 1H), 2.06 (s, 3H), 1.58-1.38 (m, 2H), 1.32-1.22 (m, 2H), 1.10 (s, 3H), 1.0 (s, 3H), 0.78-.74 (m, 6H); LCMS (M+H):464.55
26	N'-(2-chloro-4-(3-(N-(cyclopropylmethyl)-3-methylbutylsulfonimidoyl)phenoxy)-5-methylphenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) 7.79-7.75 (d, 1H), 7.6 (t, 1H), 7.50 (dd, 1H),), 7.26-7.20 (m, 1H), 7.1 (m, 1H), 7.06 (s, 1H), 6.97-7.02 (d, 1H), 3.16-3.12 (t, 2H), 3.02 (s, 3H), 2.88-2.78 (m, 2H), 2.72-2.55 (m, 2H), 2.04 (s, 3H), 1.54-1.41 (m, 2H), 1.32-1.22 (m, 2H), 1.10-1.19 (m, 3H), 0.78 (d, 6H) 0.29-0.33 (m, 2H), 0.02-0.06 (m, 2H); LCMS (M+H):491.35
27	N'-(4-(N-(3,5-bis(trifluoromethyl)phenyl)-S-methylsulfonimidoyl)-2-chloro-5-methylphenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.91 (s, 1H), 7.80 (s, 1H), 7.51-7.44 (m, 1H), 7.35-7.30 (m, 2H), 7.06-6.98 (m, 1H), 3.53 (s, 3H), 3.48-3.40 (m, 2H), 2.98 (s, 3H), 2.47 (s, 3H), 1.16-1.10 (m, 3H) LCMS (M+H): 500.9
28	N-((5-chloro-4-(((ethyl(methyl)amino)methylene)amino)-2-methylphenyl)(methyl)(oxo)-λ^6-sulfaneylidene)benzamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 8.00-7.98 (m, 2H), 7.94 (s, 1H), 7.85 (s, 1H), 7.59-7.54 (m, 1H), 7.48-7.44 (m, 2H), 7.10-7.03 (m, 1H), 3.57 (s, 3H), 3.54-3.36 (m, 2H), 2.99 (s, 3H), 2.48 (s, 3H), 1.19-1.12 (m, 3H) LCMS (M+H): 392.2
29	3-chloro-N-((5-chloro-4-(((ethyl(methyl)amino)methylene)amino)-2-methylphenyl)(methyl)(oxo)-λ^6-sulfaneylidene)-4-fluorobenzamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 8.12-8.09 (m, 1H), 8.01-7.93 (m, 2H), 7.85 (d, 1H), 7.52 (t, 1H), 7.07 (d, 1H), 3.59 (s, 3H), 3.53-3.36 (m, 2H), 2.99 (s, 3H), 2.47 (s, 3H), 1.19-1.12 (m, 3H); LCMS (M+H):444.5
30	N-((5-chloro-4-(((ethyl(methyl)amino)methylene)amino)-2-methylphenyl)(methyl)(oxo)-λ^6-sulfaneylidene)-3-(trifluoromethyl)benzamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 8.30-8.23 (m, 2H), 7.99-7.92 (m, 2H), 7.90-7.82 (m,1H), 7.74 (t, 1H), 7.08 (m, 1H), 3.62 (s, 3H), 3.54-3.36 (m, 2H), 2.99 (s, 3H), 2.48 (s, 3H), 1.19-1.12 (m, 3H); LCMS (M+H): 459.8
31	N-((5-chloro-4-(((ethyl(methyl)amino)methylene)amino)-2-methylphenyl)(methyl)(oxo)-λ^6-sulfaneylidene)-3,5-bis(trifluoromethyl)benzamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 8.53-8.50 (m, 2H), 8.38 (s, 1H), 7.98-7.83 (m, 2H), 7.09 (d, 1H), 3.67 (s, 3H), 3.54-3.36 (m, 2H), 2.96 (s, 3H), 2.48 (s, 3H), 1.19-1.12 (m, 3H); LCMS (M+H): 527.8
32	N-((3-((3-bromo-5-(((ethyl(methyl)amino)methylene)amino)-6-methylpyridin-2-yl)oxy)phenyl)(methyl)(oxo)-λ^6-sulfaneylidene)acetamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.89-7.87 (m, 1H), 7.75-7.74 (m, 3H), 7.58 (t, 1H), 7.37-7.34 (m, 1H), 3.46 (s, 3H), 3.37-3.33 (m, 2H), 3.02-2.94 (m, 3H), 2.25 (s, 3H), 1.96 (s, 3H), 1.19-1.11 (m, 3H); LCMS (M+H): 468.5
33	3,5-dichloro-N-((5-chloro-4-(((ethyl(methyl)amino)methylene)amino)-2-methylphenyl)(methyl)(oxo)-λ^6-sulfaneylidene)benzamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.93 (s, 1H), 7.89 (t, 2H), 7.84-7.82 (m, 2H), 7.06 (d, 1H), 3.59 (s, 3H), 3.52-3.34 (m, 2H), 2.94 (s, 3H), 2.45 (s, 3H), 1.17-1.11 (m, 3H); LCMS (M+H): 460.8

34	N-((5-chloro-4-(((ethyl(methyl)amino)methylene)amino)-2-methylphenyl)(methyl)(oxo)-λ^6-sulfaneylidene)-3,4-difluorobenzamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.80-7.91 (m, 4H), 7.58-7.41 (m, 1H), 7.04 (d, 1H), 3.55 (s, 3H), 3.50-3.32 (m, 2H), 2.95 (s, 3H), 2.44 (s, 3H), 1.15-1.05 (m, 3H); LCMS (M+H): 427.9
35	N-((5-chloro-4-(((ethyl(methyl)amino)methylene)amino)-2-methylphenyl)(methyl)(oxo)-λ^6-sulfaneylidene)-3-methoxybenzamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.94 (s, 1H), 7.88-7.82 (m, 1H), 7.61-7.56 (m, 1H), 7.50-7.47 (m, 1H), 7.37 (t, 1H), 7.16-7.10 (m, 1H), 7.10-7.02 (m, 1H), 3.78 (s, 3H), 3.56 (s, 3H), 3.53-3.35 (m, 2H), 2.98 (s, 3H), 2.48 (s, 3H), 1.18-1.14 (m, 3H); LCMS (M+H):422.9
36	N'-(2-chloro-5-methyl-4-(S-methyl-N-(3-(trifluoromethyl)phenyl)sulfonimidoyl)phenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.94-7.76 (m, 2H), 7.33-7.30 (m, 1H), 7.18-7.10 (m, 1H), 7.07-7.04 (m, 2H), 7.02-6.95 (m, 1H), 3.44 (s, 3H), 3.41-3.33 (m, 2H), 2.94 (s, 3H), 2.47 (s, 3H), 1.19-1.09 (m, 3H); LCMS (M+H):432.1
37	N-((5-chloro-4-(((ethyl(methyl)amino)methylene)amino)-2-methylphenyl)(methyl)(oxo)-λ^6-sulfaneylidene)-3-(trifluoromethoxy)benzamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 8.05-7.98 (m, 1H), 7.95 (s, 1H), 7.87-7.84 (m, 2H), 7.65-7.58 (m, 2H), 7.13-7.02 (m, 1H), 3.56 (s, 3H), 3.55-3.36 (m, 2H), 2.96 (s, 3H), 2.48 (s, 3H), 1.19-1.12 (m, 3H); LCMS (M+H): 475.8
38	N'-(5-bromo-2-methyl-6-(3-(S-methylsulfonimidoyl)phenoxy)pyridin-3-yl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.89 (s, 1H), 7.77-7.68 (m, 2H), 7.60 (t, 1H), 7.49-7.50 (m, 1H), 7.29-7.27 (m, 1H), 4.29 (s, 1H), 3.49-3.43 (m, 2H), 3.07 (s, 3H), 3.01-2.93 (m, 3H), 2.23 (s, 3H), 1.19-1.12 (m, 3H); LCMS (M+H):426.3
39	N-((5-chloro-4-(((ethyl(methyl)amino)methylene)amino)-2-methylphenyl)(methyl)(oxo)-λ^6-sulfaneylidene)-3-fluorobenzamide	^{1}H-NMR (400 MHz, CHLOROFORM-D) δ 8.11 (s, 1H), 7.96-7.88 (m, 1H), 7.85-7.78 (m, 1H), 7.46-7.43 (m, 1H), 7.41-7.33 (m, 1H), 7.22-7.16 (m, 1H), 6.80-6.74 (1H), 3.50-3.40 (m, 3H), 3.41-3.30 (m, 2H), 3.00 (s, 3H), 2.56 (s, 3H), 1.33-1.22 (m, 3H); LCMS (M+H): 409.2
40	3-chloro-N-((5-chloro-4-(((ethyl(methyl)amino)methylene)amino)-2-methylphenyl)(methyl)(oxo)-λ^6-sulfaneylidene)benzamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.99-7.90 (m, 2H), 7.88-7.82 (m, 1H), 7.68-7.62 (m, 2H), 7.51 (t, 1H), 7.11-7.03 (m, 1H), 3.67-3.56 (m, 3H), 3.53-3.36 (m, 2H), 2.96 (s, 3H), 2.47 (s, 3H), 1.19-1.12 (m, 3H); LCMS (M+H): 426.4
41	N'-(2-chloro-4-(N-(4-chloro-3-(trifluoromethyl)phenyl)-S-methylsulfonimidoyl)-5-methylphenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.93-7.86 (m, 1H), 7.79 (s, 1H), 7.41 (d, 1H), 7.20-7.14 (m, 1H), 7.04-6.99 (m, 2H), 3.54-3.42 (m, 3H), 3.42-3.36 (m, 2H), 2.95 (s, 3H), 2.46 (s, 3H), 1.17-1.10 (m, 3H); LCMS (M+H): 466.4
42	N'-(5-bromo-6-(3-(N-ethyl-S-methylsulfonimidoyl)phenoxy)-2-methylpyridin-3-yl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.89 (s, 1H), 7.78-7.70 (m, 1H), 7.65-7.59 (m, 2H), 7.38-7.36 (m, 1H), 7.34-7.31 (m, 1H), 3.46-3.34 (m, 2H), 3.11 (s, 3H), 3.01 (s, 3H), 2.87-2.82 (m, 1H), 2.75-2.71 (m, 1H), 2.22 (s, 3H), 1.19-1.11 (m, 3H), 1.01 (t, 3H); LCMS (M+H):454.4

43	N-((5-chloro-4-(((ethyl(methyl)amino)methylene)amino)-2-methylphenyl)(methyl)(oxo)-λ^6-sulfaneylidene)-3-methylbenzamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.97-7.88 (s 1H), 7.88-7.75 (m, 3H), 7.42-7.29 (m, 2H), 7.11-7.01 (m, 1H), 3.63-3.53 (m, 3H), 3.53-3.35 (m, 2H), 2.96 (s, 3H), 2.47 (s, 3H), 2.35 (s, 3H), 1.22-1.12 (m, 3H); LCMS (M+H): 405.9
44	N'-(2-chloro-5-methyl-4-(S-methyl-N-(4-(pentafluoro-λ^6-sulfaneyl)phenyl)sulfonimidoyl)phenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.90 (d, 1H), 7.80 (s, 1H), 7.63-7.59 (m, 2H), 7.06-6.96 (m, 1H), 6.91 (d, 2H), 3.50-3.42 (m, 3H), 3.42-3.34 (m, 2H), 2.96 (s, 3H), 2.46 (s, 3H), 1.19-1.10 (m, 3H); LCMS (M+H): 489.10
45	N'-(2-chloro-5-methyl-4-(S-methyl-N-(3-(pentafluoro-λ^6-sulfaneyl)phenyl)sulfonimidoyl)phenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.90 (d, 1H), 7.79 (s, 1H), 7.34-7.27 (m, 2H), 7.21 (d, 1H), 7.05-6.98 (m, 2H), 3.51-3.42 (m, 3H), 3.41-3.35 (m, 2H), 2.95 (s, 3H), 2.46 (s, 3H), 1.19-1.10 (m, 3H); LCMS (M+H): 490.1
46	N-((3-((3-bromo-5-(((ethyl(methyl)amino)methylene)amino)-6-methylpyridin-2-yl)oxy)phenyl)(methyl)(oxo)-λ^6-sulfaneylidene)-2,2,2-trifluoroacetamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.90 (s, 1H), 7.81-7.68 (m, 4H), 7.48-7.46 (m, 1H), 3.81 (s, 3H), 3.49-3.36 (m, 2H), 3.02-2.94 (m, 3H), 2.23 (s, 3H), 1.17-1.10 (m, 3H); LCMS (M+H):522.3
47	N'-(5-bromo-2-methyl-6-((methyl(oxo)(phenyl)-λ^6-sulfaneylidene)amino)pyridin-3-yl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 8.03-8.01 (m, 2H), 7.68-7.65 (m, 4H), 7.40 (s, 1H), 3.45-3.42 (m, 3H), 3.32 (s, 2H), 2.95 (s, 3H), 2.06 (s, 3H), 1.08 (t, 3H), LCMS (M+H): 409.3
48	N'-(2-chloro-5-methyl-4-(3-(S-methyl-N-(prop-2-yn-1-yl)sulfonimidoyl)phenoxy)phenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, CHLOROFORM-D): δ 7.61-7.41 (m, 4H), 7.12 (dd, 1H), 6.99 (s, 1H), 6.86 (s, 1H), 3.71-3.62 (m, 2H), 3.37-3.35 (s, 2H), 3.16-3.04 (m, 6H), 2.09 (s, 3H), 2.05 (t, 1H), 1.24 (m, 3H); LCMS (M+H):418.9
49	N'-(5-bromo-2-methyl-6-(3-(S-methyl-N-(2,2,2-trifluoroethyl)sulfonimidoyl)phenoxy)pyridin-3-yl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.89 (s, 1H), 7.78-7.74 (m, 1H), 7.70-7.63 (m, 2H), 7.46-7.44 (m, 1H), 7.39-7.36 (m, 1H), 3.53-3.34 (m, 4H), 3.30 (s, 3H), 3.01 (s, 3H), 2.20 (s, 3H), 1.19-1.10 (m, 3H); LCMS (M+H):508.4
50	N-((5-chloro-4-(((ethyl(methyl)amino)methylene)amino)-2-methylphenyl)(ethyl)(oxo)-λ^6-sulfaneylidene)-3-methoxybenzamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 8.00-7.82 (m, 1H), 7.82-7.78 (m, 1H), 7.62-7.59 (m, 1H), 7.52-7.47 (m, 1H), 7.38 (t, 1H), 7.15-7.12 (m, 1H), 7.07 (d, 1H), 3.77 (s, 3H), 3.74 (q, 1H), 3.60 (q, 1H), 3.53-3.36 (m, 2H), 2.93 (s ,3H), 2.45 (s, 3H), 1.23-1.13 (m, 6H); LCMS (M+H):436.0
51	N-((5-chloro-4-(((ethyl(methyl)amino)methylene)amino)-2-methylphenyl)(ethyl)(oxo)-λ^6-sulfaneylidene)-3-(trifluoromethyl)benzamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 8.33-8.25 (m, 2H), 7.96 (d, 2H), 7.83 (d, 1H), 7.74 (t, 1H), 7.08 (d, 1H), 3.85-3.78 (m, 1H), 3.703.63 (m, 1H), 3.58-3.37 (m, 2H), 2.95 (s, 3H), 2.45 (s, 3H), 1.23-1.12 (m, 6H); LCMS (M+H): 473.94; LCMS (M+H): 474.1
52	N-((5-chloro-4-(((ethyl(methyl)amino)methylene)amino)-2-methylphenyl)(ethyl)(oxo)-λ^6-sulfaneylidene)-3-fluorobenzamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.95 (s, 1H), 7.88-7.82 (m, 1H), 7.80 (s, 1H), 7.70 (d, 1H), 7.53 (d, 1H), 7.45-7.41 (m, 1H), 7.07 (d, 1H), 3.76 (q, 1H), 3.61 (q, 1H), 3.55-3.36 (m, 2H), 2.96 (s, 3H), 2.45 (s, 3H), 1.24-1.12 (m, 6H) LCMS (M+H): 424.2

53	N-((5-chloro-4-(((ethyl(methyl)amino)methylene)amino)-2-methylphenyl)(ethyl)(oxo)-λ^6-sulfaneylidene)-3-(trifluoromethoxy)benzamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 8.03 (d, 1H), 7.96 (s, 1H), 7.86 (d, 1H), 7.81 (s, 1H), 7.65-7.61 (m, 2H), 7.08 (d, 1H), 3.79 (q, 1H), 3.64 (q, 1H), 3.56-3.35 (m, 2H), 2.96 (s, 3H), 2.45 (s, 3H), 1.23-1.13 (m, 6H); LCMS (M+H): 490.2
54	N-ethyl-N'-(4-(3-(N-ethyl-S-methylsulfonimidoyl)phenoxy)-2,5-dimethylphenyl)-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.73-7.63 (s,1H), 7.59-7.55 (t, 1H), 7.47 (d, 1H), 7.16-7.12 (d, 2H), 6.80 (s, 1H), 6.74 (s, 1H), 3.39-3.21 (m, 2H), 3.08 (s, 3H), 2.93 (s, 3H), 2.87-2.61 (m, 2H), 2.13 (s, 3H), 2.02 (s, 3H), 1.15-1.10 (t, 3H), 0.99 (t, 3H); LCMS (M+H):388.4
55	N-ethyl-N'-(4-((isopentyl(oxo)(phenyl)-λ^6-sulfaneylidene)amino)-2,5-dimethylphenyl)-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.86-7.84 (m, 2H), 7.63 (m, 3H), 7.49 (bs, 1H), 6.61 (s, 1H), 6.49 (s, 1H), 3.40 (t, 2H), 3.29-3.25 (m, 2H) 2.86 (s, 3H), 2.20 (s, 3H), 1.91 (s, 3H), 1.61-1.38 (m, 3H), 1.07 (t, 3H), 0.80 (q, 6H); LCMS (M+H):400.1
56	N'-(5-bromo-6-(((4-bromophenyl)(methyl)(oxo)-λ^6-sulfaneylidene)amino)-2-methylpyridin-3-yl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.95-7.81 (d, 4H), 7.68-7.01 (m, 1H), 7.38 (s, 1H), 3.40-3.28 (m, 2H), 3.45-3.42 (m, 3H), 3.00-2.80 (d, 3H), 2.10- 2.01 (s, 3H), 1.10-1.06 (t, 3H); LCMS (M+H): 489.0
57	N'-(5-bromo-6-((isopentyl(oxo)(phenyl)-λ^6-sulfaneylidene)amino)-2-methylpyridin-3-yl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 8.00-7.98 (m, 2H), 7.74-7.62 (m, 4H), 7.42 (s, 1H), 3.85-3.77 (m, 1H), 3.68-3.61 (m, 1H), 3.40-3.32 (m, 2H), 2.95-2.86 (m, 3H), 2.07 (s, 3H), 1.59-1.52 (m, 1H), 1.42-1.34 (m, 2H), 1.11 (s, 3H), 0.78-0.73 (m, 6H); LCMS (M+H): 465.4
58	N-((5-chloro-4-(((ethyl(methyl)amino)methylene)amino)-2-methylphenyl)(ethyl)(oxo)-λ^6-sulfaneylidene)benzamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 8.01-7.99 (m, 2H), 7.95 (s, 1H), 7.82 (d, 1H), 7.57 (t, 1H), 7.46 (t, 2H), 7.07 (d, 1H), 3.74 (q, 1H), 3.59 (q, 1H), 3.53-3.34 (m, 2H), 2.96 (s, 3H), 2.45 (s, 3H), 1.22-1.12 (m, 6H); LCMS (M+H): 406.2
59	N-((5-chloro-4-(((ethyl(methyl)amino)methylene)amino)-2-methylphenyl)(ethyl)(oxo)-λ^6-sulfaneylidene)-4-(difluoromethyl)-1-methyl-1H-pyrazole-3-carboxamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 8.24 (s, 1H), 8.00-7.84 (m, 1H), 7.76 (s, 1H), 7.32 (t, 1H), 7.07 (d, 1H), 3.90 (s, 3H), 3.74-3.36 (m, 4H), 2.96 (s, 3H), 2.44 (s, 3H), 1.19-1.06 (m, 6H) LCMS (M+H):460.2
60	N'-(2-chloro-5-methyl-4-(N-(3-(trifluoromethyl)phenyl)ethylsulfonimidoyl)phenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.91 (s, 1H), 7.81 (d, 1H), 7.31 (t, 1H), 7.18-7.09 (m, 3H), 6.99 (d, 1H), 3.63-3.34 (m, 4H), 2.96 (s, 3H), 2.45 (s, 3H), 1.22-1.11 (m, 6H); LCMS (M+H):446.2
61	N'-(2-chloro-5-methyl-4-(N-(3-(trifluoromethoxy)phenyl)ethylsulfonimidoyl)phenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.90-7.79 (m, 2H), 7.19 (t, 1H), 6.99 (d, 1H), 6.82-6.74 (m, 3H), 3.61-3.38 (m, 4H), 2.96 (s, 3H), 2.45 (s, 3H), 1.20-1.10 (m, 6H); LCMS (M+H): 462.2
62	N'-(2-chloro-5-methyl-4-(N-(3,4,5-trifluorophenyl)ethylsulfonimidoyl)phenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.93 (s, 1H), 7.81 (s, 1H), 7.03 (d, 1H), 6.63 (d, 2H), 3.62-3.32 (m, 4H), 2.96 (s, 3H), 2.46 (s, 3H), 1.18-1.10 (m, 6H); LCMS (M+H):431.90

63	N'-(2-chloro-5-methyl-4-(N-(m-tolyl)ethylsulfonimidoyl)phenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.89 (s, 1H), 7.80 (d, 1H), 6.98-6.93 (m, 2H), 6.67 (s, 1H), 6.60 (d, 2H), 3.61-3.34 (m, 4H), 2.95 (s, 3H), 2.46 (s, 3H), 2.14 (s, 3H), 1.17-1.10 (m, 6H); LCMS (M+H): 392.4
64	N'-(2-chloro-5-methyl-4-(N-phenylethylsulfonimidoyl)phenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.89 (s, 1H), 7.80 (d, 1H), 7.12-7.03 (m, 2H), 6.96 (d, 1H), 6.83-6.76 (m, 3H), 3.62-3.35 (m, 4H), 2.96 (s, 3H), 2.46 (s, 3H), 1.19-1.11 (m, 6H); LCMS (M+H): 378.2
65	N'-(4-(3-(N-(cyclopropylmethyl)-S-methylsulfonimidoyl)phenoxy)-2,5-dimethylphenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.66 (s, 1H), 7.57 (t, 1H), 7.47 (d, 1H), 7.12-7.17 (m, 2H), 6.79 (s, 1H), 6.73 (s, 1H), 3.50-3.37 (m, 2H), 3.08 (s, 3H), 2.93 (s, 3H), 2.70-2.53 (m, 2H), 2.13 (s, 3H), 2.02 (s, 3H), 1.13 (t, 3H), 0.82-0.75 (m, 1H), 0.29 (m, 2H), 0.05-0.03 (m, 2H); LCMS (M+H): 413.8
66	N-ethyl-N'-(4-((isopropyl(oxo)(phenyl)-λ^6-sulfaneylidene)amino)-2,5-dimethylphenyl)-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.77-7.75 (m, 2H), 7.69-7.65 (m, 1H), 7.62-7.58 (m, 2H), 7.48 (s, 1H), 6.57 (s, 1H), 6.50 (s, 1H), 3.57-3.50 (m, 1H), 3.29 (m, 2H), 2.86 (s, 3H), 2.23 (s, 3H), 1.89 (s, 3H), 1.29-1.17 (m, 6H), 1.07 (t, 3H); LCMS (M+H): 372.4
67	N-((3-(4-(((ethyl(methyl)amino)methylene)amino)-2,5-dimethylphenoxy)phenyl)(methyl)(oxo)-λ^6-sulfaneylidene)cyclobutanecarboxamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.64-7.54 (m, 3H), 7.23-7.20 (m, 2H), 6.80 (s, 1H), 6.74 (s, 1H), 3.38-3.21 (m, 5H), 2.93 (bs, 3H), md, 1H), 1.14-1.11 (m, 3H)
68	N-((3-((3-bromo-5-(((ethyl(methyl)amino)methylene)amino)-6-methylpyridin-2-yl)oxy)phenyl)(methyl)(oxo)-λ^6-sulfaneylidene)pivalamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.89 (s, 1H), 7.78-7.64 (m, 3H), 7.48 (s, 1H), 7.40-7.36 (m, 1H), 3.48-3.35 (m, 5H), 2.96 (m, 3H), 2.23 (s, 3H), 1.07-1.04 (m, 12H); LCMS (M+H):510.5
69	N'-(5-bromo-6-(3-(N-(cyclobutylmethyl)-S-methylsulfonimidoyl)phenoxy)-2-methylpyridin-3-yl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.89 (s, 1H), 7.78-7.70 (m, 1H), 7.65-7.58 (m, 2H), 7.34-7.32 (m, 2H), 3.46-3.35 (m, 2H), 3.11 (s, 3H), 3.01-2.93 (m, 3H), 2.77-2.80 (m, 1H), 2.62-2.67 (m, 1H), 2.33-2.28 (m, 1H), 2.23 (s, 3H), 1.92-1.84 (m, 2H), 1.79-1.69 (m, 2H), 1.63-1.51 (m, 2H), 1.17-1.10 (m, 3H); LCMS (M+H):493.5
70	N'-(5-bromo-2-methyl-6-(3-(S-methyl-N-neopentylsulfonimidoyl)phenoxy)pyridin-3-yl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.88 (s, 1H), 7.77-7.70 (m, 1H), 7.65-7.57 (m, 2H), 7.35-7.31 (m, 2H), 3.46-3.46 (m, 2H), 3.13 (s, 3H), 2.93 (s, 3H), 2.55 (d, 1H), 2.33 (d, 1H), 2.23 (s, 3H), 1.17-1.11 (m, 3H), 0.83-0.80 (m, 9H); LCMS (M+H): 496.5
71	N'-(4-(3-(N-(cyclobutylmethyl)-S-methylsulfonimidoyl)phenoxy)-2,5-dimethylphenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.67 (br, 1H), 7.57 (t, 1H), 7.46 (d, 1H), 7.18-7.16 (m, 1H), 7.11 (t, 1H), 6.80 (s, 1H), 6.73 (s, 1H), 3.38 (s, 2H), 3.06 (s, 3H), 2.96 (s, 3H), 2.78-2.75 (m, 1H), 2.60-2.58 (m, 1H), 2.24-2.33 (m, 1H), 2.13 (s, 3H), 1.99 (s, 3H), 1.90-1.83 (m, 2H), 1.79-1.66 (m, 2H), 1.61-1.49 (m, 2H), 1.15 (t, 3H); LCMS (M+H): 427.8

72	3-chloro-N-((5-chloro-4-(((ethyl(methyl)amino)methylene)amino)-2-methylphenyl)(isobutyl)(oxo)-λ^6-sulfaneylidene)-4-fluorobenzamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 8.13-8.06 (m, 1H), 8.01-7.93 (m, 2H), 7.83 (d, 1H), 7.52 (t, 1H), 7.07 (d, 1H), 3.56-3.35 (m, 4H), 2.96 (m, 3H), 2.44 (s, 3H), 2.23-2.17 (m, 1H), 1.18-1.14 (m, 3H), 1.11-1.08 (m, 3H), 0.95 (d, 3H); LCMS (M+H):486.4
73	N-((3-((3-bromo-5-(((ethyl(methyl)amino)methylene)amino)-6-methylpyridin-2-yl)oxy)phenyl)(methyl)(oxo)-λ^6-sulfaneylidene)cyclopropanecarboxamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.89 (s, 1H), 7.78-7.75 (m, 1H), 7.71-7.64 (m, 2H), 7.53-7.52 (m, 1H), 7.37-7.34 (m, 1H), 3.49-3.39 (m, 5H), 3.01-2.94 (m, 3H), 2.24 (s, 3H), 1.64-1.56 (m, 1H), 1.10 (s, 3H), 0.75-0.71 (m, 4H); LCMS (M+H): 494.4
74	N-ethyl-N'-(4-(((3-methoxyphenyl)(methyl)(oxo)-λ^6-sulfaneylidene)amino)-2,5-dimethylphenyl)-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.47-7.54 (m, 3H), 7.39 (t, 1H), 7.21 (dq, 1H), 6.66 (s, 1H), 6.49 (s, 1H), 3.80 (s, 3H), 3.27-3.29 (5H), 2.89 (s, 3H), 2.18 (s, 3H), 1.94 (s, 3H), 1.08 (t, 3H); LCMS (M+H):374.2
75	N-ethyl-N'-(4-((isopropyl(3-methoxyphenyl)(oxo)-λ^6-sulfaneylidene)amino)-2,5-dimethylphenyl)-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.54-7.49 (m, 2H), 7.32 (dd, 1H), 7.24-7.21 (m, 2H), 6.60 (s, 1H), 6.50 (s, 1H), 3.79 (s ,3H), 3.52-3.59 (m, 1H), 3.32-3.23 (m, 2H), 2.86 (s, 3H), 2.22 (s, 3H), 1.89 (s, 3H), 1.33 (s, 3H), 1.21-1.18 (m, 3H), 1.07 (t, 3H); LCMS (M+H): 402.1
76	N-ethyl-N'-(4-((isopentyl(3-methoxyphenyl)(oxo)-λ^6-sulfaneylidene)amino)-2,5-dimethylphenyl)-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.60-7.45 (m, 2H), 7.45-7.38 (m, 1H), 7.36-7.29 (m, 1H), 7.26-7.18 (m, 1H), 6.64 (s, 1H), 6.54-6.46 (m, 1H), 3.79 (s, 3H), 3.48-3.38 (m, 2H), 3.33-3.25 (m, 2H), 2.96-2.79 (s,3H), 2.20 (s, 3H), 1.92 (s, 3H), 1.69-1.38 (m, 3H), 1.08 (t, 3H), 0.81 (q, 6H); LCMS (M+H): 430.6
77	N'-(5-bromo-6-((isopentyl(3-methoxyphenyl)(oxo)-λ^6-sulfaneylidene)amino)-2-methylpyridin-3-yl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.75-7.65 (m, 1H), 7.57-7.54 (m, 3H), 7.43 (s, 1H), 7.29-7.28 (m, 1H), 3.87-3.80 (m, 4H), 3.71-3.60 (m, 1H), 3.39-3.32 (m, 2H), 2.97-2.88 (m, 3H), 2.10 (s, 3H), 1.59-1.52 (m, 1H), 1.39-1.27 (m, 2H), 1.10 (s, 3H), 0.77 (d, 6H); LCMS (M+H):495.6
78	N'-(5-bromo-6-((isopropyl(3-methoxyphenyl)(oxo)-λ^6-sulfaneylidene)amino)-2-methylpyridin-3-yl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.72 (s, 1H), 7.53 (t, 1H), 7.39-7.36 (m, 2H), 7.34-7.32 (m, 1H), 7.26-7.23 (m, 1H), 3.81 (m, 4H), 3.46-3.32 (m, 2H), 2.95-2.82 (m, 3H), 1.98 (s, 3H), 1.33 (d, 3H), 1.15 (s, 3H), 1.10 (s, 3H); LCMS (M+H): 467.4
79	N'-(5-bromo-6-(((4-chlorophenyl)(isopropyl)(oxo)-λ^6-sulfaneylidene)amino)-2-methylpyridin-3-yl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.80 (d, 2H), 7.70 (d, 2H), 7.60-7.35 (m, 2H), 3.80-3.77 (m, 1H), 3.36-3.28 (m, 2H), 2.97-2.83 (m, 3H), 1.94 (s, 3H), 1.34 (d, 3H), 1.15 (d, 3H), 1.11-1.05 (m, 3H); LCMS (M+H): 471.8
80	N'-(5-bromo-6-(((4-chlorophenyl)(oxo)(propyl)-λ^6-sulfaneylidene)amino)-2-methylpyridin-3-yl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.95-7.91 (m, 2H), 7.72-7.69 (m, 2H), 7.64-7.37 (m, 2H), 3.71-3.57 (m, 2H), 3.38-3.26 (m, 2H), 2.95 (s, 3H), 2.02 (s, 3H), 1.65-1.46 (m, 2H), 1.09 (d, 3H), 0.91-0.85 (m, 3H); LCMS (M+H): 471.8

81	N'-(5-bromo-6-(((4-chlorophenyl)(methyl)(oxo)-λ^6-sulfaneylidene)amino)-2-methylpyridin-3-yl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 8.01 (d, 2H), 7.71 (d, 2H), 7.61 (s, 1H), 7.40 (s, 1H), 3.40-3.24 (m, 2H), 2.97 (s, 3H), 2.05 (s, 3H), 1.30-1.22 (m, 3H), 1.10-1.06 (m, 3H); LCMS (M+H): 443.8
82	N'-(5-bromo-6-(((4-chlorophenyl)(isopentyl)(oxo)-λ^6-sulfaneylidene)amino)-2-methylpyridin-3-yl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.97 (d, 2H), 7.74-7.38 (m, 3H), 7.42-7.36 (m, 1H), 3.83-3.75 (m, 1H), 3.69-3.67 (m, 1H), 3.42-3.46 (m, 2H), 3.01-2.89 (m, 3H), 2.05 (s, 3H), 1.61-1.55 (m, 1H), 1.47-1.39 (m, 1H), 1.35-1.25 (m, 1H), 1.12-1.07 (m, 3H), 0.80-0.75 (m, 6H); LCMS (M+H): 500.1
83	N'-(2-chloro-4-(N-(3-chloro-4-fluorophenyl)-2-methylpropylsulfonimidoyl)-5-methylphenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.91 (s, 1H), 7.82 (d, 1H), 7.13 (t, 1H), 7.00 (d, 1H), 6.94-6.88 (m, 1H), 6.81-6.72 (m, 1H), 3.53-3.35 (m, 4H), 2.94 (s, 3H), 2.47 (s, 3H), 2.25-2.15 (m, 1H), 1.19-1.10 (m, 3H), 1.08-1.05 (m, 3H), 0.93 (d, 3H); LCMS (M+H): 458.4
84	N'-(2-chloro-4-(N-(3-methoxyphenyl)-2-methylpropylsulfonimidoyl)-5-methylphenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.87 (d, 1H), 7.78 (s, 1H), 6.98-6.95 (m, 2H), 6.41-6.34 (m, 3H), 3.60 (s, 3H), 3.50-3.25 (m, 4H), 2.94 (s, 3H), 2.47 (s, 3H), 2.26-2.14 (m, 1H), 1.19-1.10 (m, 3H), 1.08-1.04 (m, 3H), 0.98-0.86 (m, 3H); LCMS (M+H):436.2
85	N'-(4-(N-(3,5-bis(trifluoromethyl)phenyl)-2-methylpropylsulfonimidoyl)-2-chloro-5-methylphenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.91 (d, 1H), 7.81 (s, 1H), 7.44 (s, 1H), 7.32 (s, 2H), 7.02 (d, 1H), 3.64-3.35 (m, 4H), 2.95 (s ,3H), 2.46 (s, 3H), 2.29-2.21 (m, 1H), 1.18-1.11 (m, 3H), 1.08 (d, 3H), 0.96 (d, 3H); LCMS (M+H):542.02
86	N'-(2-chloro-5-methyl-4-(2-methyl-N-phenylpropylsulfonimidoyl)phenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.87 (d, 1H), 7.77 (s, 1H), 7.11-7.04 (m, 2H), 6.96 (d, 1H), 6.82-6.75 (m, 3H), 3.51-3.24 (m, 4H), 2.96 (s, 3H), 2.47 (s, 3H), 2.23-2.17 (m, 1H), 1.16-1.09 (m, 3H), 1.06 (d, 3H), 0.92 (d, 3H); LCMS (M+H):406.01
87	N'-(5-bromo-6-(((3-methoxyphenyl)(methyl)(oxo)-λ^6-sulfaneylidene)amino)-2-methylpyridin-3-yl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.60-7.43 (m, 5H), 7.27-7.24 (m, 1H), 3.84 (s, 3H), 3.51 (s, 3H), 3.40-3.26 (m, 2H), 3.02-2.83 (m, 3H), 2.10 (s, 3H), 1.15-1.10 (m, 3H); LCMS (M+H):439.4
88	N'-(2-chloro-4-(N-(3-chloro-4-fluorobenzyl)-S-methylsulfonimidoyl)-5-methylphenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.85 (d, 1H), 7.77 (s, 1H), 7.51 (d, 1H), 7.31 (d, 2H), 7.03 (d, 1H), 3.99 (d, 1H), 3.82 (d, 1H), 3.52-3.35 (m, 2H), 3.23 (s, 3H), 2.95 (s, 3H), 2.42 (s, 3H), 1.18-1.12 (m, 3H); LCMS (M+H):430.3
89	N'-(2-chloro-4-(N-(3-methoxybenzyl)-S-methylsulfonimidoyl)-5-methylphenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.90 (s, 1H), 7.80 (s, 1H), 7.18 (t, 1H), 7.03 (d, 1H), 6.88 (d, 2H), 6.75 (d, 1H), 3.98 (d 1H), 3.78 (d, 1H), 3.72 (s, 3H), 3.52-3.36 (m, 2H), 3.21 (s, 3H), 2.95 (s, 3H), 2.43 (s, 3H), 1.19-1.12 (m, 3H); LCMS (M+H): 408.01
90	N'-(2-chloro-4-(N-(3-chlorobenzyl)-S-methylsulfonimidoyl)-5-methylphenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.90 (s, 1H), 7.80 (s, 1H), 7.18 (t, 1H), 7.03 (d, 1H), 6.88 (d, 2H), 6.75 (d, 1H), 3.98 (d, 1H), 3.78 (d, 1H), 3.52-3.36 (m, 2H), 3.21 (s, 3H), 2.95 (s, 3H), 2.43 (s, 3H), 1.19-1.12 (m, 3H); LCMS (M+H):412.4

91	N'-(2-chloro-5-methyl-4-(S-methyl-N-(3-(trifluoromethyl)benzyl)sulfonimidoyl)phenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.90 (s, 1H), 7.79 (s, 1H), 7.69 (s, 1H), 7.67-7.62 (m, 1H), 7.56-7.49 (m, 2H), 7.08-7.03 (m, 1H), 4.10 (d, 1H), 3.93 (d, 1H), 3.49-3.37 (m, 2H), 3.25 (s, 3H), 2.95 (s, 3H), 2.43 (s, 3H), 1.19-1.12 (m, 3H); LCMS (M+H): 446.01
92	N'-(2-chloro-5-methyl-4-(S-methyl-N-(3-(trifluoromethoxy)benzyl)sulfonimidoyl)phenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.90 (s, 1H), 7.79 (s, 1H), 7.69 (s, 1H), 7.62 (d, 1H), 7.56-7.49 (m, 2H), 7.03 (d, 1H), 4.10 (d, 1H), 3.93 (d, 1H), 3.49-3.37 (m, 2H), 3.25 (s, 3H), 2.95 (s, 3H), 2.43 (s, 3H), 1.19-1.12 (m, 3H); LCMS (M+H):462.1
93	N-ethyl-N'-(4-(3-(N-ethyl-3-methylbutylsulfonimidoyl)phenoxy)-2,5-dimethylphenyl)-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.73- 7.56 (m, 2H), 7.43 (d, 1H), 7.21-7.18 (m, 1H), 7.05 (t, 1H), 6.78 (s, 1H), 6.74 (s, 1H), 3.43-3.32 (m, 2H), 3.12 (t, 2H), 2.93 (s, 2H), 2.86-2.78 (m, 1H), 2.72-2.64 (m, 1H), 2.12 (s, 3H), 2.01 (s, 3H), 1.55-1.49 (m, 1H), 1.46-1.39 (m, 1H), 1.33-1.25 (m, 1H), 1.23 (d, 1H), 1.13 (t, 3H), 0.98 (t, 3H), 0.79-0.76 (m, 6H);
94	N'-(2,5-dimethyl-4-(3-(S-methyl-N-(trifluoromethyl)sulfonimidoyl)phenoxy)phenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.66-7.64 (m, 3H), 7.34 (d, 1H), 7.24-7.21 (m, 1H), 6.80 (s, 1H), 6.75 (s, 1H), 3.53 (s, 3H), 3.36-3.32 (m, 2H), 2.93 (s, 3H), 2.13 (s, 3H), 2.02 (s, 3H), 1.13 (t, 3H);
95	N'-(4-(3-(N-(cyclopropylmethyl)-3-methylbutylsulfonimidoyl)phenoxy)-2,5-dimethylphenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.58 (t, 2H), 7.43 (d, 1H), 7.20 (d, 1H), 7.04 (s, 1H), 6.76 (d, 2H), 3.62-3.37 (m, 2H), 3.15-3.11 (m, 2H), 2.93 (s, 3H), 2.70-2.55 (m, 2H), 2.12 (s, 3H), 2.01 (s, 3H), 1.56-1.49 (m, 1H), 1.44-1.39 (m, 1H), 1.32-1.23 (m, 2H), 1.17-1.10 (m, 3H), 0.79-0.77 (m, 6H), 0.28 (d, 2H), 0.04--0.02 (m, 2H);
96	N'-(2,5-dimethyl-4-(3-(S-methyl-N-(2,2,2-trifluoroethyl)sulfonimidoyl)phenoxy)phenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.67 (br, 1H), 7.60 (t, 1H), 7.50 (d, 1H), 7.22 (t, 1H), 7.15-7.18 (m, 1H), 6.80 (s, 1H), 6.74 (s, 1H), 3.51-3.42 (m, 2H), 3.28-3.23 (m, 5H), 2.93 (s, 3H), 2.13 (s, 3H), 2.03 (s, 3H), 1.13 (t, 3H); LCMS (M+H):442.3
97	N'-(2,5-dimethyl-4-(3-(S-methyl-N-(pyridin-2-yl)sulfonimidoyl)phenoxy)phenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.91 (d, 1H), 7.68 (bs, 1H), 7.58-7.50 (m, 3H), 7.27 (s, 1H), 7.13 (d, 1H), 6.77-6.71 (m, 4H), 3.45-3.39 (m, 5H), 2.93 (s, 3H), 2.10 (s, 3H), 1.98 (s, 3H), 1.13 (t, 3H); LCMS (M+H): 436.6
98	N'-(2,5-dimethyl-4-(3-(S-methyl-N-phenylsulfonimidoyl)phenoxy)phenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.68 (s, 1H), 7.56-7.53 (m, 2H), 7.22 (d, 1H), 7.15-7.12 (m, 1H), 7.08 (t, 2H), 6.83-6.52 (m, 5H), 3.41-3.35 (m, 5H), 2.94 (s, 3H), 2.12 (s, 3H), 1.92 (s, 3H), 1.14 (t, 3H); LCMS (M+H): 436.5
99	N'-(4-(3-(N,S-dimethylsulfonimidoyl)phenoxy)-2,5-dimethylphenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.67-7.54 (m, 2H), 7.45-7.43 (m, 1H), 7.15-7.11 (m, 2H), 6.78 (d, 1H), 6.73 (s, 1H), 3.45-3.32 (m, 2H), 3.07 (s, 3H), 2.92 (s, 3H), 2.41 (s, 3H), 2.12 (s, 3H), 2.01 (s, 3H), 1.14-1.08 (m, 3H); LCMS (M+1):

100	N'-(2-chloro-4-(N-(3-chloro-4-fluorobenzyl)-2-methylpropylsulfonimidoyl)-5-methylphenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.92 (s, 1H), 7.39 (s, 1H), 7.33-7.23 (m, 3H), 7.03 (d, 1H), 4.02 (d, 1H), 3.83 (d, 1H), 3.48 (q, 1H), 3.40 (q, 1H), 3.31-3.16 (m, 2H), 2.95 (s, 3H), 2.45 (s, 3H), 2.21-2.11 (m, 1H), 1.18-1.11 (m, 3H), 1.04 (d, 3H), 0.92 (d, 3H); ; LCMS (M+H):472.5
101	N'-(2-chloro-4-(N-(3-chlorobenzyl)-2-methylpropylsulfonimidoyl)-5-methylphenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.92 (s, 1H), 7.76 (s, 1H), 7.39 (s, 1H), 7.33-7.23 (m, 3H), 7.03 (d, 1H), 4.02 (d, 1H), 3.83 (d, 1H), 3.48 (q, 1H), 3.40 (q, 1H), 3.31-3.16 (m, 2H), 2.96 (s, 3H), 2.44 (s, 3H), 2.21-2.11 (m, 1H), 1.18-1.12 (m, 3H), 1.04 (d, 3H), 0.92 (d, 3H); LCMS (M+H):454.4
102	N'-(2-chloro-5-methyl-4-(2-methyl-N-(3-(trifluoromethyl)benzyl)propylsulfonimidoyl)phenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.91 (s, 1H), 7.78 (d, 1H), 7.71 (s, 1H), 7.63-7.47 (m, 3H), 7.03 (d, 1H), 4.11 (d, 1H), 3.93 (d, 1H), 3.52-3.16 (m, 4H), 2.96 (s, 3H), 2.46 (s, 3H), 2.21-2.14 (m, 1H), 1.18-1.12 (m, 3H), 1.05 (d, 3H), 0.93-0.89 (m, 3H); LCMS (M+H):488.01
103	N'-(4-(N-benzyl-S-methylsulfonimidoyl)-2-chloro-5-methylphenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.91 (s, 1H), 7.80 (s, 1H), 7.32-7.24 (m, 4H), 7.20-7.17 (m, 1H), 7.03 (d, 1H), 4.01 (d, 1H), 3.80 (d, 1H), 3.49-3.37 (m, 2H), 3.20 (s, 3H), 2.95 (s, 3H), 2.52 (s, 3H), 1.18-1.12 (m, 3H); LCMS (M+H):378.01
104	N'-(5-bromo-6-(3-(N-isopentyl-S-methylsulfonimidoyl)phenoxy)-2-methylpyridin-3-yl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.89 (s, 1H), 7.78-7.70 (m, 1H), 7.65-7.58 (m, 2H), 7.36-7.31 (m, 2H), 3.46-3.36 (m, 2H), 3.12 (s, 3H), 2.96 (s, 3H), 2.85-2.78 (m, 1H), 2.68-2.62 (m, 1H), 2.54 (s, 1H), 2.27 (m, 3H), 1.67-1.60 (m, 1H), 1.25-1.20 (m, 1H), 1.19-1.10 (m, 3H), 0.80-0.77 (q, 6H); LCMS (M+H):496.4
105	N'-(5-bromo-2-methyl-6-(3-(S-methyl-N-(2-(tetrahydro-2H-pyran-4-yl)ethyl)sulfonimidoyl)phenoxy)pyridin-3-yl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.89 (s, 1H), 7.78-7.71 (m, 1H), 7.65-7.59 (m, 2H), 7.36-7.31 (m, 2H), 3.78-3.71 (m, 2H), 3.46-3.41 (m, 2H), 3.25-3.21 (m, 2H), 3.13 (s, 3H), 2.95 (m, 3H), 2.87-2.81 (m, 1H), 2.70-2.63 (m, 1H), 2.23 (s, 3H), 1.59-1.56 (m, 1H), 1.50-1.46 (m, 1H), 1.40-1.37 (m, 1H), 1.33-1.28 (m, 2H), 1.23 (s, 1H), 1.17-1.09 (m, 3H), 0.98-1.07 (m, 2H); LCMS (M+H): 536.5
106	N'-(5-bromo-6-(((cyclopropylmethyl)(3-fluorophenyl)(oxo)-λ^6-sulfaneylidene)amino)-2-methylpyridin-3-yl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 8.06-8.03 (m, 2H), 7.74 (s, 1H), 7.51-7.43 (m, 2H), 7.43 (s, 1H), 3.79-3.75 (m, 1H), 3.63-3.60 (m, 1H), 3.41-3.29 (m, 2H), 2.99-2.84 (m, 3H), 2.08 (s, 3H), 1.10 (s, 3H), 0.85-0.76 (m, 1H), 0.41-0.35 (m, 2H), 0.03-0.02 (m, 2H); LCMS (M+H): 467.4
107	N'-(5-bromo-6-(((cyclopropylmethyl)(4-fluorophenyl)(oxo)-λ^6-sulfaneylidene)amino)-2-methylpyridin-3-yl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.84-7.67 (m, 4H), 7.65-7.60 (m, 1H), 7.43 (s, 1H), 3.78-3.76 (m, 1H), 3.69-3.66 (m, 1H), 3.45-3.29 (m, 2H), 3.00-2.85 (m, 3H), 2.06 (s, 3H), 1.11 (s, 3H), 0.85-0.80 (m, 1H), 0.42-0.32 (m, 2H), 0.07-0.05 (m, 2H); LCMS (M+H): 467.7

108	N-((3-((3-bromo-5-(((ethyl(methyl)amino)methylene)amino)-6-methylpyridin-2-yl)oxy)phenyl)(methyl)(oxo)-λ^6-sulfaneylidene)-3-methylbutanamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.90 (s, 1H), 7.78-7.64 (m, 3H), 7.53 (s, 1H), 7.38-7.35 (m, 1H), 3.45 (s, 3H), 3.38-3.36 (m, 2H), 2.94-3.01 (m, 3H), 2.24 (s, 3H), 2.108-2.08 (m, 2H), 1.99-1.91 (m, 2H), 1.19-1.11 (m, 2H), 0.84-0.83 (m, 6H); LCMS (M+H):510.4
109	N-((3-((3-bromo-5-(((ethyl(methyl)amino)methylene)amino)-6-methylpyridin-2-yl)oxy)phenyl)(methyl)(oxo)-λ^6-sulfaneylidene)-2-(tetrahydro-2H-pyran-4-yl)acetamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.89 (s, 1H), 7.78-7.56 (m, 1H), 7.71-7.64 (m, 2H), 7.54 (s, 1H), 7.37 (m, 1H), 3.79-3.72 (m, 2H), 3.46 (s, 3H), 3.39-3.36 (m, 1H), 3.26-3.19 (m, 2H), 3.01-2.93 (m, 3H), 2.24 (s, 3H), 2.15 (d, 2H), 1.91-1.84 (m, 1H), 1.55-1.47 (m, 2H), 1.19-1.10 (m, 6H); LCMS (M+H):552.4
110	N'-(2-chloro-4-(N-(4-(dimethylamino)phenyl)-2-methylpropylsulfonimidoyl)-5-methylphenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.86 (d, 1H), 7.77 (s, 1H), 6.94 (d, 1H), 6.70 (d, 2H), 6.51 (d, 2H), 3.50-3.29 (m, 4H), 2.96 (s, 3H), 2.73 (s, 6H), 2.47 (s, 3H), 2.22-2.12 (m, 1H), 1.18-1.12 (m, 3H), 1.05 (d, 3H), 0.90 (d, 3H); LCMS (M+H):449.5
111	N'-(2-chloro-4-(N-(4-methoxyphenyl)-2-methylpropylsulfonimidoyl)-5-methylphenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.86 (d, 1H), 7.77 (s, 1H), 6.95 (d, 1H), 6.75 (d, 2H), 6.67 (d, 2H), 3.61 (s, 3H), 3.51-3.36 (m, 4H), 3.07-2.89 (m, 3H), 2.48 (s, 3H), 2.23-2.13 (m, 1H), 1.17-1.11 (m, 3H), 1.05 (d, 3H), 0.91 (d, 3H); LCMS (M+H):436.01
112	N'-(2-chloro-4-(N-(3-(dimethylamino)phenyl)-2-methylpropylsulfonimidoyl)-5-methylphenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.88 (d, 1H), 7.77 (s, 1H), 6.95 (d, 1H), 6.88-6.81 (m, 1H), 6.22-6.12 (m, 3H), 3.50-3.35 (m, 4H), 2.96 (s, 3H), 2.74 (s, 6H), 2.47 (s, 3H), 2.24-2.14 (m, 1H), 1.16-1.12 (m, 3H), 1.06 (d, 3H), 0.92 (d, 3H); LCMS (M+H): 449.05
113	N'-(2-chloro-5-methyl-4-(2-methyl-N-(4-morpholinophenyl)propylsulfonimidoyl)phenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.86 (d, 1H), 7.77 (s, 1H), 6.95 (d, 1H), 6.73-6.67 (m, 4H), 3.66 (m, 4H), 3.49-3.35 (m, 4H), 2.97 (s, 3H), 2.91 (m, 4H), 2.47 (s, 3H), 2.22-2.12 (m, 1H), 1.16-1.09 (m, 3H), 1.05 (d, 3H), 0.91 (d, 3H); LCMS (M+H):491.09
114	N'-(2-chloro-5-methyl-4-(2-methyl-N-(thiophen-3-yl)propylsulfonimidoyl)phenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.90 (s, 1H), 7.81 (d, 1H), 7.29-7.22 (m, 1H), 6.98 (d, 1H), 6.67 (d, 1H), 6.34 (d, 1H), 3.51-3.34 (m, 4H), 2.96 (s, 3H), 2.48 (s, 3H), 2.24-2.14 (m, 1H), 1.16-1.10 (m, 3H), 1.05 (d, 3H), 0.92 (d, 3H); LCMS (M+H):412.01
115	N'-(2-chloro-5-methyl-4-(2-methyl-N-(3,4,5-trimethoxyphenyl)propylsulfonimidoyl)phenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.90 (d, 1H), 7.79 (s, 1H), 6.98 (d, 1H), 6.09 (s, 2H), 3.58 (s, 6H), 3.51 (s, 3H), 3.49-3.34 (m, 4H), 2.95 (s, 3H), 2.46 (s, 3H), 2.24-2.18 (m, 1H), 1.16-1.10 (m, 3H), 1.06 (d, 3H), 0.93 (d, 3H); LCMS (M+H): 496.06
116	N'-(4-(3-(N-cyanoethylsulfonimidoyl)phenoxy)-2,5-dimethylphenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.76-7.64 (m, 3H), 7.34-7.30 (m, 2H), 6.84 (s, 1H), 6.76 (s, 1H), 3.86-3.79 (m, 2H), 3.36 (s, 2H), 2.93 (s, 3H), 2.14 (s, 3H), 2.03 (s, 3H), 1.19-1.12 (m, 6H); LCMS (M+1):

117	N'-(4-(3-(N-cyano-S-methylsulfonimidoyl)phenoxy)-2,5-dimethylphenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.74-7.68 (m, 3H), 7.41 (t, 1H), 7.29-7.27 (m, 1H), 6.83 (s, 1H), 6.76 (s, 1H), 3.73 (s, 3H), 3.44-3.32 (m, 2H), 2.93 (s, 3H), 2.14 (s, 3H), 2.04 (s, 3H), 1.15-1.11 (m, 3H); LCMS (M+1):
118	N'-(2-chloro-5-methyl-4-(S-methylsulfonimidoyl)phenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.90 (s, 1H), 7.78-7.71 (m, 1H), 7.66-7.58 (m, 2H), 7.38-7.32 (m, 2H), 3.47-3.45 (m, 2H), 3.11 (s, 3H), 2.94 (s, 3H), 2.46 (s, 3H), 2.23 (s, 3H), 1.18-1.12 (m, 3H); LCMS (M+H):440.4
119	N-((3-((3-bromo-5-(((ethyl(methyl)amino)methylene)amino)-6-methylpyridin-2-yl)oxy)phenyl)(ethyl)(oxo)-λ^6-sulfaneylidene)cyclopropanecarboxamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.89 (s, 1H), 7.77-7.70 (m, 1H), 7.69-7.60 (m, 2H), 7.38-7.42 (m, 2H), 3.60-3.52 (m, 2H), 3.456-3.36 (m, 2H), 2.95 (s, 3H), 2.21 (d, 3H), 1.63-1.57 (m, 1H), 1.18-1.11 (m, 3H), 1.07 (t, 3H), 0.76-0.68 (m, 4H); LCMS (M+H):508.4
120	N-((3-((3-bromo-5-(((ethyl(methyl)amino)methylene)amino)-6-methylpyridin-2-yl)oxy)phenyl)(ethyl)(oxo)-λ^6-sulfaneylidene)pivalamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.89 (s, 1H), 7.75-7.61 (m, 3H), 7.45-7.42 (m, 1H), 7.35 (t, 1H), 3.60 -3.53 (m, 2H), 3.37-3.34 (m, 2H), 2.96 (s, 3H), 2.23 (s, 3H), 1.19-1.11 (m, 6H), 1.07 (s, 9H); LCMS (M+H):524.4
121	N'-(5-bromo-2-methyl-6-(3-(N-neopentylethylsulfonimidoyl)phenoxy)pyridin-3-yl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.88 (s, 1H), 7.77-7.70 (m, 1H), 7.64 (t, 1H), 7.54 (d, 1H), 7.35 (d, 1H), 7.25 (s, 1H), 3.46 -3.29 (m, 2H), 3.26-3.16 (m, 2H), 2.96 (m, 3H), 2.60 -2.55 (m, 1H), 2.22 (s, 3H), 1.35 -1.23 (m, 1H), 1.13 -1.05 (m, 6H), 0.82 (s, 9H); LCMS (M+H): 510.5
122	N'-(5-bromo-6-(3-(N-(cyclobutylmethyl)ethylsulfonimidoyl)phenoxy)-2-methylpyridin-3-yl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.89 (s, 1H), 7.77-7.70 (m, 1H), 7.64 (t, 1H), 7.54 (d, 1H), 7.43-7.34 (m, 1H), 7.26 (s, 1H), 3.46-3.35 (m, 1H), 3.25-3.14 (m, 1H), 2.93 (s, 3H), 2.87-2.80 (m, 1H), 2.71 -2.66 (m, 1H), 2.34 -2.28 (m, 1H), 2.22 (s, 3H), 1.91-1.84 (m, 2H), 1.81-1.52 (m, 4H), 1.35-1.23 (m, 2H), 1.16-1.10 (m, 3H), 1.06-1.01(m, 3H); LCMS (M+H):508.5
123	N-((3-((3-bromo-5-(((ethyl(methyl)amino)methylene)amino)-6-methylpyridin-2-yl)oxy)phenyl)(ethyl)(oxo)-λ^6-sulfaneylidene)cyclobutanecarboxamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.87 (s, 1H), 7.58-7.79 (m, 3H), 7.45-7.43 (m, 2H), 3.50-3.63 (m, 2H), 3.35-3.49 (m, 2H), 2.87-3.09 (m, 3H), 2.22 (s, 3H), 2.12-1.86 (m, 6H), 1.62-1.86 (m, 1H), 1.28-0.98 (m, 6H); LCMS (M+H):522.3
124	N'-(2-chloro-4-(N-(3,4-dimethoxyphenyl)-2-methylpropylsulfonimidoyl)-5-methylphenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.87 (d, 1H), 7.77 (s, 1H), 6.96 (d, 1H), 6.65 (d, 1H), 6.44 (d, 1H), 6.37-6.24 (m, 1H), 3.60 (s, 6H), 3.51-3.35 (m, 4H), 2.96 (s, 3H), 2.47 (s, 3H), 2.25-2.15 (m, 1H), 1.16-1.10 (m, 3H), 1.05 (d, 3H), 0.92 (d, 3H); LCMS (M+H):466.2
125	N'-(4-(3-(N-(cyanomethyl)-S-methylsulfonimidoyl)phenoxy)-2,5-dimethylphenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.72-7.58 (m, 2H), 7.51 (d, 1H), 7.24 (t, 1H), 7.17-7.14 (m, 1H), 6.77 (d, 2H), 3.83 (m, 2H), 3.41-3.36 (m, 2H), 3.27 (s, 3H), 2.93 (s, 3H), 2.13 (s, 3H), 2.04 (s, 3H), 1.13

		(t, 3H); LCMS (M+1): 398.8
126	N'-(2-chloro-4-(4-(N,S-dimethylsulfonimidoyl)phenoxy)-5-methylphenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.79-7.75 (m, 3H), 7.10 (s, 1H), 7.03-6.97 (m, 3H), 3.50-3.32 (m, 2H), 3.07 (s, 3H), 2.98 (s, 3H), 2.45 (s, 3H), 2.04 (s, 3H), 1.14 (t, 3H); LCMS (M+H):394.8
127	N'-(2-chloro-4-(4-(N-(cyclopropylmethyl)-S-methylsulfonimidoyl)phenoxy)-5-methylphenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.80-7.75 (m, 3H), 7.10 (s, 1H), 7.02-6.97 (m, 3H), 3.50-3.33 (m, 2H), 3.07 (s, 3H), 2.97 (s, 3H), 2.68 (q, 1H), 2.58 (q, 1H), 2.03 (s, 3H), 1.14 (t, 3H), 0.87-0.83 (m, 1H), 0.33-0.29 (m, 2H), 0.06-0.02 (m, 2H); LCMS (M+H):434.1
128	N'-(2,5-dimethyl-4-(4-(S-methylsulfonimidoyl)benzyl)phenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.79-7.84 (m, 2H), 7.52-7.65 (m, 1H), 7.31 (d, 2H), 6.90 (d, 1H), 6.56 (s, 1H), 4.09 (s, 1H), 3.86-3.97 (m, 2H), 3.40-3.46 (m, 1H), 3.21-3.31 (m, 1H),3.07-2.98 (m, 3H), 2.87 (s, 3H), 1.99-2.18 (m, 6H), 1.08-1.14 (m, 3H); LCMS (M+1): 357.8
129	N'-(2-chloro-4-(4-(N-cyano-S-methylsulfonimidoyl)phenoxy)-5-methylphenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 8.01 (d, 2H), 7.85-7.61 (d, 1H), 7.18-7.14 (m, 3H), 7.01 (d, 1H), 3.67 (s, 3H), 3.53-3.35 (m, 2H), 2.87 (s, 3H), 2.05 (s, 3H), 1.17 (t, 3H); LCMS (M+H):405.2
130	N-ethyl-N'-(4-(4-(N-ethyl-S-methylsulfonimidoyl)benzyl)-2,5-dimethylphenyl)-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.72 (d, 2H), 7.58 (d, 1H), 7.33 (d, 2H), 6.90 (s, 1H), 6.56 (s, 1H), 3.93 (s, 2H), 3.49-3.32 (1H), 3.29 (s, 1H), 3.05 (s, 3H), 2.89 (d, 3H), 2.76-2.85 (m, 1H), 2.63-2.71 (m, 1H), 2.06 (s, 3 H), 2.10 (s, 3H), 1.10 (t, 3H), 0.99-1.02 (m, 3H); LCMS (M+1): 385.8
131	N'-(4-(4-(N-(cyclopropylmethyl)-S-methylsulfonimidoyl)benzyl)-2,5-dimethylphenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.72 (d, 2H), 7.58 (d, 1H), 7.32 (d, 2H), 6.90 (s, 1H), 6.56 (s, 1H), 3.93 (s, 2H), 3.35 (s, 1H), 3.29 (s, 1H), 3.06 (s, 3H), 2.90 (s, 3H), 2.67 (q, 1H), 2.55 (q, 1H), 2.09 (q, 6H), 1.10 (t, 3H), 0.85-0.81 (m, 1H), 0.33-0.27 (m, 2H), 0.02-0.01 (m, 2H);LCMS (M+1): 412.4
132	N-ethyl-N'-(4-((1-isopropyl-1-oxido-3-oxo-3H-1λ^4-benzo[d]isothiazol-5-yl)amino)-2,5-dimethylphenyl)-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 8.70 (s, 1H), 7.86 (d, 1H), 7.76-7.53 (m, 1H), 6.92-6.88 (m, 2H), 6.79-6.75 (m, 2H), 4.04-3.97 (m, 1H), 3.54-3.35 (m, 2H), 2.93 (s, 3H), 2.13 (s, 3H), 2.06 (s, 3H), 1.30 (d, 3H), 1.21 (d, 3H), 1.13 (t, 3H); LCMS (M+H):412.4
133	N'-(4-(4-(N,S-dimethylsulfonimidoyl)benzyl)-2,5-dimethylphenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.71-7.69 (m, 2H), 7.57 (d, 1H), 7.34 (d, 2H), 6.91 (s, 1H), 6.56 (s, 1H),3.93 (s, 2H), 3.37 (d, 2H), 3.05 (s, 3H), 2.90 (s, 3H), 2.43 (s, 3H), 2.09 (d, 6H), 1.10 (t, 3H); LCMS (M+1): 371.5
134	N'-(2-chloro-5-methyl-4-(4-(S-methyl-N-(trifluoromethyl)sulfonimidoyl)phenoxy)phenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.97-7.93 (m, 2H), 7.81-7.62 (m, 1H),7.17-7.13 (m, 1H), 7.10-7.06 (m, 2H), 6.99 (d, 1H), 3.48 (s, 3H), 3.45-3.35 (m, 2H), 2.90 (s, 3H), 2.03 (s, 3H), 1.14 (t, 3H); LCMS (M+H): 448.5

135	N'-(4-((4-(N-(cyclopropylmethyl)-S-methylsulfonimidoyl)phenyl)(methyl)amino)-2,5-dimethylphenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.78-7.56 (m, 1H), 7.51 (d, 2H), 6.86 (s, 1H), 6.73 (s, 1H), 6.51 (d, 2H), 5.75 (s, 1H), 3.39-3.36 (m, 2H), 3.19 (s, 3H), 2.95 (s, 3H), 2.92 (bs, 2H), 2.60 (dq, 2H), 2.12 (s, 3H), 1.96 (s, 3H), 1.12 (t, 3H), 0.86-0.82 (m, 1H), 0.33-0.28 (m, 2H), 0.05-0.02 (m, 2H); LCMS (M+1): 426.8
136	N'-(2,5-dimethyl-4-(2-(S-methylsulfonimidoyl)benzyl)phenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 8.09-7.93 (m, 1H), 7.67-7.32 (m, 3H), 6.96-6.86 (m, 1H), 6.67 (s, 1H), 6.52 (s, 1H), 4.45-4.30 (m, 3H), 3.47-3.30 (m, 2H), 3.01 (s, 3H), 2.95 (s, 3H), 2.07 (s, 6H), 1.13-1.04 (m, 3H); LCMS (M+1): 357.8
137	N'-(4-(2-(N,S-dimethylsulfonimidoyl)benzyl)-2,5-dimethylphenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.95 (dd, 1H), 7.44-7.52 (m, 3H), 6.96 (d, 1H), 6.65 (d, 2H), 4.40-4.28 (m, 2H),3.30-3.00 (m. 2H), 3.08 (s, 3H), 2.88 (d, 3H), 2.51 (s, 3H), 2.07 (d, 6H), 1.11 (t, 3H); LCMS (M+1): 372.12
138	N'-(4-(2-(N-(cyclopropylmethyl)-S-methylsulfonimidoyl)benzyl)-2,5-dimethylphenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.96 (dd, 1H), 7.43-7.51 (m, 3H), 6.95 (d, 1H), 6.62 (d, 2H), 4.34 (s, 2H), 3.33-3.30 (m, 2H), 3.06 (s, 3H), 2.91 (s, 3H), 2.70 (dq, 2H), 2.08 (s, 3H), 2.04 (s, 3 H), 1.13-1.09 (s, 3H), 1.02-0.79 (m, 1H), 0.35-0.33 (d, 2H), 0.08-0.07 (d, 2H); LCMS (M+1): 412.2
139	N'-(4-((4-(N-(cyclopropylmethyl)-S-methylsulfonimidoyl)phenyl)amino)-2,5-dimethylphenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 8.02 (s, 1H), 7.76-7.52 (1H), 7.49 (d, 2H), 6.89 (s, 1H), 6.64-6.68 (m, 3H), 3.35-3.43 (m, 3H), 3.28 (d, 1H), 2.95-2.92 (m, 5H), 2.55-2.67 (m, 2H), 2.11 (s, 3H), 2.06 (s, 3H), 1.16-1.10 (m, 3H), 0.33-0.29 (m, 2H), 0.06-0.03 (m, 2H); LCMS (M+1): 412.8
140	N-ethyl-N'-(4-((3-(N-ethyl-S-methylsulfonimidoyl)phenyl)amino)-2,5-dimethylphenyl)-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 8.02 (s, 1H), 7.63 (s, 1H), 7.52-7.48 (m, 2H), 6.90 (s, 1H), 6.68-6.64 (m, 3H), 5.74 (s, 1H), 3.37 (d, 2H), 2.96-2.92 (m, 5H), 2.84-2.80 (m, 2H), 2.11 (s, 3H), 2.07 (s, 3H), 1.12 (t, 3H), 1.02 (t, 3H); LCMS (M+1): 386.8
141	N-ethyl-N'-(4-((4-(N-ethyl-S-methylsulfonimidoyl)phenyl)(methyl)amino)-2,5-dimethylphenyl)-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.67 (d, 1H), 7.51 (d, 2H), 6.85 (s, 1H), 6.73 (s, 1H), 6.52 (d, 2H), 3.16 (s, 3H), 2.92 (s, 3H); 2.99 (s, 5H), 2.63-2.82 (m, 2H), 2.11 (s, 3H), 1.96 (s, 3H), 1.12 (t, 3H), 1.00 (t,3H); LCMS (M+1): 400.6
142	N'-(4-((3-(N,S-dimethylsulfonimidoyl)phenyl)(methyl)amino)-2,5-dimethylphenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.69 (s, 1H), 7.33 (t, 1H), 7.01 (d, 1H), 6.86 (s, 1H), 6.82 (s, 1H), 6.72 (s, 1H), 6.66 (d, 1H), 3.38 (d, 2H), 3.17-3.20 (m, 3H), 3.00 (s, 3H), 2.93 (s, 3H), 2.43 (s, 3H), 2.10 (s, 3H), 1.98 (d, 3H), 1.12 (t, 3H); LCMS (M+1): 386.6
143	N'-(2-chloro-5-methyl-4-(3-(S-(trifluoromethyl)sulfonimidoyl)phenoxy)phenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.79-7.68 (m, 3H), 7.45-7.42 (m, 1H), 7.32 (s, 1H), 7.13 (s, 1H), 7.00-6.98 (m, 1H), 6.91 (s, 1H), 3.45-3.35 (m, 2H), 2.93 (s, 3H), 2.02 (s, 3H), 1.16-1.12 (m, 3H); LCMS (M+H): 434.8

144	N'-(2-chloro-4-(3-(N-(cyclopropylmethyl)-S-(trifluoromethyl)sulfonimidoyl)phenoxy)-5-methylphenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.78-7.67 (m, 3H), 7.43-7.42 (m, 1H), 7.32 (s, 1H), 7.13 (s, 1H), 7.00-6.98 (m, 1H), 3.45-3.34 (m, 2H), 3.21-3.19 (m, 2H), 2.93 (s, 3H), 2.02 (s, 3H), 1.22 (s, 1H), 1.18-1.14 (m, 3H), 1.06-1.00 (m, 1H), 0.47-0.41 (m, 2H), 0.23-0.14 (m, 2H); LCMS (M+H): 487.13
145	N-((3-(5-chloro-4-(((ethyl(methyl)amino)methylene)amino)-2-methylphenoxy)phenyl)(trifluoromethyl)-l4-sulfaneylidene)acetamide	-
146	N'-(2-chloro-5-methyl-4-(3-(N-methyl-S-(trifluoromethyl)sulfonimidoyl)phenoxy)phenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.80-7.68 (m, 3H), 7.47-7.43 (m, 1H), 7.30 (s, 1H), 7.14 (s, 1H), 7.02-6.99 (m, 1H), 3.46-3.35 (m, 2H), 3.01-2.94 (m, 6H), 2.02 (s, 3H), 1.18-1.12 (m, 3H); LCMS (M+H): 448.90
147	N'-(2-chloro-5-methyl-4-(2-(S-(trifluoromethyl)sulfonimidoyl)phenoxy)phenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 8.14-8.12 (m, 1H), 7.77-7.66 (m, 2H), 7.35-7.31 (m, 1H), 7.00-6.96 (m, 2H), 6.81-6.78 (m, 1H), 6.75 (s, 1H), 3.45-3.33 (m, 2H), 2.93 (s, 3H), 2.06 (s, 3H), 1.16-1.12 (m, 3H); LCMS (M+H):434.8
148	N'-(2,5-dimethyl-4-(3-(S-(trifluoromethyl)sulfonimidoyl)phenoxy)phenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.73-7.60 (m, 3H), 7.42-7.37 (m, 1H), 7.30-7.28 (m, 1H), 6.86-6.82 (m, 2H), 6.75 (s, 1H), 3.34-3.30 (m, 2H), 2.93 (s, 3H), 2.13 (s, 3H), 1.98 (s, 3H), 1.14-1.10 (m, 3H); LCMS (M+H): 414.13
149	N'-(2-chloro-5-methyl-4-(2-(N-methyl-S-(trifluoromethyl)sulfonimidoyl)phenoxy)phenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 8.12-8.09 (m, 1H), 7.90-7.85 (m, 1H), 7.70 (bs, 1H), 7.41-7.38 (m, 1H), 7.32-7.28 (m, 1H), 6.95 (s, 1H), 6.84 (s, 1H), 3.91 (s, 3H), 3.40-3.31 (m, 2H), 2.93 (s, 3H), 2.22 (s, 3H), 1.14-1.09 (m, 3H); LCMS (M+H): 447.2
150	N'-(2-chloro-4-(2-(N-ethyl-S-(trifluoromethyl)sulfonimidoyl)phenoxy)-5-methylphenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 8.12-8.09 (mz, 1H), 7.78-7.66 (m, 2H), 7.37-7.33 (m, 1H), 7.01-6.98 (m, 1H), 6.91 (s, 1H), 6.85-6.82 (m, 1H), 3.46-3.25 (m, 4H), 2.93 (s, 3H), 2.08 (s, 3H), 1.19-1.12 (m, 6H); LCMS (M+H): 462.3
151	N'-(2,5-dimethyl-4-(3-(N-methyl-S-(trifluoromethyl)sulfonimidoyl)phenoxy)phenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.74-7.70 (m, 3H), 7.43-7.40 (m, 1H), 7.26 (s, 1H), 6.82 (s, 1H), 6.76 (s, 1H), 3.46-3.32 (m, 2H), 3.06-2.86 (m, 6H), 2.12 (s, 3H), 1.98 (s, 3H), 1.14-1.11 (m, 3H); LCMS (M+H): 428.13
152	N'-(2-chloro-4-(2-(N-(cyclopropylmethyl)-S-(trifluoromethyl)sulfonimidoyl)phenoxy)-5-methylphenyl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 8.11-8.08 (m, 1H), 7.77-7.66 (m, 2H), 7.38-7.34 (m, 1H), 7.01-6.98 (m, 1H), 6.91 (s, 1H), 6.84-6.82 (m, 1H), 3.45-3.33 (m, 2H), 3.28-3.23 (m, 1H), 3.19-3.14 (m, 1H), 2.94 (s, 3H), 2.08 (s, 3H), 1.16-1.12 (m, 3H), 1.04-0.97 (m, 1H), 0.42-0.36 (m, 2H), 0.22-0.15 (m, 2H); LCMS (M+H): 488.13

153	N'-(1-benzyl-1-oxido-3-oxo-3H-1λ^4-benzo[d]isothiazol-5-yl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 8.02 (d, 1H), 7.90 (d, 1H), 7.21-7.29 (m, 6H), 7.14 (d, 1H), 5.40 (d, 1H), 5.22 (d, 1H), 3.36-3.47 (m, 2H), 2.98 (d, 3H), 1.07-1.16 (m, 3H); LCMS (M+1): 341.6
154	N'-(1-(4-chlorobenzyl)-1-oxido-3-oxo-3H-1λ^4-benzo[d]isothiazol-5-yl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 8.04 (d, 1H), 7.93 (dd, 1H), 7.33 (d, 2H), 7.29-7.25 (m, 1H), 7.23 (d, 2H), 7.17 (dd, 1H), 5.45 (d, 1H), 5.27 (d,1H), 3.37-3.49 (m, 2H), 2.99 (s, 3H), 1.12 (t, 3H); LCMS (M+1): 375.8
155	N-ethyl-N-methyl-N'-(1-(4-methylbenzyl)-1-oxido-3-oxo-3H-1λ^4-benzo[d]isothiazol-5-yl)formimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 8.08 (s, 1H), 7.91 (dd, 1H), 7.28-7.24 (m, 1H), 7.16 (dd, 1H), 7.10-7.03 (m, 4H), 5.37 (d, 1H), 5.16 (d, 1H), 3.47-3.36 (m, 2H), 2.99 (s, 3H), 2.21 (s, 3H), 1.11 (t, 3H); LCMS (M+H):356.1
156	N'-(1-benzyl-6-chloro-1-oxido-3-oxo-3H-1λ^4-benzo[d]isothiazol-5-yl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 8.34-8.27 (m, 1H), 8.12-8.00 (m, 1H), 7.34-7.21 (m, 6H), 5.46 (d, 1H), 5.33 (d, 1H), 3.56-3.34 (m, 2H), 3.04 (s, 3H), 1.22 (t, 3H); LCMS (M+H): 376.05
157	N'-(1-benzyl-4-chloro-1-oxido-3-oxo-3H-1λ^4 -benzo[d]isothiazol-5-yl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.98 -7.86(m, 2H), 7.40 (dd, 1H), 7.37-7.25 (m, 5H), 5.42 (d, 1H), 5.29 (d, 1H), 3.54-3.34 (m, 2H), 3.04 (s, 3H), 1.20 (t, 3H); LCMS (M+H): 376.10
158	N'-(1-benzyl-1-oxido-3H-1λ^4-benzo[d]isothiazol-5-yl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.91 (s, 1H), 7.71-7.66 (m, 1H), 7.33-7.17 (m, 5H), 7.02 (d, 1H),6.83- 6.79 (m, 1H), 5.05 (dd, 1H), 4.65 (dd, 1H), 4.48 (dd, 1H), 3.92 (dd, 1H), 3.46-3.34 (m, 2H),3.00 (s, 3H), 1.15 (t, 3H); LCMS (M+H):328.15
159	N-ethyl-N'-(1-(4-fluorobenzyl)-1-oxido-3-oxo-3H-1λ^4-benzo[d]isothiazol-5-yl)-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 8.04 (s, 1H), 7.92 (dd, 1H), 7.29-7.24 (m, 3H), 7.17 (dd, 1H), 7.12-7.07 (m, 2H), 5.43 (d, 1H), 5.24 (d, 1H), 3.48-3.43 (m, 2H), 2.99 (s, 3H), 1.11 (t, 3H); LCMS (M+H): 360.10
160	N'-(1-(4-bromobenzyl)-1-oxido-3-oxo-3H-1λ^4-benzo[d]isothiazol-5-yl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 8.11 (s, 1H), 8.02-7.94 (m, 1H), 7.49 (d, 2H), 7.31-7.17 (m, 4H), 5.36 (dd, 1H), 5.28 (d, 1H), 3.51-3.34 (m, 2H), 3.06 (s, 3H), 1.24 (t, 3H); LCMS (M+H): 421.80
161	N'-(4-chloro-1-(4-chlorobenzyl)-1-oxido-3-oxo-3H-1λ^4-benzo[d]isothiazol-5-yl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.97 -7.85(m, 2H), 7.42-7.37 (m, 3H), 7.26 (d, 2H), 5.43 (d, 1H), 5.31 (d, 1H), 3.53-3.41 (m, 2H), 3.07-2.98 (s, 3H), 1.19-1.12 (t, 3H); LCMS (M+H): 409.95
162	N'-(6-chloro-1-(4-chlorobenzyl)-1-oxido-3-oxo-3H-1λ^4-benzo[d]isothiazol-5-yl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 8.34 (s, 1H), 8.08 (d, 1H), 7.40-7.36(m, 3H), 7.25 (d, 2H), 5.50 (d, 1H), 5.38 (d, 1H), 3.54-3.34 (m, 2H), 3.04 (s, 3H), 1.16 (t, 3H); LCMS (M+H): 410.0
163	N'-(4-chloro-1-(4-fluorobenzyl)-1-oxido-3-oxo-3H-1λ^4-benzo[d]isothiazol-5-yl)-N-ethyl-N-methylformimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 7.98-7.87 (m, 2H), 7.43-7.29 (m, 3H), 7.17-7.10 (m, 2H), 5.44 (d, 1H), 5.30 (d, 1H), 3.52-3.47 (m, 2H), 3.08 (s, 3H), 1.24 (t, 3H) LCMS (M+H):394.0
164	N'-(6-chloro-1-(4-fluorobenzyl)-1-oxido-3-oxo-3H-1λ^4-benzo[d]isothiazol-5-yl)-N-	^{1}H-NMR (400 MHz, DMSO-D6) δ 8.32 (s, 1H), 8.16-8.02 (m, 1H), 7.40-7.26(m, 3H), 7.13 (t, 2H),

	ethyl-N-methylformimidamide	5.48 (d, 1H), 5.35 (d, 1H), 3.56-3.34 (m, 2H), 3.08 (s, 3H), 1.24 (t, 3H); LCMS (M+H):394.0
165	N-ethyl-N-methyl-N'-(1-oxido-3-oxo-1-(4-(trifluoromethoxy)benzyl)-3H-1λ^4-benzo[d]isothiazol-5-yl)formimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 8.09 (s, 1H), 8.01-7.93 (m, 1H), 7.46-7.34 (m, 2H), 7.44-7.19 (m, 4H), 5.47 (d, 1H), 5.35 (d, 1H), 3.51-3.33 (m, 2H), 3.06 (s, 3H), 1.17 (t, 3H); LCMS (M+H): 426.45
166	N-ethyl-N-methyl-N'-(1-oxido-3-oxo-1-(3-(trifluoromethyl)benzyl)-3H-1λ^4-benzo[d]isothiazol-5-yl)formimidamide	^{1}H-NMR (400 MHz, DMSO-D6) δ 8.07-7.96 (m, 2H), 7.67 (d, 1H), 7.57-7.50 (m, 3H), 7.32-7.28 (m, 1H), 7.17 (dd, 1H), 5.64-5.49 (m, 1H), 5.43 (d, 1H), 3.50-3.34 (m, 2H), 3.13-2.93 (s, 3H), 1.20-1.09 (t, 3H); LCMS (M+H): 410.45

* Compound names generated using Chemdraw Professional 16.0

As described herein the compounds of general formula (I) shows an extremely high fungicidal activity which is exerted with respect to numerous phytopathogenic fungi which attacks on important agricultural crops. Compounds of present invention were assessed for activity against one or more of the following:

Biological Test Examples (IN VITRO TEST)

Example 1

***Pyricularia oryzae* (Rice blast):** Compounds were dissolved in 0.3 % DMSO and then added to Potato Dextrose Agar medium just prior to dispensing it into Petri dishes. 5 mL medium with compound in the desired concentration was dispensed into 60 mm sterile Petri-plates. After solidification each plate was seeded with 5 mm size mycelial disc taken form periphery of actively growing virulent culture plate. Plates were incubated in growth chambers at 25 °C temperature and 60 % relative humidity for seven days and radial growth was measured. Compounds 1 2 7 12 13 18 19 23 24 25 26 27 28 29 30 31 32 33 34 35 36 39 40 41 42 46 47 48 49 51 53 54 55 56 57 58 59 60 62 69 71 72 73 74 75 76 80 81 82 83 86 97 99 100 102 106 107 108 109 110 111 112 117 120 121 125 127 128 132 136 137 138 145 146 148 149 151 152 153 154 155 156 157 158 159 160 161 162 164 165 at 300 ppm gave more than 70 % control in these tests when compared to the untreated check which showed extensive disease development.

Example 2

***Rhizoctonia solani* (Rice sheath blight/Potato black scurf):** Compounds were dissolved in 0.3 %

DMSO and then added to Potato Dextrose Agar medium just prior to dispensing it into Petri dishes. 5 mL medium with compound in the desired concentration was dispensed into 60 mm sterile Petri-plates. After solidification each plate was seeded with 5 mm size mycelial disc taken form periphery of actively growing virulent culture plate. Plates were incubated in growth chambers at 25 °C temperature and 60 % relative humidity for seven days and radial growth was measured. Compounds 5 6 11 14 16 17 21 22 50 63 66 68 90 92 93 95 96 113 114 124 134 135 140 141 142 143 144 145 147 150 166 at 300 ppm gave more than 70 % control in these tests when compared to the untreated check which showed extensive disease development.

Example 3

***Botrytis cinerea* (Gray mold):** Compounds were dissolved in 0.3 % DMSO and then added to Potato Dextrose Agar medium just prior to dispensing it into Petri dishes. 5 mL medium with compound in the desired concentration was dispensed into 60 mm sterile Petri-plates. After solidification each plate was seeded with 5 mm size mycelial disc taken form periphery of actively growing virulent culture plate. Plates were incubated in growth chambers at 22 °C temperature and 90 % relative humidity for seven days and radial growth was measured. Compounds 5 6 10 11 17 20 21 22 52 68 92 95 140 141 142 144 145 146 147 150 166 at 300 ppm gave more than 70 % control in these tests when compared to the untreated check which showed extensive disease development.

Example 4

Alternaria solani (early blight of tomato/potato): Compounds were dissolved in 0.3 % DMSO and then added to Potato Dextrose Agar medium just prior to dispensing it into Petri dishes. 5 mL medium with compound in the desired concentration was dispensed into 60 mm sterile Petri-plates. After solidification each plate was seeded with 5 mm size mycelial disc taken form periphery of actively growing virulent culture plate. Plates were incubated in growth chambers at 25 °C temperature and 60 % relative humidity for seven days and radial growth was measured. Compounds 4 5 6 8 9 10 11 14 15 16 17 21 22 25 38 44 45 50 51 52 53 61 62 63 64 66 67 68 70 78 90 91 92 93 94 95 96 101 102 105 113 114 115 119 122 123 124 125 126 127 128 130 131 133 134 135 139 140 141 142 143 144 147 150 156 157

163 165 166 at 300 ppm gave more than 70 % control in these tests when compared to the untreated check which showed extensive disease development.

Example 5

***Colletotrichum capsici* (anthracnose):** Compounds were dissolved in 0.3 % DMSO and then added to Potato Dextrose Agar medium just prior to dispensing it into Petri dishes. 5 mL medium with compound in the desired concentration was dispensed into 60 mm sterile Petri-plates. After solidification each plate was seeded with 5 mm size mycelial disc taken form periphery of actively growing virulent culture plate. Plates were incubated in growth chambers at 25 °C temperature and 60 % relative humidity for seven days and radial growth was measured. Compounds 10, 140, 147 and 150 at 300 ppm gave more than 70 % control in these tests when compared to the untreated check which showed extensive disease development.

Example 6

***Septoria lycopersici* (Leaf spot of tomato):** Compounds were dissolved in 0.3 % DMSO and then added to Potato Dextrose Agar medium just prior to dispensing it into Petri dishes. 5 mL medium with compound in the desired concentration was dispensed into 60 mm sterile Petri-plates. After solidification each plate was seeded with 5 mm size mycelial disc taken form periphery of actively growing virulent culture plate. Plates were incubated in growth chambers at 25 °C temperature and 70 % relative humidity for seven days and radial growth was measured. Compounds 3 4 5 6 8 9 10 11 14 16 17 20 44 45 61 63 68 90 91 92 93 95 96 113 114 122 123 124 134 139 140 142 147 at 300 ppm gave more than 70 % control in these tests when compared to the untreated check which showed extensive disease development.

Example 7

***Fusarium culmorum* (Foot rot of cereals):** Compounds were dissolved in 0.3 % DMSO and then added to Potato Dextrose Agar medium just prior to dispensing it into petri dishes. 5 mL medium with compound in the desired concentration was dispensed into 60 mm sterile Petri-plates. After solidification each plate was seeded with 5 mm size mycelial disc taken form periphery of actively growing virulent culture plate. Plates were incubated in growth chambers at 25 °C temperature and 60 % relative humidity for seven days and radial growth was measured. Compounds 4 10 25 140 144 147 and 150 at 300 ppm gave 70 % control in these tests when compared to the untreated check which showed

extensive disease development.

Biological Test Examples (GREENHOUSE)

Example A

***Phakopsora pachyrhizi* test in Soybean**

Compounds were dissolved in 2 % DMSO/Acetone and then mixed with water to the calibrated spray volume of 50 mL and poured into the spray bottles for further applications.

To test the preventive activity of compounds, healthy young soybean plants raised in the greenhouse were sprayed with active compound preparation at the stated application rates inside the spray cabinets using hallowcone nozzles. One day after treatment, the plants were inoculated with spore suspension containing 2.1 x 10^6 *Phakopsora pachyrhizi* inoculum. The inoculated plants were then kept in greenhouse chamber at 25 °C temperature and 90 % relative humidity for disease expression.

A visual assessment of compound's performance was carried out by rating the disease severity (0-100 % scale) on treated plants on 3, 7, 10 and 15 days after application. Efficacy (% control) of the compounds was calculated by comparing the disease rating in the treatment with the one of the untreated control. The sprayed plants were also assessed for compound's plant compatibility by recording symptoms like necrosis, chlorosis and stunting. Compounds 2 3 4 15 21 31 33 34 38 39 46 47 49 50 60 61 68 74 75 76 77 79 85 86 90 101 104 105 106 107 112 114 116 129 133 146 150 152 153 157 158 160 161 163 166 showed >70 % control at 500 ppm in these tests when compared to the untreated check which showed extensive disease development.

Example B

***Pyricularia oryzae* test in Rice**

Compounds were dissolved in 2% DMSO/Acetone and then mixed with water to calibrated spray volume of 50 mL. This 50 mL spray solution was poured into the spray bottles for further applications.

To test the preventive activity of compounds, healthy young rice seedlings/ plants raised in the greenhouse were sprayed with active compound preparation at the stated application rates inside the spray cabinets using hallowcone nozzles. One day after treatment, the plants were inoculated with spore suspension (sterile water) containing 1.4 x 10^6 *Pyricularia oryzae* inoculum. The inoculated plants were

then kept in greenhouse chamber at 24 °C temperature and 95 % relative humidity for disease expression.

A visual assessment of compound's performance was carried by rating the disease severity (0-100 % scale) on treated plants on 3, 7, 10 and 15 days after application. Efficacy (% control) of the compounds was calculated by comparing the disease rating in the treatment with untreated control. The spyayed plants were also assessed for compound's phytotoxic effects by recording symptoms like necrosis, chlorosis and stunting. Compounds 48 55 60 69 122 130 137 146 147 showed >70 % control at 500 ppm in these tests when compared to the untreated check which showed extensive disease development.

Example C

***Fusarium culmorum* test in Wheat**

Compounds were dissolved in 2% DMSO/Acetone and then mixed with water to calibrated spray volume of 50 mL. This 50 mL spray solution was poured into the spray bottles for further applications.

To test the preventive activity of compounds, healthy young wheat plants raised in the greenhouse were sprayed with active compound preparation at the stated application rates inside the spray cabinets using hallowcone nozzles. One day after treatment, the plants were inoculated with spore suspension (2 % Malt) containing 2 x 10^6 *Fusarium culmorum* inoculum. The inoculated plants were then kept in greenhouse chamber at 24 °C temperature and 80-90 % relative humidity for disease expression.

A visual assessment of compound's performance was carried by rating the disease severity (0-100 % scale) on treated plants on 3, 7, 10 and 15 days after application. Efficacy (% control) of the compounds was calculated by comparing the disease rating in the treatment with untreated control. The spyayed plants were also assessed for compound's phytotoxic effects by recording symptoms like necrosis, chlorosis and stunting. Compounds 10 23 32 38 106 114 124 146 showed >70 % control at 500 ppm in these tests when compared to the untreated check which showed extensive disease development.

Example D

***Botrytis cinera* test in tomato**

Compounds were dissolved in 2 % DMSO/Acetone and then mixed with water to calibrated spray volume of 50 mL. This 50 mL spray solution was poured into the spray bottles for further applications.

To test the preventive activity of compounds, healthy young tomato plants raised in the greenhouse were

sprayed with active compound preparation at the stated application rates inside the spray cabinets using hallowcone nozzles. One day after treatment, the plants were inoculated with spore suspension (2 % Malt) containing 1.2 x 10^6 *Botrytis cinera* inoculum. The inoculated plants were then kept in greenhouse chamber at 18-20 °C temperature and 90-100 % relative humidity for disease expression.

A visual assessment of compound's performance was carried by rating the disease severity (0-100 % scale) on treated plants on 3, 7, 10 and 15 days after application. Efficacy (% control) of the compounds was calculated by comparing the disease rating in the treatment with untreated control. The spyayed plants were also assessed for compound's phytotoxic effects by recording symptoms like necrosis, chlorosis and stunting. Compounds 1 10 12 15 21 50 68 74 76 77 85 86 87 93 96 98 107 127 128 132 142 144 145 showed >70 % control at 500 ppm in these tests when compared to the untreated check which showed extensive disease development.

Example E

***Alternaria solani* test in Tomato**

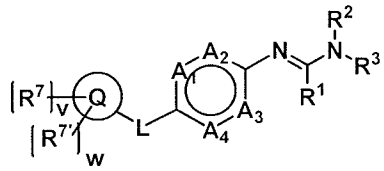
Compounds were dissolved in 2 % DMSO/Acetone and then mixed with water to calibrated spray volume of 50mL. This 50mL spray solution was poured into the spray bottles for further applications.

To test the preventive activity of compounds, healthy young Tomato plants raised in the greenhouse were sprayed with active compound preparation at the stated application rates inside the spray cabinets using hallowcone nozzles. One day after treatment, the plants were inoculated with spore suspension (2 % Malt) containing 0.24 x 10^6 *Alternaria solani* inoculum. The inoculated plants were then kept in greenhouse chamber at 22-24 °C temperature and 90-95 % relative humidity for disease expression.

A visual assessment of compound's performance was carried by rating the disease severity (0-100% scale) on treated plants on 3, 7, 10 and 15 days after application. Efficacy (% control) of the compounds was calculated by comparing the disease rating in the treatment with untreated control. The spyayed plants were also assessed for compound's phytotoxic effects by recording symptoms like necrosis, chlorosis and stunting. Compounds 6 10 21 68 93 126 131 141 166 showed >70 % control at 500 ppm in these tests when compared to the untreated check which showed extensive disease development.

WE CLAIM

Claim 1: A compound of general formula (I)



I

wherein,

R^1 is selected from the group consisting of hydrogen, CN, SR″, OR″, C_1-C_{12}-alkyl, C_2-C_{12}-alkenyl, C_2-C_{12}-alkynyl, C_1-C_{12}-haloalkyl, C_2-C_{12}-haloalkenyl, C_2-C_{12}-haloalkynyl, C_1-C_{12}-alkoxy, C_1-C_{12}-alkylthio, cyclic C_3-C_8-alkyl, cyclic C_4-C_8-alkenyl, cyclic C_4-C_8-alkynyl; wherein one or more carbon atoms in cyclic ring system may be replaced by heteroatoms selected from the group consisting of N, O, S and optionally including 1 to 3 ring members selected from the group consisting of C(=O), C(=S), $S(O)_m$ or $Si(R'_2)$;

R^2 and R^3 are independently selected from the group consisting of hydrogen, CN, $S(O)_nR''$, OR″, (C=O)-R″, C_1-C_{12}-alkyl, C_2-C_{12}-alkenyl, C_2-C_{12}-alkynyl, C_1-C_{12}-haloalkyl, C_2-C_{12}-haloalkenyl, C_2-C_{12}-haloalkynyl, cyclic C_3-C_8-alkyl, cyclic C_4-C_8-alkenyl, cyclic C_4-C_8-alkynyl, C_{5-18}-aryl, C_7-C_{19}-aralkyl; wherein one or more carbon atoms in cyclic ring system may be replaced by heteroatoms selected from the group consisting of N, O, S and optionally including 1 to 3 ring members selected from the group consisting of C(=O), C(=S), $S(O)_m$ or $Si(R'_2)$;

R^1 and R^2, R^2 and R^3 or R^1 and R^3 together with the atoms to which they are attached or together with further atoms selected from the group consisting of C, N, O, S and optionally including 1 to 3 ring members selected from the group consisting of C(=O), C(=S), $S(O)_m$ or $Si(R'_2)$ may form a three to seven membered non aromatic ring, which for its part may be substituted by one or more X, R′, OR′, SR′, $N(R')_2$, $Si(R')_3$, COOR′, CN, or $CON(R')_2$; wherein, each one of R^1, R^2 and R^3 may optionally be substituted by one or more groups selected from the group consisting of X, R′, OR′, SR′, $N(R')_2$, $Si(R')_3$, COOR′, CN, or $CON(R')_2$;

A_1, A_2, A_3 and A_4 represent CR^4 or nitrogen; provided that no more than two of A_1, A_2, A_3 and A_4 are to be nitrogen simulteneously.

R^4 is independently selected from the group consisting of hydrogen, X, CN, $N(R'')_2$, SCN, SF_5, $S(O)_nR''$, $Si(R')_3$, OR″, (C=O)-R″, CR′=NR″, C_1-C_{12}-alkyl, C_2-C_{12}-alkenyl, C_2-C_{12}-alkynyl, C_1-C_{12}-haloalkyl, C_2-C_{12}-

haloalkenyl, C_2-C_{12}-haloalkynyl, cyclic C_3-C_8-alkyl, cyclic C_4-C_8-alkenyl, cyclic C_4-C_8-alkynyl, C_{5-18}-aryl, C_7-C_{19}-aralkyl; wherein one or more carbon atoms in cyclic ring system may be replaced by heteroatoms selected from the group consisting of N, O, S and optionally including 1 to 3 ring members selected from the group consisting of C(=O), C(=S), $S(O)_m$ or $Si(R'_2)$; or

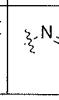
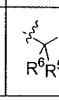
two vicinal R^4 together with the atom to which they are attached or together with further atoms selected from the group consisting of C, N, O, S and optionally including 1 to 3 ring members selected from the group consisting of C(=O), C(=S), $S(O)_m$ or $Si(R'_2)$ may form a four to seven membered ring, which for its part may be substituted by one or more X, R', OR', SR', $N(R')_2$, $Si(R')_3$, COOR', CN, or $CON(R')_2$;

L represents O, S, NR", CR^5R^6 or T;

wherein

when L represents O, S, NR", CR^5R^6 then $w \neq 0$

wherein T represents a radical selected from T1 to T12:

T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12
											

; wherein left side of the fragment T is attached to Q;

wherein  represent attachments of the atom or group;

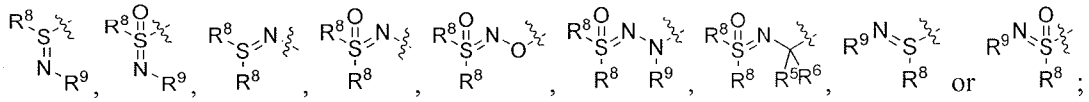
R^5 and R^6 are independently selected from the group consisting of hydrogen, X, CN, NR''_2, SCN, $S(O)_nR''$, $Si(R')_3$, OR', (C=O)-R", CR'=NR", C_1-C_{12}-alkyl, C_2-C_{12}-alkenyl, C_2-C_{12}-alkynyl, C_1-C_{12}-haloalkyl, C_2-C_{12}-haloalkenyl, C_2-C_{12}-haloalkynyl, cyclic C_3-C_8-alkyl, cyclic C_4-C_8-alkenyl, cyclic C_4-C_8-alkynyl, C_{5-18}-aryl, C_7-C_{19}-aralkyl; wherein one or more carbon atoms in cyclic ring system may be replaced by heteroatoms selected from the group consisting of N, O, S and optionally including 1 to 3 ring members selected from the group consisting of C(=O), C(=S), $S(O)_m$ or $Si(R'_2)$; or

R^5 and R^6 together with the atom to which they are attached or together with further atoms selected from the group consisting of C, N, O, S and optionally including 1 to 3 ring members selected from the group consisting of C(=O), C(=S), $S(O)_m$ or $Si(R'_2)$ may form a three to seven membered ring, which for its part may be substituted by one or more X, R', OR', SR', $N(R')_2$, $Si(R')_3$, COOR', CN, or $CON(R')_2$; or

R^5 and R^6 together represent group selected from =C(R'R'"), =S, =O, =NR'";

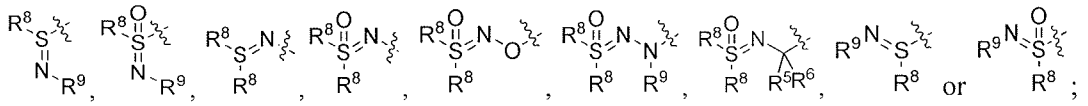
Q represents optionally substituted carbocycle, wherein one or more carbon atoms may be replaced by heteroatoms selected from N, O, S and optionally including 1 to 3 ring members selected from the group consisting of C(=O), C(=S), $S(O)_m$ or $Si(R'_2)$; wherein

R^7 is selected from the group consisting of hydrogen, X, CN, SCN, SF_5, OR″, NO_2, $N(R'')_2$, $Si(R')_3$, (C=O)-R″, $S(O)_nR''$, C_1-C_8-alkyl-$S(O)_nR''$, C_1-C_8-alkyl-(C=O)-R″, CR′=NR″, $S(O)_nC_{5-18}$-aryl, $S(O)_nC_7$-C_{19}-aralkyl, $S(O)_nC_7$-C_{19}-alkaryl, C_1-C_{12}-alkyl, C_2-C_{12}-alkenyl, C_2-C_{12}-alkynyl, C_1-C_{12}-haloalkyl, C_2-C_{12}-haloalkenyl, C_2-C_{12}-haloalkynyl, cyclic C_3-C_8-alkyl, cyclic C_4-C_8-alkenyl, cyclic C_4-C_8-alkynyl, C_7-C_{19}-aralkyl, bicyclic C_5-C_{12}-alkyl, bicyclic C_7-C_{12}-alkenyl,



wherein one or more carbon atoms in cyclic ring system may be replaced by heteroatoms selected from the group consisting of N, O, S and optionally including 1 to 3 ring members selected from the group consisting of C(=O), C(=S), $S(O)_m$ or $Si(R'_2)$;

$R^{7'}$ is independently selected from the group consisting of optionally substituted



wherein

R^8 is independently selected from the group consisting of R″, N(R′R″), $Si(R')_3$, (C=O)-R″, C_1-C_8-alkyl-$S(O)_nR''$, C_1-C_8-alkyl-(C=O)-R″, CR′=NR″, C_1-C_{12}-alkyl, C_2-C_{12}-alkenyl, C_2-C_{12}-alkynyl, C_1-C_{12}-haloalkyl, C_2-C_{12}-haloalkenyl, C_2-C_{12}-haloalkynyl, cyclic C_3-C_8-alkyl, cyclic C_4-C_8-alkenyl, cyclic C_4-C_8-alkynyl, C_7-C_{19}-aralkyl, bicyclic C_5-C_{12}-alkyl, bicyclic C_7-C_{12}-alkenyl, fused or non-fused or bicyclic C_3-C_{18}-carbocycle substituted with one or more R^{10}; wherein one or more carbon atoms in cyclic ring system may be replaced by heteroatoms selected from the group consisting of N, O, S and optionally including 1 to 3 ring members selected from the group consisting of C(=O), C(=S), $S(O)_m$ or $Si(R'_2)$;

R^9 is selected from the group consisting of hydrogen, CN, OR′, N(R′R″), $Si(R')_3$, (C=O)-R‴, $S(O)_nR'''$, C_1-C_8-alkyl-$S(O)_nR'''$, C_1-C_8-alkyl-(C=O)-R‴, CR′=NR″, $S(O)_nC_{5-18}$-aryl, $S(O)_nC_7$-C_{19}-aralkyl, $S(O)_nC_7$-C_{19}-alkaryl, C_1-C_{12}-alkyl, C_2-C_{12}-alkenyl, C_2-C_{12}-alkynyl, C_2-C_{12}-alkynyl-C_1-C_6-alkyl, C_1-C_{12}-haloalkyl, C_2-C_{12}-haloalkenyl, C_2-C_{12}-haloalkynyl, cyclic C_3-C_8-alkyl, cyclic C_4-C_8-

alkenyl, cyclic C_4-C_8-alkynyl, C_7-C_{19}-aralkyl, bicyclic C_5-C_{12}-alkyl, bicyclic C_7-C_{12}-alkenyl, fused or non fused or bicyclic C_3-C_{18}-carbocycle substituted with one or more R^{10}; wherein one or more carbon atoms in cyclic ring system may be replaced by heteroatoms selected from the group consisting of N, O, S and optionally including 1 to 3 ring members selected from the group consisting of C(=O), C(=S), $S(O)_m$ or $Si(R'_2)$; or

R^7 and R^8, R^7 and R^9, R^8 and R^9, R^8 and R^4, two R^8 or two R^7 together with the atom to which they are attached or together with further atoms selected from the group consisting of C, N, O, S and optionally including 1 to 3 ring members selected from the group consisting of C(=O), C(=S), $S(O)_m$ or $Si(R'_2)$ may form a three to seven membered ring, which for its part may be substituted by one or more X, R', OR', SR', $N(R')_2$, $Si(R')_3$, COOR', CN, or $CON(R')_2$;

R^{10} is selected from the group consisting of hydrogen, X, CN, $N(R'')_2$, SCN, $S(O)_nR''$, $Si(R')_3$, OR', (C=O)-R'', CR'=NR'', C_1-C_{12}-alkyl, C_2-C_{12}-alkenyl, C_2-C_{12}-alkynyl, C_1-C_{12}-haloalkyl, C_2-C_{12}-haloalkenyl, C_2-C_{12}-haloalkynyl, cyclic C_3-C_8-alkyl, cyclic C_4-C_8-alkenyl, wherein one or more carbon atoms in cyclic ring system may be replaced by heteroatoms selected from the group consisting of N, O, S and optionally including 1 to 3 ring members selected from the group consisting of C(=O), C(=S), $S(O)_m$ or $Si(R'_2)$;

wherein each one of R^4, R^5, R^6, R^7, R^8, R^9 and R^{10} may optionally be substituted by one or more groups selected from the group consisting of X, R', OR', SR', N(R'R''), $Si(R')_3$, COOR', CN, and CON(R'R'');

wherein

X represents halogen;

R' represents hydrogen, C_1-C_{12}-alkyl or cyclic C_3-C_{10}-alkyl wherein alkyl and cycloalkyl groups may be optionally substituted by one or more X;

R'' represents hydrogen; $N(R')_2$, OR', C_1-C_{12}-alkyl, C_1-C_{12}-haloalkyl, cyclic C_3-C_8-alkyl which may be optionally substituted by one or more groups selected from the group consisting of X, R', OR', SR', $N(R')_2$, $Si(R')_3$, COOR', CN, or $CON(R')_2$, C_{5-18}-aryl which may be optionally substituted by one or more X, R', OR', SR', $N(R')_2$, $Si(R')_3$, COOR', CN, or $CON(R')_2$; wherein one or more carbon atoms in cyclic ring system may be replaced by heteroatoms selected from the group consisting of N, O, S and optionally including 1 to 3 ring members selected from the group consisting of C(=O), C(=S), $S(O)_m$ or $Si(R'_2)$;

R''' is selected from the groups consisting of hydrogen, R'', CN, OR', (C=O)-R', COOR', $CON(R')_2$, C_1-C_{12}-alkyl, C_1-C_{12}-haloalkyl, C_2-C_{12}-alkenyl, C_2-C_{12}-alkynyl, cyclic C_3-C_8-alkyl,

cyclic C_4-C_8-alkenyl, cyclic C_4-C_8-alkynyl, C_6-C_{18}-aryl, C_7-C_{19}-aralkyl, C_7-C_{19}-alkaryl; wherein one or more carbon atoms in cyclic ring system may be replaced by heteroatoms selected from the group consisting of N, O, S and optionally including 1 to 3 ring members selected from the group consisting of C(=O), C(=S), $S(O)_m$ or $Si(R'_2)$; and each of the above groups may be substituted by one or more groups selected from the group consisting of X, R', OR', SR', $N(R')_2$, $Si(R')_3$, COOR', CN, or $CON(R')_2$;

wherein

n represents integer 0, 1 or 2; v represents an integer 0, 1, 2, 3, 4 or 5; and w represents an integer 0 or 1; and agronomically acceptable salts, isomers/structural isomers, stereo-isomers, diastereoisomers, enantiomers, tautomers, or N-oxides thereof.

Claim 2: A compound of general formula (I) according to claim 1 wherein:

R^1 is selected from hydrogen, C_1-C_6-alkyl, C_1-C_6-alkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkyl, or C_3-C_8-cycloalkyl;

R^2 and R^3 are independently selected from CN, C_1-C_6-alkyl, C_2-C_6-alkenyl, C_2-C_6- alkynyl, C_1-C_6-alkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkyl, C_3-C_8-cycloalkyl or non aromatic C_3-C_8-heterocyclyl; or

R^1 and R^2, R^2 and R^3 or R^1 and R^3 together with the atoms to which they are attached or together with further atoms selected from the group consisting of C, N, O, S and optionally including 1 to 3 ring members selected from the group consisting of C(=O), C(=S), $S(O)_m$ and $Si(R'_2)$ may form a three to seven membered non-aromatic ring, which for its part may be substituted by one or more X, R', OR', SR' and CN;

R^4 is seleccted from hydrogen, X, CN, $S(O)_nR''$, N(R'R''), (C=O)-R'', CR'=NR'', C_1-C_6-alkyl, C_2-C_6-alkenyl C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6-alkylthio C_1-C_6-haloalkylthio, C_3-C_8-cycloalkyl, C_3-C_8-cycloalkylthio, C_3-C_8-heterocyclyl; or

two vicinal R^4 together with the atom to which they are attached or together with further atoms selected from the group consisting of C, N, O, S and optionally including 1 to 3 ring members selected from the group consisting of C(=O), C(=S), $S(O)_m$ and $Si(R'_2)$ may form a three to seven membered ring, which for its part may be substituted by one or more X, R', OR', SR', NR'_2, SiR'_3, COOR', CN or $CON(R')_2$;

L represents O, S, NR'', CR^5R^6 or T2, T3, T4, T7, T8, T9, T12;

Q is cyclopropyl, cyclobutyl, phenyl, naphthyl, furyl, thienyl, pyrrolyl, isoxazolyl, thiazolyl, isothiazolyl, thiadiazolyl, pyrazolyl, oxazolyl, imidazolyl, oxadiazolyl, triazolyl, pyridinyl, pyridazinyl, pyrimidinyl,

pyrazinyl, triazinyl, indolyl, benzimidazolyl, indazolyl, benzofuranyl, benzothiophenyl, benzothiazolyl, benzoxazolyl, quinolinyl, isoquinolinyl, quinazolinyl, cinnonyl, indolizinyl, pyrazolo[1,5-a]pyridinyl, imidazo[1,2-a]pyridinyl, pyrrolo[1,2-a]pyrimidinyl, pyrazolo[1,5-a]pyrimidinyl, imidazo[1,2-a]pyrimidinyl, pyrrolo[1,2-a]pyrazinyl, pyrazolo[1,5-a]pyrazinyl, imidazo[1,2-a]pyrazinyl; wherein Q is optionally substituted with one or more R^7;

R^8 is independently selected from the group consisting of R″, (C=O)-R‴, C_1-C_8-alkyl-$S(O)_nR''$, C_1-C_8-alkyl-(C=O)-R″, CR′=NR″, C_1-C_{12}-alkyl, C_2-C_{12}-alkenyl, C_2-C_{12}-alkynyl, C_1-C_{12}-haloalkyl, C_2-C_{12}-haloalkenyl, C_2-C_{12}-haloalkynyl, cyclic C_3-C_8-alkyl, cyclic C_4-C_8-alkenyl, cyclic C_4-C_8-alkynyl, C_7-C_{19}-aralkyl, bicyclic C_5-C_{12}-alkyl, bicyclic C_7-C_{12}-alkenyl, fused or non-fused or bicyclic C_3-C_{18}-carbocycle substituted with one or more R^{10}; wherein one or more carbon atoms in cyclic ring system may be replaced by heteroatoms selected from the group consisting of N, O, S and optionally including 1 to 3 ring members selected from the group consisting of C(=O), C(=S), $S(O)_m$ or $Si(R'_2)$;

R^9 is selected from the group consisting of hydrogen, CN, OR′, N(R′R″), $Si(R')_3$, (C=O)-R‴, $S(O)_nR'''$, C_1-C_8-alkyl-$S(O)_nR'''$, C_1-C_8-alkyl-(C=O)-R‴, CR′=NR″, $S(O)_nC_{5-18}$-aryl, $S(O)_nC_7$-C_{19}-aralkyl, $S(O)_nC_7$-C_{19}-alkaryl, C_1-C_{12}-alkyl, C_2-C_{12}-alkenyl, C_2-C_{12}-alkynyl, C_2-C_{12}-alkynyl-C_1-C_6-alkyl, C_1-C_{12}-haloalkyl, C_2-C_{12}-haloalkenyl, C_2-C_{12}-haloalkynyl, cyclic C_3-C_8-alkyl, cyclic C_4-C_8-alkenyl, cyclic C_4-C_8-alkynyl, C_7-C_{19}-aralkyl, C_7-C_{19}-alkaryl, bicyclic C_5-C_{12}-alkyl, bicyclic C_7-C_{12}-alkenyl, fused or non fused or bicyclic C_3-C_{18}-carbocycle substituted with one or more R^{10}; wherein one or more carbon atoms in cyclic ring system may be replaced by heteroatoms selected from the group consisting of N, O, S and optionally including 1 to 3 ring members selected from the group consisting of C(=O), C(=S), $S(O)_m$ or $Si(R'_2)$;

wherein R^1, R^2, R^3 R^4, R^7, R^8 and R^9 are optionally substituted by one or more groups selected from the group consisting of X, R″, OR′, SR′, NR'_2, SiR'_3, COOR′, CN or $CO(NR')_2$.

Claim 3: A compound of general formula (I) according to claim 1 wherein:

R^1 is selected from hydrogen, C_1-C_6-alkyl or C_3-C_8-cycloalkyl;

R^2 and R^3 are independently selected from C_1-C_6-alkyl, C_1-C_6-haloalkyl or C_3-C_8-cycloalkyl;

R^4 is selected from hydrogen X, CN, S(O)nR′, OR″, N(R′R″), C_1-C_6-alkyl, C_1-C_6-haloalkyl or C_3-C_8-cycloalkyl;

R^5 and R^6 are hydrogen, X, C_1-C_6-alkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6-haloalkoxy, C_1-C_6-alkylthio, C_1-C_6-haloalkylthio, C_3-C_8-cycloalkyl; or

R^5 and R^6 together with the atom to which they are attached or together with further atoms selected from the group consisting of C, N, O, S may form a three to four membered ring, which for its part may be substituted by one or more X, R′, OR′, SR′, NR'_2, SiR'_3, COOR′, CN or $CON(R')_2$;

Q is cyclopropyl, phenyl, napthalenyl, thieny, thiazolyl, thiadiazolyl, isothiazolyl, pyrazolyl, pyridinyl, pyridazinyl, pyrimidinyl, pyrazinyl or quinolinyl; wherein Q is optionally substituted with one or more R^7;

wherein R^1, R^2, R^3 R^4, R^5, R^6 and R^7 may further optionally substituted by one or more groups selected from the group consisting of X, R″, OR′, SR′, NR'_2, SiR'_3, COOR′, CN or $CON(R')_2$;

Claim 4: A compound according to claim 1 wherein the compound of general formula (I) is selected from

N-((3-((3-bromo-5-(((ethyl(methyl)amino)methylene)amino)-6-methylpyridin-2-yl)oxy)phenyl)(methyl)(oxo)-λ^6-sulfaneylidene)cyclobutanecarboxamide; N'-(2-chloro-4-((Z)-N-cyano-S-phenylsulfinimidoyl)-5-methylphenyl)-N-ethyl-N-methylformimidamide; N'-(2-chloro-4-(N-cyanophenylsulfonimidoyl)-5-methylphenyl)-N-ethyl-N-methylformimidamide; N'-(2,5-dimethyl-4-((methyl(oxo)(phenyl)-λ^6-sulfaneylidene)amino)phenyl)-N-ethyl-N-methylformimidamide; N-((Z)-(5-chloro-4-(((ethyl(methyl)amino)methylene)amino)-2-methylphenyl)(phenyl)-l4-sulfaneylidene)-2,2,2-trifluoroacetamide; N'-(2-chloro-5-methyl-4-((methyl(oxo)(phenyl)-λ^6-sulfaneylidene)amino)phenyl)-N-ethyl-N-methylformimidamide; N'-(2-chloro-4-(3-(N,S-dimethylsulfonimidoyl)phenoxy)-5-methylphenyl)-N-ethyl-N-methylformimidamide; N'-(2-chloro-4-(3-(N-cyanopropan-2-ylsulfonimidoyl)phenoxy)-5-methylphenyl)-N-ethyl-N-methylformimidamide; N'-(2-chloro-5-methyl-4-(3-(S-methyl-N-phenylsulfonimidoyl)phenoxy)phenyl)-N-ethyl-N-methylformimidamide; N-((3-(5-chloro-4-(((ethyl(methyl)amino)methylene)amino)-2-methylphenoxy)phenyl)(isopropyl)(oxo)-λ^6-sulfaneylidene)-2,2,2-trifluoroacetamide; N-((3-(5-chloro-4-(((ethyl(methyl)amino)methylene)amino)-2-methylphenoxy)phenyl)(methyl)(oxo)-λ^6-sulfaneylidene)-2,2,2-trifluoroacetamide; N'-(2-chloro-4-(3-(N-cyano-S-methylsulfonimidoyl)phenoxy)-5-methylphenyl)-N-ethyl-N-methylformimidamide; N'-(2-chloro-4-(3-(N-ethyl-S-(trifluoromethyl)sulfonimidoyl)phenoxy)-5-methylphenyl)-N-ethyl-N-methylformimidamide; N'-(2-chloro-4-(3-(N-ethyl-S-methylsulfonimidoyl)phenoxy)-5-methylphenyl)-N-ethyl-N-methylformimidamide; N'-(4-((Z)-S-benzyl-N-cyanosulfinimidoyl)-2-chloro-5-methylphenyl)-N-ethyl-N-methylformimidamide; N-((5-chloro-4-(((ethyl(methyl)amino)methylene)amino)-2-methylphenyl)(methyl)(oxo)-λ^6-sulfaneylidene)-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide; N'-(2-chloro-5-methyl-4-(S-methyl-N-phenylsulfonimidoyl)phenyl)-N-ethyl-N-methylformimidamide; N'-(2-chloro-4-(3-(N-(cyclopropylmethyl)-S-methylsulfonimidoyl)phenoxy)-5-methylphenyl)-N-ethyl-N-methylformimidamide; N'-(2-chloro-5-methyl-4-(3-(S-methyl-N-(pyridin-2-yl)sulfonimidoyl)phenoxy)phenyl)-N-ethyl-N-methylformimidamide; N'-(2-chloro-4-(3-(S-

(cyclopropylmethyl)-N-ethylsulfonimidoyl)phenoxy)-5-methylphenyl)-N-ethyl-N-methylformimidamide; N'-(4-(3-(N-benzyl-S-methylsulfonimidoyl)phenoxy)-2-chloro-5-methylphenyl)-N-ethyl-N-methylformimidamide; N'-(2-chloro-4-(N-(3,5-difluorophenyl)-S-methylsulfonimidoyl)-5-methylphenyl)-N-ethyl-N-methylformimidamide; N'-(2-chloro-5-methyl-4-(S-methyl-N-(3,4,5-trifluorophenyl)sulfonimidoyl)phenyl)-N-ethyl-N-methylformimidamide; N'-(2-chloro-4-(N-(3-methoxyphenyl)-S-methylsulfonimidoyl)-5-methylphenyl)-N-ethyl-N-methylformimidamide; N'-(2-chloro-4-(3-(N-ethyl-3-methylbutylsulfonimidoyl)phenoxy)-5-methylphenyl)-N-ethyl-N-methylformimidamide; N'-(2-chloro-4-(3-(N-(cyclopropylmethyl)-3-methylbutylsulfonimidoyl)phenoxy)-5-methylphenyl)-N-ethyl-N-methylformimidamide; N'-(4-(N-(3,5-bis(trifluoromethyl)phenyl)-S-methylsulfonimidoyl)-2-chloro-5-methylphenyl)-N-ethyl-N-methylformimidamide; N-((5-chloro-4-(((ethyl(methyl)amino)methylene)amino)-2-methylphenyl)(methyl)(oxo)-λ^6-sulfaneylidene)benzamide; 3-chloro-N-((5-chloro-4-(((ethyl(methyl)amino)methylene)amino)-2-methylphenyl)(methyl)(oxo)-λ^6-sulfaneylidene)-4-fluorobenzamide; N-((5-chloro-4-(((ethyl(methyl)amino)methylene)amino)-2-methylphenyl)(methyl)(oxo)-λ^6-sulfaneylidene)-3-(trifluoromethyl)benzamide; N-((5-chloro-4-(((ethyl(methyl)amino)methylene)amino)-2-methylphenyl)(methyl)(oxo)-λ^6-sulfaneylidene)-3,5-bis(trifluoromethyl)benzamide; N-((3-((3-bromo-5-(((ethyl(methyl)amino)methylene)amino)-6-methylpyridin-2-yl)oxy)phenyl)(methyl)(oxo)-λ^6-sulfaneylidene)acetamide; 3,5-dichloro-N-((5-chloro-4-(((ethyl(methyl)amino)methylene)amino)-2-methylphenyl)(methyl)(oxo)-λ^6-sulfaneylidene)benzamide; N-((5-chloro-4-(((ethyl(methyl)amino)methylene)amino)-2-methylphenyl)(methyl)(oxo)-λ^6-sulfaneylidene)-3,4-difluorobenzamide; N-((5-chloro-4-(((ethyl(methyl)amino)methylene)amino)-2-methylphenyl)(methyl)(oxo)-λ^6-sulfaneylidene)-3-methoxybenzamide; N'-(2-chloro-5-methyl-4-(S-methyl-N-(3-(trifluoromethyl)phenyl)sulfonimidoyl)phenyl)-N-ethyl-N-methylformimidamide; N-((5-chloro-4-(((ethyl(methyl)amino)methylene)amino)-2-methylphenyl)(methyl)(oxo)-λ^6-sulfaneylidene)-3-(trifluoromethoxy)benzamide; N'-(5-bromo-2-methyl-6-(3-(S-methylsulfonimidoyl)phenoxy)pyridin-3-yl)-N-ethyl-N-methylformimidamide; N-((5-chloro-4-(((ethyl(methyl)amino)methylene)amino)-2-methylphenyl)(methyl)(oxo)-λ^6-sulfaneylidene)-3-fluorobenzamide; 3-chloro-N-((5-chloro-4-(((ethyl(methyl)amino)methylene)amino)-2-methylphenyl)(methyl)(oxo)-λ^6-sulfaneylidene)benzamide; N'-(2-chloro-4-(N-(4-chloro-3-(trifluoromethyl)phenyl)-S-methylsulfonimidoyl)-5-methylphenyl)-N-ethyl-N-methylformimidamide; N'-(5-bromo-6-(3-(N-ethyl-S-methylsulfonimidoyl)phenoxy)-2-methylpyridin-3-yl)-N-ethyl-N-methylformimidamide; N-((5-chloro-4-(((ethyl(methyl)amino)methylene)amino)-2-methylphenyl)(methyl)(oxo)-λ^6-sulfaneylidene)-3-methylbenzamide; N'-(2-chloro-5-methyl-4-(S-methyl-N-(4-(pentafluoro-λ^6-sulfaneyl)phenyl)sulfonimidoyl)phenyl)-N-ethyl-N-methylformimidamide; N'-(2-chloro-5-methyl-4-(S-methyl-N-(3-(pentafluoro-λ^6-sulfaneyl)phenyl)sulfonimidoyl)phenyl)-N-ethyl-N-methylformimidamide;

N-((3-((3-bromo-5-(((ethyl(methyl)amino)methylene)amino)-6-methylpyridin-2-yl)oxy)phenyl)(methyl)(oxo)-λ^6-sulfaneylidene)-2,2,2-trifluoroacetamide; N'-(5-bromo-2-methyl-6-((methyl(oxo)(phenyl)-λ^6-sulfaneylidene)amino)pyridin-3-yl)-N-ethyl-N-methylformimidamide; N'-(2-chloro-5-methyl-4-(3-(S-methyl-N-(prop-2-yn-1-yl)sulfonimidoyl)phenoxy)phenyl)-N-ethyl-N-methylformimidamide; N'-(5-bromo-2-methyl-6-(3-(S-methyl-N-(2,2,2-trifluoroethyl)sulfonimidoyl)phenoxy)pyridin-3-yl)-N-ethyl-N-methylformimidamide; N-((5-chloro-4-(((ethyl(methyl)amino)methylene)amino)-2-methylphenyl)(ethyl)(oxo)-λ^6-sulfaneylidene)-3-methoxybenzamide; N-((5-chloro-4-(((ethyl(methyl)amino)methylene)amino)-2-methylphenyl)(ethyl)(oxo)-λ^6-sulfaneylidene)-3-(trifluoromethyl)benzamide; N-((5-chloro-4-(((ethyl(methyl)amino)methylene)amino)-2-methylphenyl)(ethyl)(oxo)-λ^6-sulfaneylidene)-3-fluorobenzamide; N-((5-chloro-4-(((ethyl(methyl)amino)methylene)amino)-2-methylphenyl)(ethyl)(oxo)-λ^6-sulfaneylidene)-3-(trifluoromethoxy)benzamide; N-ethyl-N'-(4-(3-(N-ethyl-S-methylsulfonimidoyl)phenoxy)-2,5-dimethylphenyl)-N-methylformimidamide; N-ethyl-N'-(4-((isopentyl(oxo)(phenyl)-λ^6-sulfaneylidene)amino)-2,5-dimethylphenyl)-N-methylformimidamide; N'-(5-bromo-6-(((4-bromophenyl)(methyl)(oxo)-λ^6-sulfaneylidene)amino)-2-methylpyridin-3-yl)-N-ethyl-N-methylformimidamide; N'-(5-bromo-6-((isopentyl(oxo)(phenyl)-λ^6-sulfaneylidene)amino)-2-methylpyridin-3-yl)-N-ethyl-N-methylformimidamide; N-((5-chloro-4-(((ethyl(methyl)amino)methylene)amino)-2-methylphenyl)(ethyl)(oxo)-λ^6-sulfaneylidene)benzamide; N-((5-chloro-4-(((ethyl(methyl)amino)methylene)amino)-2-methylphenyl)(ethyl)(oxo)-λ^6-sulfaneylidene)-4-(difluoromethyl)-1-methyl-1H-pyrazole-3-carboxamide; N'-(2-chloro-5-methyl-4-(N-(3-(trifluoromethyl)phenyl)ethylsulfonimidoyl)phenyl)-N-ethyl-N-methylformimidamide; N'-(2-chloro-5-methyl-4-(N-(3-(trifluoromethoxy)phenyl)ethylsulfonimidoyl)phenyl)-N-ethyl-N-methylformimidamide; N'-(2-chloro-5-methyl-4-(N-(3,4,5-trifluorophenyl)ethylsulfonimidoyl)phenyl)-N-ethyl-N-methylformimidamide; N'-(2-chloro-5-methyl-4-(N-(m-tolyl)ethylsulfonimidoyl)phenyl)-N-ethyl-N-methylformimidamide; N'-(2-chloro-5-methyl-4-(N-phenylethylsulfonimidoyl)phenyl)-N-ethyl-N-methylformimidamide; N'-(4-(3-(N-(cyclopropylmethyl)-S-methylsulfonimidoyl)phenoxy)-2,5-dimethylphenyl)-N-ethyl-N-methylformimidamide; N-ethyl-N'-(4-((isopropyl(oxo)(phenyl)-λ^6-sulfaneylidene)amino)-2,5-dimethylphenyl)-N-methylformimidamide; N-((3-(4-(((ethyl(methyl)amino)methylene)amino)-2,5-dimethylphenoxy)phenyl)(methyl)(oxo)-λ^6-sulfaneylidene)cyclobutanecarboxamide; N-((3-((3-bromo-5-(((ethyl(methyl)amino)methylene)amino)-6-methylpyridin-2-yl)oxy)phenyl)(methyl)(oxo)-λ^6-sulfaneylidene)pivalamide; N/A; N'-(5-bromo-2-methyl-6-(3-(S-methyl-N-neopentylsulfonimidoyl)phenoxy)pyridin-3-yl)-N-ethyl-N-methylformimidamide; N'-(4-(3-(N-(cyclobutylmethyl)-S-methylsulfonimidoyl)phenoxy)-2,5-dimethylphenyl)-N-ethyl-N-methylformimidamide; 3-chloro-N-((5-chloro-4-

(((ethyl(methyl)amino)methylene)amino)-2-methylphenyl)(isobutyl)(oxo)-λ^6-sulfaneylidene)-4-fluorobenzamide; N-((3-((3-bromo-5-(((ethyl(methyl)amino)methylene)amino)-6-methylpyridin-2-yl)oxy)phenyl)(methyl)(oxo)-λ^6-sulfaneylidene)cyclopropanecarboxamide; N-ethyl-N'-(4-(((3-methoxyphenyl)(methyl)(oxo)-λ^6-sulfaneylidene)amino)-2,5-dimethylphenyl)-N-methylformimidamide; N-ethyl-N'-(4-((isopropyl(3-methoxyphenyl)(oxo)-λ^6-sulfaneylidene)amino)-2,5-dimethylphenyl)-N-methylformimidamide; N-ethyl-N'-(4-((isopentyl(3-methoxyphenyl)(oxo)-λ^6-sulfaneylidene)amino)-2,5-dimethylphenyl)-N-methylformimidamide; N'-(5-bromo-6-((isopentyl(3-methoxyphenyl)(oxo)-λ^6-sulfaneylidene)amino)-2-methylpyridin-3-yl)-N-ethyl-N-methylformimidamide; N'-(5-bromo-6-((isopropyl(3-methoxyphenyl)(oxo)-λ^6-sulfaneylidene)amino)-2-methylpyridin-3-yl)-N-ethyl-N-methylformimidamide; N'-(5-bromo-6-(((4-chlorophenyl)(isopropyl)(oxo)-λ^6-sulfaneylidene)amino)-2-methylpyridin-3-yl)-N-ethyl-N-methylformimidamide; N'-(5-bromo-6-(((4-chlorophenyl)(oxo)(propyl)-λ^6-sulfaneylidene)amino)-2-methylpyridin-3-yl)-N-ethyl-N-methylformimidamide; N'-(5-bromo-6-(((4-chlorophenyl)(methyl)(oxo)-λ^6-sulfaneylidene)amino)-2-methylpyridin-3-yl)-N-ethyl-N-methylformimidamide; N'-(5-bromo-6-(((4-chlorophenyl)(isopentyl)(oxo)-λ^6-sulfaneylidene)amino)-2-methylpyridin-3-yl)-N-ethyl-N-methylformimidamide; N'-(2-chloro-4-(N-(3-chloro-4-fluorophenyl)-2-methylpropylsulfonimidoyl)-5-methylphenyl)-N-ethyl-N-methylformimidamide; N/A; '-(4-(N-(3,5-bis(trifluoromethyl)phenyl)-2-methylpropylsulfonimidoyl)-2-chloro-5-methylphenyl)-N-ethyl-N-methylformimidamide; N'-(2-chloro-5-methyl-4-(2-methyl-N-phenylpropylsulfonimidoyl)phenyl)-N-ethyl-N-methylformimidamide; N'-(5-bromo-6-(((3-methoxyphenyl)(methyl)(oxo)-λ^6-sulfaneylidene)amino)-2-methylpyridin-3-yl)-N-ethyl-N-methylformimidamide; N'-(2-chloro-4-(N-(3-chloro-4-fluorobenzyl)-S-methylsulfonimidoyl)-5-methylphenyl)-N-ethyl-N-methylformimidamide; N'-(2-chloro-4-(N-(3-methoxybenzyl)-S-methylsulfonimidoyl)-5-methylphenyl)-N-ethyl-N-methylformimidamide; N'-(2-chloro-4-(N-(3-chlorobenzyl)-S-methylsulfonimidoyl)-5-methylphenyl)-N-ethyl-N-methylformimidamide; N'-(2-chloro-5-methyl-4-(S-methyl-N-(3-(trifluoromethyl)benzyl)sulfonimidoyl)phenyl)-N-ethyl-N-methylformimidamide; N'-(2-chloro-5-methyl-4-(S-methyl-N-(3-(trifluoromethoxy)benzyl)sulfonimidoyl)phenyl)-N-ethyl-N-methylformimidamide; N-ethyl-N'-(4-(3-(N-ethyl-3-methylbutylsulfonimidoyl)phenoxy)-2,5-dimethylphenyl)-N-methylformimidamide; N'-(2,5-dimethyl-4-(3-(S-methyl-N-(trifluoromethyl)sulfonimidoyl)phenoxy)phenyl)-N-ethyl-N-methylformimidamide; N'-(4-(3-(N-(cyclopropylmethyl)-3-methylbutylsulfonimidoyl)phenoxy)-2,5-dimethylphenyl)-N-ethyl-N-methylformimidamide; N'-(2,5-dimethyl-4-(3-(S-methyl-N-(2,2,2-trifluoroethyl)sulfonimidoyl)phenoxy)phenyl)-N-ethyl-N-methylformimidamide; N'-(2,5-dimethyl-4-(3-(S-methyl-N-(pyridin-2-yl)sulfonimidoyl)phenoxy)phenyl)-N-ethyl-N-methylformimidamide; N'-(2,5-dimethyl-4-(3-(S-methyl-N-phenylsulfonimidoyl)phenoxy)phenyl)-N-ethyl-N-methylformimidamide; N'-

(4-(3-(N,S-dimethylsulfonimidoyl)phenoxy)-2,5-dimethylphenyl)-N-ethyl-N-methylformimidamide; N'-(2-chloro-4-(N-(3-chloro-4-fluorobenzyl)-2-methylpropylsulfonimidoyl)-5-methylphenyl)-N-ethyl-N-methylformimidamide; N'-(2-chloro-4-(N-(3-chlorobenzyl)-2-methylpropylsulfonimidoyl)-5-methylphenyl)-N-ethyl-N-methylformimidamide; N'-(2-chloro-5-methyl-4-(2-methyl-N-(3-(trifluoromethyl)benzyl)propylsulfonimidoyl)phenyl)-N-ethyl-N-methylformimidamide; N'-(4-(N-benzyl-S-methylsulfonimidoyl)-2-chloro-5-methylphenyl)-N-ethyl-N-methylformimidamide; N'-(5-bromo-6-(3-(N-isopentyl-S-methylsulfonimidoyl)phenoxy)-2-methylpyridin-3-yl)-N-ethyl-N-methylformimidamide; N'-(5-bromo-2-methyl-6-(3-(S-methyl-N-(2-(tetrahydro-2H-pyran-4-yl)ethyl)sulfonimidoyl)phenoxy)pyridin-3-yl)-N-ethyl-N-methylformimidamide; N'-(5-bromo-6-(((cyclopropylmethyl)(3-fluorophenyl)(oxo)-λ^6-sulfaneylidene)amino)-2-methylpyridin-3-yl)-N-ethyl-N-methylformimidamide; N'-(5-bromo-6-(((cyclopropylmethyl)(4-fluorophenyl)(oxo)-λ^6-sulfaneylidene)amino)-2-methylpyridin-3-yl)-N-ethyl-N-methylformimidamide; N-((3-((3-bromo-5-(((ethyl(methyl)amino)methylene)amino)-6-methylpyridin-2-yl)oxy)phenyl)(methyl)(oxo)-λ^6-sulfaneylidene)-3-methylbutanamide; N-((3-((3-bromo-5-(((ethyl(methyl)amino)methylene)amino)-6-methylpyridin-2-yl)oxy)phenyl)(methyl)(oxo)-λ^6-sulfaneylidene)-2-(tetrahydro-2H-pyran-4-yl)acetamide; N'-(2-chloro-4-(N-(4-(dimethylamino)phenyl)-2-methylpropylsulfonimidoyl)-5-methylphenyl)-N-ethyl-N-methylformimidamide; N'-(2-chloro-4-(N-(4-methoxyphenyl)-2-methylpropylsulfonimidoyl)-5-methylphenyl)-N-ethyl-N-methylformimidamide; N'-(2-chloro-4-(N-(3-(dimethylamino)phenyl)-2-methylpropylsulfonimidoyl)-5-methylphenyl)-N-ethyl-N-methylformimidamide; N'-(2-chloro-5-methyl-4-(2-methyl-N-(4-morpholinophenyl)propylsulfonimidoyl)phenyl)-N-ethyl-N-methylformimidamide; N'-(2-chloro-5-methyl-4-(2-methyl-N-(thiophen-3-yl)propylsulfonimidoyl)phenyl)-N-ethyl-N-methylformimidamide; N'-(2-chloro-5-methyl-4-(2-methyl-N-(3,4,5-trimethoxyphenyl)propylsulfonimidoyl)phenyl)-N-ethyl-N-methylformimidamide; N'-(4-(3-(N-cyanoethylsulfonimidoyl)phenoxy)-2,5-dimethylphenyl)-N-ethyl-N-methylformimidamide; N'-(4-(3-(N-cyano-S-methylsulfonimidoyl)phenoxy)-2,5-dimethylphenyl)-N-ethyl-N-methylformimidamide; N'-(2-chloro-5-methyl-4-(S-methylsulfonimidoyl)phenyl)-N-ethyl-N-methylformimidamide; N-((3-((3-bromo-5-(((ethyl(methyl)amino)methylene)amino)-6-methylpyridin-2-yl)oxy)phenyl)(ethyl)(oxo)-λ^6-sulfaneylidene)cyclopropanecarboxamide; N-((3-((3-bromo-5-(((ethyl(methyl)amino)methylene)amino)-6-methylpyridin-2-yl)oxy)phenyl)(ethyl)(oxo)-λ^6-sulfaneylidene)pivalamide; N'-(5-bromo-2-methyl-6-(3-(N-neopentylethylsulfonimidoyl)phenoxy)pyridin-3-yl)-N-ethyl-N-methylformimidamide; N'-(5-bromo-6-(3-(N-(cyclobutylmethyl)ethylsulfonimidoyl)phenoxy)-2-methylpyridin-3-yl)-N-ethyl-N-methylformimidamide; N-((3-((3-bromo-5-(((ethyl(methyl)amino)methylene)amino)-6-methylpyridin-2-yl)oxy)phenyl)(ethyl)(oxo)-λ^6-sulfaneylidene)cyclobutanecarboxamide; N'-(2-chloro-4-(N-(3,4-dimethoxyphenyl)-2-methylpropylsulfonimidoyl)-5-methylphenyl)-N-ethyl-N-methylformimidamide; N'-

(4-(3-(N-(cyanomethyl)-S-methylsulfonimidoyl)phenoxy)-2,5-dimethylphenyl)-N-ethyl-N-methylformimidamide; N'-(2-chloro-4-(4-(N,S-dimethylsulfonimidoyl)phenoxy)-5-methylphenyl)-N-ethyl-N-methylformimidamide; N'-(2-chloro-4-(4-(N-(cyclopropylmethyl)-S-methylsulfonimidoyl)phenoxy)-5-methylphenyl)-N-ethyl-N-methylformimidamide; N'-(2,5-dimethyl-4-(4-(S-methylsulfonimidoyl)benzyl)phenyl)-N-ethyl-N-methylformimidamide; N'-(2-chloro-4-(4-(N-cyano-S-methylsulfonimidoyl)phenoxy)-5-methylphenyl)-N-ethyl-N-methylformimidamide; N-ethyl-N'-(4-(4-(N-ethyl-S-methylsulfonimidoyl)benzyl)-2,5-dimethylphenyl)-N-methylformimidamide; N'-(4-(4-(N-(cyclopropylmethyl)-S-methylsulfonimidoyl)benzyl)-2,5-dimethylphenyl)-N-ethyl-N-methylformimidamide; N-ethyl-N'-(4-((1-isopropyl-1-oxido-3-oxo-3H-1λ^4-benzo[d]isothiazol-5-yl)amino)-2,5-dimethylphenyl)-N-methylformimidamide; N'-(4-(4-(N,S-dimethylsulfonimidoyl)benzyl)-2,5-dimethylphenyl)-N-ethyl-N-methylformimidamide; N'-(2-chloro-5-methyl-4-(4-(S-methyl-N-(trifluoromethyl)sulfonimidoyl)phenoxy)phenyl)-N-ethyl-N-methylformimidamide; N'-(4-((4-(N-(cyclopropylmethyl)-S-methylsulfonimidoyl)phenyl)(methyl)amino)-2,5-dimethylphenyl)-N-ethyl-N-methylformimidamide; N'-(2,5-dimethyl-4-(2-(S-methylsulfonimidoyl)benzyl)phenyl)-N-ethyl-N-methylformimidamide; N'-(4-(2-(N,S-dimethylsulfonimidoyl)benzyl)-2,5-dimethylphenyl)-N-ethyl-N-methylformimidamide; N'-(4-(2-(N-(cyclopropylmethyl)-S-methylsulfonimidoyl)benzyl)-2,5-dimethylphenyl)-N-ethyl-N-methylformimidamide; N'-(4-((4-(N-(cyclopropylmethyl)-S-methylsulfonimidoyl)phenyl)amino)-2,5-dimethylphenyl)-N-ethyl-N-methylformimidamide; N-ethyl-N'-(4-((3-(N-ethyl-S-methylsulfonimidoyl)phenyl)amino)-2,5-dimethylphenyl)-N-methylformimidamide; N-ethyl-N'-(4-((4-(N-ethyl-S-methylsulfonimidoyl)phenyl)(methyl)amino)-2,5-dimethylphenyl)-N-methylformimidamide; N'-(4-((3-(N,S-dimethylsulfonimidoyl)phenyl)(methyl)amino)-2,5-dimethylphenyl)-N-ethyl-N-methylformimidamide; N'-(2-chloro-5-methyl-4-(3-(S-(trifluoromethyl)sulfonimidoyl)phenoxy)phenyl)-N-ethyl-N-methylformimidamide; N'-(2-chloro-4-(3-(N-(cyclopropylmethyl)-S-(trifluoromethyl)sulfonimidoyl)phenoxy)-5-methylphenyl)-N-ethyl-N-methylformimidamide; N-((Z)-(3-(5-chloro-4-(((ethyl(methyl)amino)methylene)amino)-2-methylphenoxy)phenyl)(trifluoromethyl)-l4-sulfaneylidene)acetamide; N'-(2-chloro-5-methyl-4-(3-(N-methyl-S-(trifluoromethyl)sulfonimidoyl)phenoxy)phenyl)-N-ethyl-N-methylformimidamide; N'-(2-chloro-5-methyl-4-(2-(S-(trifluoromethyl)sulfonimidoyl)phenoxy)phenyl)-N-ethyl-N-methylformimidamide; N'-(2,5-dimethyl-4-(3-(S-(trifluoromethyl)sulfonimidoyl)phenoxy)phenyl)-N-ethyl-N-methylformimidamide; N'-(2-chloro-5-methyl-4-(2-(N-methyl-S-(trifluoromethyl)sulfonimidoyl)phenoxy)phenyl)-N-ethyl-N-methylformimidamide; N'-(2-chloro-4-(2-(N-ethyl-S-(trifluoromethyl)sulfonimidoyl)phenoxy)-5-methylphenyl)-N-ethyl-N-methylformimidamide; N'-(2,5-dimethyl-4-(3-(N-methyl-S-(trifluoromethyl)sulfonimidoyl)phenoxy)phenyl)-N-ethyl-N-methylformimidamide; N'-(2-chloro-4-(2-(N-(cyclopropylmethyl)-S-

(trifluoromethyl)sulfonimidoyl)phenoxy)-5-methylphenyl)-N-ethyl-N-methylformimidamide; N'-(1-benzyl-1-oxido-3-oxo-3H-1λ⁴-benzo[d]isothiazol-5-yl)-N-ethyl-N-methylformimidamide; N'-(1-(4-chlorobenzyl)-1-oxido-3-oxo-3H-1λ⁴-benzo[d]isothiazol-5-yl)-N-ethyl-N-methylformimidamide; N-ethyl-N-methyl-N'-(1-(4-methylbenzyl)-1-oxido-3-oxo-3H-1λ⁴-benzo[d]isothiazol-5-yl)formimidamide; N'-(1-benzyl-6-chloro-1-oxido-3-oxo-3H-1λ⁴-benzo[d]isothiazol-5-yl)-N-ethyl-N-methylformimidamide; N'-(1-benzyl-4-chloro-1-oxido-3-oxo-3H-1λ⁴-benzo[d]isothiazol-5-yl)-N-ethyl-N-methylformimidamide; N'-(1-benzyl-1-oxido-3H-1λ⁴-benzo[d]isothiazol-5-yl)-N-ethyl-N-methylformimidamide; N-ethyl-N'-(1-(4-fluorobenzyl)-1-oxido-3-oxo-3H-1λ⁴-benzo[d]isothiazol-5-yl)-N-methylformimidamide; N'-(1-(4-bromobenzyl)-1-oxido-3-oxo-3H-1λ⁴-benzo[d]isothiazol-5-yl)-N-ethyl-N-methylformimidamide; N'-(4-chloro-1-(4-chlorobenzyl)-1-oxido-3-oxo-3H-1λ⁴-benzo[d]isothiazol-5-yl)-N-ethyl-N-methylformimidamide; N'-(6-chloro-1-(4-chlorobenzyl)-1-oxido-3-oxo-3H-1λ⁴-benzo[d]isothiazol-5-yl)-N-ethyl-N-methylformimidamide; N'-(4-chloro-1-(4-fluorobenzyl)-1-oxido-3-oxo-3H-1λ⁴-benzo[d]isothiazol-5-yl)-N-ethyl-N-methylformimidamide; N'-(6-chloro-1-(4-fluorobenzyl)-1-oxido-3-oxo-3H-1λ⁴-benzo[d]isothiazol-5-yl)-N-ethyl-N-methylformimidamide; N-ethyl-N-methyl-N'-(1-oxido-3-oxo-1-(4-(trifluoromethoxy)benzyl)-3H-1λ⁴-benzo[d]isothiazol-5-yl)formimidamide; N-ethyl-N-methyl-N'-(1-oxido-3-oxo-1-(3-(trifluoromethyl)benzyl)-3H-1λ⁴-benzo[d]isothiazol-5-yl)formimidamide;

Claim 5: The compounds of general formula (I) according to claim 1, in a composition with one or more inert carriers for controlling or preventing phytopathogenic microorganisms.

Claim 6: The compounds of general formula (I) according to claim 1 in a composition comprising one or more active compatible compounds selected from fungicides, insecticides, nematicides, acaricides, biopesticides, herbicides, plant growth regulators, antibiotics, fertilizers and or mixtures thereof.

Claim 7: The compounds of general formula (I) according to claim 1 in a composition, wherein the concentration of compounds having general formula (I) ranges from 1 to 90% by weight with respect to the total weight of the composition, preferably from 5 to 50% by weight with respect to the total weight of the composition.

Claim 8: Use of the compounds of general formula (I) according to claim 1 or its composition according to claim 6 for the control of phytopathogenic fungi, bacteria, insects, nematodes, mites of agricultural crops and or horticultural crops.

Claim 9: Use of the compounds of general formula (I) according to claim 1 for controlling or preventing against phytopathogenic fungi of agricultural crops and or horticultural crops.

Claim 10: Use of compounds of general formula (I) according to claim 1, or compositions according to

claim 5, for controlling rust diseases of different crops.

Claim 11: Use of compounds of general formula (I) according to claim 1, or compositions according to claim 5, wherein the rust diseases of crops are *Hemileia vastatrix* (Coffee rust), *Uromyces appendiculatus/fabae/ phaseoli* (rust of beans) *Puccinia spp.* (rusts) on various plants, selected from *P. triticina* (brown or leaf rust), *P. striiformis* (stripe or yellow rust), *Puccinia melanocephala (sugarcane rust), P. hordei*(dwarf rust), *P. graminis* (stem or black rust) or *P. recondita* (brown or leaf rust), on cereals, selected from wheat, barley or rye and *Phakopsora spp.* on various plants, in particular *Phakopsora pachyrhizi* and *P. meibomiae* (soybean rust) on soybeans.

Claim 12: Use of compounds of general formula (I) according to claim 1, or compositions according to claim 5, for controlling or preventing against phytopathogenic fungi selected from *Phakopsora pachyrhizi, Phakopsora meibomiae*, of agricultural crops and or horticultural crops.

Claim 13: Use of compounds of general formula (I) according to claim 1, wherein the agricultural crops are cereals, corn, rice, soybean and other leguminous plants, fruits and fruit trees, nuts and nut trees, citrus and citrus trees, horticultural plants, cucurbitaceae, oleaginous plants, tobacco, coffee, tea, cacao, sugar beet, sugar cane, cotton, potato, tomato, onions, peppers and other vegetables, and ornamentals.

Claim 14: A method of controlling or preventing infestation of useful plants by phytopathogenic microorganisms in agricultural crops and or horticultural crops wherein the compounds of general formula (I) according to claim 1 is applied to the plants, to parts thereof or the locus thereof.

Claim 15: A method of controlling or preventing infestation of useful plants by phytopathogenic microorganisms in agricultural crops and or horticultural crops wherein the compounds of general formula (I) according to claim 1 is applied to the seeds of plants.

Claim 16: A method of controlling or preventing phytopathogenic microorganisms in agricultural crops and or horticultural crops using the compounds of general formula (I) according to claim 1 or compositions according to claim 5, which consists in applying effective dosages of compounds or compositions in amounts ranging from 1 g to 5 kg per hectare of agricultural or horticultural crops.

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2018/053456

A. CLASSIFICATION OF SUBJECT MATTER
INV. C07D213/75 A01N41/02 A01N43/40 A01N43/56 C07D213/83
C07D231/14 C07D275/06 C07C381/10
ADD.
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
C07D A01N C07C

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

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2014/336108 A1 (GUO XIALING [US] ET AL) 13 November 2014 (2014-11-13) page 38	1
A	WO 00/46184 A1 (HOECHST SCHERING AGREVO GMBH [DE]; CHARLES MARK DAVID [GB]; FRANKE WIL) 10 August 2000 (2000-08-10) cited in the application claim 1	1-16
A	WO 2007/031513 A1 (BAYER CROPSCIENCE AG [DE]; KUNZ KLAUS [DE]; GREUL JOERG [DE]; GUTH OLI) 22 March 2007 (2007-03-22) cited in the application claims 1,9	1-16

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

[X] See patent family annex.

* Special categories of cited documents :

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

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

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

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

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

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

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

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
28 August 2018	02/11/2018

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Schuemacher, Anne

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Form PCT/ISA/210 (second sheet) (April 2005)

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 2 738 163 A1 (TAISHO PHARMA CO LTD [JP]; TOYAMA CHEMICAL CO LTD [JP]) 4 June 2014 (2014-06-04) cited in the application claims 1,8 -----	1-16

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/IB2018/053456

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2014336108 A1	13-11-2014	US 2014336108 A1	13-11-2014
		US 2016355527 A1	08-12-2016
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/IB2018/053456

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		RU 2014107744 A	10-09-2015
		US 2014155597 A1	05-06-2014
		WO 2013018735 A1	07-02-2013

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB2018/053456

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-16(partially)

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-16(partially)

   compounds of formula (I) according to claim 1 characterized by L=O, S, NR'',CR5R6

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2. claims: 1-16(partially)

   compounds of formula (I) according to claim 1 characterized by L=T
