

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43*bis*.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/EP2018/055042

International filing date (day/month/year)
01.03.2018

Priority date (day/month/year)
03.03.2017

International Patent Classification (IPC) or both national classification and IPC
INV. C07D413/14 A01N43/72 C07D413/04 C07D417/14 C07D471/04

Applicant
SYNGENTA PARTICIPATIONS AG

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA:



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Tel. +49 89 2399 - 0
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Date of completion of
this opinion

see form
PCT/ISA/210

Authorized Officer

Kirsch, Cécile

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Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of:
 - ☒ the international application in the language in which it was filed.
 - ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1 (b)).
2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43bis.1(a))
3. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing:
 - a. ☐ forming part of the international application as filed:
 - ☐ in the form of an Annex C/ST.25 text file.
 - ☐ on paper or in the form of an image file.
 - b. ☐ furnished together with the international application under PCT Rule 13ter.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.
 - c. ☐ furnished subsequent to the international filing date for the purposes of international search only:
 - ☐ in the form of an Annex C/ST.25 text file (Rule 13ter.1(a)).
 - ☐ on paper or in the form of an image file (Rule 13ter.1(b) and Administrative Instructions, Section 713).
4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5. Additional comments:

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	<u>1-15</u>
	No: Claims	
Inventive step (IS)	Yes: Claims	<u>1-15</u>
	No: Claims	
Industrial applicability (IA)	Yes: Claims	<u>1-15</u>
	No: Claims	

2. Citations and explanations

see separate sheet

Reference is made to the following documents:

D1: WO 2015/185485

D2: EP 0 276 432

D3: WO 2009/029632

The present application deals with 3-thienyl-5-(trifluoromethyl)-1,2,4-oxadiazole derivatives with antifungal activity.

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Claim 15 relates to subject-matter considered by this Authority to be covered by the provisions of Rule 39.1(iv) / 67.1(iv) PCT.

The patentability can be dependent upon the formulation of the claims. The EPO, for example, does not recognise as patentable claims to the use of a compound in medical treatment, but may allow claims to a product, in particular substances or compositions for use in a first or further medical treatment.

Patentability, in particular novelty and inventive step, of claim 15 has been assessed on the basis of a purpose-limited product claim taking into account the alleged effects of the compound/composition.

1. Novelty, Article 33(2) PCT

D1 discloses 5-(trifluoromethyl)-1,2,4-oxadiazole derivatives for combating phytopathogenic fungi which differ from the present claimed compounds due to the presence of a carboxylic or carboxamide group (see definition of -C(=Y)-W).

D2 discloses 5-(trifluoromethyl)-1,2,4-oxadiazole derivatives for use as fungicides which differ from the present claimed compounds due to the presence of a phenyl ring in place of the thienyl ring of the application.

D3 discloses heterocyclic compounds with MAO inhibiting activity for treating CNS disorders. According to formula (I) of D3, the compounds of D3 overlap with the present claimed subject-matter when the 5-membered ring is oxadiazole, B is a thiophene, X is CR⁴₂ and Y is R⁴ whereby R⁴ may be heterocycle or heteroaryl. Example 10 of D3 discloses a closely related alternative thereof which differs from the

claimed subject-matter due to the carbonyl group. Thus D3 fails to disclose all alternatives in combination and the specific combination of structural features represents a new teaching which serves to establish novelty.

Claims 1 to 15 are considered novel with regard to the cited prior art.

2. Inventive step, Article 33(3) PCT

Document D1 represents the closest prior art. Document D1 discloses 5-(trifluoromethyl)-1,2,4-oxadiazole derivatives for combating phytopathogenic fungi. The compounds of D1 requires the presence of a carboxyl or carboxamide group and differ therefore from the claimed subject-matter.

The problem to be solved may be seen in the provision of further 5-(trifluoromethyl)-1,2,4-oxadiazole derivatives for combating phytopathogenic fungi.

On the basis of the results of biological 1 to 4 of the description, this problem is considered as solved.

The solution proposed in the present application consists in the use of a methylene linker between the thiophene ring and the heterocycle Z instead of the known carboxy/carboxamide group.

The available provides no incentive to replace the carboxy/carboxamide group by a methylene group. Since the carboxy/carboxamide group is common to all compounds of D1, it would be seen by the skilled person as essential to the activity. Thus modification of this feature is not seen as obvious by the skilled person.

Document D2 which also deals with fungicide discloses neither the use of a methylene linker nor the presence of a further heterocycle. Therefore, the skilled person is not prompted by D2 to modify the compounds as proposed in the application.

The claimed subject-matter is therefore considered inventive in the light of the cited prior art.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 81268-WO-ORG-P1	FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. PCT/EP2018/055042	International filing date (<i>day/month/year</i>) 1 March 2018 (01-03-2018)	(Earliest) Priority Date (<i>day/month/year</i>) 3 March 2017 (03-03-2017)
Applicant SYNGENTA PARTICIPATIONS AG		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 3 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the **language**, the international search was carried out on the basis of:

- ☒ the international application in the language in which it was filed
☐ a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))

b. ☐ This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6**bis**(a)).

c. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (See Box No. II)

3. ☐ **Unity of invention is lacking** (see Box No III)

4. With regard to the **title**,

- ☒ the text is approved as submitted by the applicant
☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

- ☒ the text is approved as submitted by the applicant
☐ the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority

6. With regard to the **drawings**,

- a. the figure of the **drawings** to be published with the abstract is Figure No. _____
☐ as suggested by the applicant
☐ as selected by this Authority, because the applicant failed to suggest a figure
☐ as selected by this Authority, because this figure better characterizes the invention
- b. ☐ none of the figures is to be published with the abstract

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2018/055042

A. CLASSIFICATION OF SUBJECT MATTER
INV. C07D413/14 A01N43/72 C07D413/04 C07D417/14 C07D471/04
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

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, BIOSIS, CHEM ABS Data, EMBASE, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2015/185485 A1 (BASF SE [DE]) 10 December 2015 (2015-12-10) cited in the application Formula (I); Table A, groupe A-3; claims; examples -----	1-15
A	EP 0 276 432 A2 (CIBA GEIGY AG [CH]) 3 August 1988 (1988-08-03) Formula (I); claims; examples -----	1-15
A	WO 2009/029632 A1 (HELICON THERAPEUTICS INC [US]; KAPLAN ALAN P [US]; KEENAN TERENCE P [U]) 5 March 2009 (2009-03-05) Formula (I); claims; example 10 -----	1-15



Further documents are listed in the continuation of Box C.



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

6 April 2018

Date of mailing of the international search report

02/05/2018

Name and mailing address of the ISA/

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Authorized officer

Kirsch, Cécile

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2018/055042

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2015185485	A1	10-12-2015	AR 100770 A1 02-11-2016
		AU 2015270651 A1 22-12-2016	
		CA 2950084 A1 10-12-2015	
		CN 106455572 A 22-02-2017	
		EP 3151669 A1 12-04-2017	
		US 2017144980 A1 25-05-2017	
		WO 2015185485 A1 10-12-2015	
EP 0276432	A2	03-08-1988	AU 8246587 A 16-06-1988
		BR 8706756 A 19-07-1988	
		DK 650787 A 13-06-1988	
		EP 0276432 A2 03-08-1988	
		NZ 222868 A 26-09-1990	
		PT 86329 A 01-01-1988	
		US 4871753 A 03-10-1989	
WO 2009029632	A1	05-03-2009	AU 2008293542 A1 05-03-2009
		AU 2014202864 A1 19-06-2014	
		CA 2696609 A1 05-03-2009	
		CA 2974477 A1 05-03-2009	
		CN 101820764 A 01-09-2010	
		CN 104072489 A 01-10-2014	
		EP 2182809 A1 12-05-2010	
		EP 3311813 A1 25-04-2018	
		HK 1147938 A1 19-06-2015	
		IL 203910 A 30-06-2014	
		IL 226702 A 24-09-2015	
		JP 5718053 B2 13-05-2015	
		JP 6250746 B2 20-12-2017	
		JP 2010538001 A 09-12-2010	
		JP 2015110666 A 18-06-2015	
		JP 2017002062 A 05-01-2017	
		KR 20100046060 A 04-05-2010	
		KR 20150059810 A 02-06-2015	
		US 2009062252 A1 05-03-2009	
		US 2012202786 A1 09-08-2012	
		US 2013053361 A1 28-02-2013	
		US 2015336941 A1 26-11-2015	
		US 2017204111 A1 20-07-2017	
		WO 2009029632 A1 05-03-2009	

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(PCT Rule 92*bis*.1 and
Administrative Instructions, Section 422)

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4058 Basel

Date of mailing (day/month/year) 09 August 2019 (09.08.2019)	
Applicant's or agent's file reference 81268-WO-ORG-P1	IMPORTANT NOTIFICATION
International application No. PCT/EP2018/055042	International filing date (day/month/year) 01 March 2018 (01.03.2018)

☒ the applicant ☐ the inventor ☐ the agent ☐ the common representative

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☐ the person ☐ the name ☒ the address ☐ the nationality ☐ the residence

Name and Address SYNGENTA PARTICIPATIONS AG Rosentalstrasse 67 4058 Basel Switzerland	State of Nationality CH	State of Residence CH
	Telephone No.	
	Facsimile No.	
	E-mail address global.patents@syngenta.com ☐ Notifications by e-mail authorized	

☒	the receiving Office
☒	the International Searching Authority
☐	the Authority(ies) specified for supplementary search

☐	the International Preliminary Examining Authority
☒	the designated Offices concerned
☐	the elected Offices concerned
☐	other:

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer Malek David e-mail pct.team5@wipo.int Telephone No. +41 22 338 74 05
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(51) International Patent Classification:

C07D 413/14 (2006.01) C07D 417/14 (2006.01)

A01N 43/72 (2006.01) C07D 471/04 (2006.01)

C07D 413/04 (2006.01)

(21) International Application Number:

PCT/EP2018/055042

(22) International Filing Date:

01 March 2018 (01.03.2018)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

17159202.5 03 March 2017 (03.03.2017) EP

17160411.9 10 March 2017 (10.03.2017) EP

201711043196 01 December 2017 (01.12.2017) IN

(71) Applicant: SYNGENTA PARTICIPATIONS AG
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(72) Inventors: HOFFMAN, Thomas, James; Syngenta Crop Protection AG, Schaffhauserstrasse, 4332 Stein (CH). STIERLI, Daniel; Syngenta Crop Protection AG, Schaffhauserstrasse, 4332 Stein (CH). PITTERNA, Thomas; Syngenta Crop Protection AG, Schaffhauserstrasse, 4332 Stein (CH). RAJAN, Ramya; Syngenta Biosciences Private Limited Santa Monica Works, Corlim Ilhas, Goa 403 110 (IN).

(74) Agent: SYNGENTA INTERNATIONAL AG; Schwarzwaldallee 215 (WRO B4-8-152), 4058 Basel (CH).

(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).

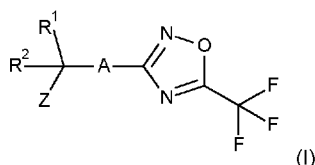
Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- of inventorship (Rule 4.17(iv))

Published:

- with international search report (Art. 21(3))

(54) Title: MICROBIOCIDAL OXADIAZOLE DERIVATIVES



(57) Abstract: Compounds of the formula (I) wherein the substituents are as defined in claim 1, useful as pesticides, especially as fungicides.

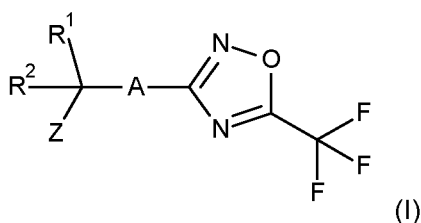


Microbiocidal Oxadiazole Derivatives

The present invention relates to microbiocidal oxadiazole derivatives, e.g., as active ingredients, which have microbiocidal activity, in particular, fungicidal activity. The invention also relates to agrochemical compositions which comprise at least one of the oxadiazole derivatives, to processes of preparation of these compounds and to uses of the oxadiazole derivatives or compositions in agriculture or horticulture for controlling or preventing infestation of plants, harvested food crops, seeds or non-living materials by phytopathogenic microorganisms, preferably fungi.

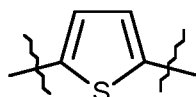
WO 2015/185485 describes the use of substituted oxadiazoles for combating phytopathogenic fungi.

According to the present invention, there is provided a compound of Formula (I):

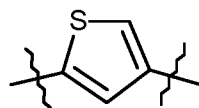


wherein

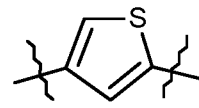
A is selected from A-1, A-2 or A-3;



(A-1)



(A-2)



(A-3)

R¹ and R² independently represent hydrogen, methyl, ethyl, fluoro, cyano, difluoromethyl or trifluoromethyl; and

Z is selected from Z¹, Z² or Z³; wherein

Z¹ represents a 4- to 6-membered non-aromatic heterocyclyl ring containing 1 ring nitrogen, wherein the heterocyclyl optionally comprises 1 or 2 additional ring members independently selected from N, O, S, C(O) and S(O)₂ with the proviso that the heterocyclyl ring cannot contain 2 contiguous atoms selected from O and S, or the heterocyclyl optionally comprises 1 additional ring member NR³, wherein the heterocyclyl is optionally substituted by 1 or 2 substituents, which may be the same or different, selected from R⁴, and wherein further the heterocyclyl is bound to the rest of the molecule through a ring nitrogen;

R³ represents hydrogen, hydroxy, amino, formyl, C₁₋₃alkyl, C₁₋₃alkoxy, C₁₋₃alkylcarbonyl, C₁₋₃alkoxycarbonyl, N-C₁₋₃alkylaminocarbonyl, N,N-diC₁₋₃alkylaminocarbonyl, N-C₁₋₃alkoxyaminocarbonyl,

N-C₁₋₃alkyl-N-C₁₋₃alkoxy-aminocarbonyl, C₁₋₂alkylsulfonyl, N-C₁₋₂alkylaminosulfonyl, N,N-diC₁₋₂alkylaminosulfonyl, C₁₋₂alkyldicarbonyl, C₁₋₂alkoxydicarbonyl, N-C₁₋₂alkylaminodicarbonyl or N,N-diC₁₋₂alkylaminodicarbonyl;

- 5 R⁴ represents cyano, halogen, hydroxy, amino, methyl, ethyl, difluoromethyl, trifluoromethyl, methoxy, N-methylamino or N,N-dimethylamino;

- Z² represents a 5- or 6-membered heteroaryl ring containing 1 ring nitrogen, wherein the heteroaryl optionally comprises 1, 2 or 3 additional ring members independently selected from O, S, or
10 N, and wherein the heteroaryl is optionally substituted by: 1 or 2 substituents selected from R⁵, 1 substituent selected from R⁶, or 1 substituent selected from R⁵ and 1 substituent selected from R⁶, and wherein further the heteroaryl is bound to the rest of the molecule through a ring nitrogen;

- R⁵ represents hydroxyl, amino, cyano, halogen, formyl, nitro, C₁₋₄alkyl, C₁₋₄alkoxy, C₃₋₄alkenyl, C₃₋₄alkynyl, C₃₋₄alkenyloxy, C₃₋₄alkynyloxy, cyanoC₁₋₂alkyl, C₁₋₂haloalkyl, hydroxyC₁₋₂alkyl, C₁₋₂alkoxyC₁₋₂alkyl, C₁₋₂alkoxyC₁₋₂alkoxyC₁₋₂alkyl, N,N-dimethylamino, C₁₋₃alkoxycarbonylC₁₋₂alkyl, C₁₋₃alkylcarbonyloxyC₁₋₂alkyl, N-C₁₋₃alkylaminocarbonylC₁₋₂alkyl, N,N-diC₁₋₃alkylaminocarbonylC₁₋₂alkyl, C₁₋₂alkylsulfonyl, C₁₋₃alkylcarbonyl, C₁₋₃alkyldicarbonyl, C₁₋₃alkoxydicarbonyl, N-C₁₋₃alkylaminodicarbonyl, or N,N-diC₁₋₃alkylaminodicarbonyl; or

20

R⁵ represents -C(O)N(R^a)(R^b) wherein:

- R^a represents hydrogen, C₁₋₆alkyl, C₃₋₄alkenyl, C₃₋₄alkynyl, C₁₋₃haloalkyl, C₃₋₄haloalkenyl, C₁₋₄alkoxy, C₁₋₂alkoxyC₁₋₃alkyl, C₂₋₃haloalkoxy, C₃₋₄alkenyloxy, C₃₋₄alkynyloxy, N-C₁₋₃alkylamino, or N,N-diC₁₋₂alkylamino; or

25

- R^a represents C₃₋₅cycloalkyl, C₃₋₅cycloalkylC₁₋₂alkyl, phenyl, phenylC₁₋₂alkyl, heterocyclyl, wherein the heterocyclyl moiety is a 4- to 6-membered non-aromatic ring which comprises 1 or 2 heteroatoms independently selected from N, O or S, with the proviso that the heterocyclyl cannot
30 contain 2 contiguous atoms selected from O and S, heteroaryl or heteroarylC₁₋₂alkyl, wherein the heteroaryl moiety is a 5- or 6-membered aromatic ring which comprises 1, 2, 3, or 4 heteroatoms individually selected from N, O and S; wherein the cycloalkyl, phenyl, heterocyclyl or heteroaryl is optionally substituted by 1 or 2 substituents, which may be the same or different, selected from hydroxyl, amino, formyl, acyl, cyano, halogen, methyl, trifluoromethyl, methoxy, or N,N-dimethylamino, and
35 wherein when R^a represents cycloalkyl or heterocyclyl, these cycles optionally contain 1 group selected from C(O) or S(O)₂; and

- R^b represents hydrogen, methyl, ethyl, propyl, prop-2-enyl, prop-2-ynyl, cyclopropyl, or cyclopropylmethyl; or

40

R^a and R^b, together with the nitrogen atom they share, form an azetidiny, pyrrolidiny, isooxazolidiny, morpholino, piperazin-4-yl, or piperidiny ring optionally substituted by 1 or 2 groups selected from halogen, methyl, ethyl or methoxy; or

5 R⁵ represents -C(O)O-R^c, wherein:

R^c represents hydrogen, C₁₋₆alkyl, C₃₋₅alkenyl, C₃₋₅alkynyl, C₁₋₃haloalkyl, C₃₋₄haloalkenyl, N,N-diC₁₋₃alkylaminoC₁₋₃alkyl, C₃₋₆cycloalkyl, C₃₋₄cycloalkylC₁₋₂alkyl, phenyl, heterocyclyl, wherein the heterocyclyl moiety is a 4- to 6-membered non-aromatic ring which comprises 1 or 2 heteroatoms independently selected from O, S and N, with the proviso that the heterocyclyl cannot contain 2 contiguous atoms selected from O and S, heteroaryl, wherein the heteroaryl moiety is a 5- or 6-membered aromatic ring which comprises 1, 2 or 3 heteroatoms individually selected from N, O and S; and wherein the cycloalkyl, phenyl, heterocyclyl or heteroaryl is optionally substituted by 1 or 2 substituents, which may be the same or different, selected from hydroxyl, amino, formyl, methylcarbonyl, cyano, halogen, methyl, trifluoromethyl, methoxy, or N,N-dimethylamino, and wherein when R^c represents cycloalkyl or heterocyclyl, these cycles optionally contain 1 group selected from C(O) or S(O)₂; or

20 R⁵ represents -N(R^d)(R^e) or -C₁₋₂alkyl-N(R^d)(R^e), wherein

R^d represents C₁₋₃alkyl, C₃₋₄alkenyl, C₃₋₄alkynyl, methylcarbonyl, methoxycarbonyl, N-methylaminocarbonyl, N,N-dimethylaminocarbonyl, N-methoxyaminocarbonyl, N-methyl-N-methoxyaminocarbonyl, methylsulfonyl, N-methylaminosulfonyl, N,N-dimethylaminosulfonyl, methyldicarbonyl, N-methylaminodicarbonyl, or N,N-dimethylaminodicarbonyl; and

25 R^e represents hydrogen, methyl, ethyl, or propyl; or

R^d and R^e, together with the nitrogen atom they share, form an azetidiny, pyrrolidiny, isooxazolidiny, morpholino, piperazin-4-yl, or piperidiny ring optionally substituted by 1 or 2 groups selected from halogen, methyl, ethyl or methoxy; or

R⁵ represents -CH=N(R^f), wherein R^f represents C₁₋₄alkyl, C₁₋₄alkoxy, C₂₋₄alkenoxy, or C₂₋₄alkynoxy;

35 R⁶ represents C₃₋₆cycloalkyl, phenyl, heteroaryl, wherein the heteroaryl moiety is a 5- or 6-membered aromatic ring which comprises 1, 2, 3 or 4 heteroatoms individually selected from N, O and S, heterocyclyl, wherein the heterocyclyl moiety is a 4- to 6-membered non-aromatic ring which comprises 1 or 2 heteroatoms individually selected from N, O and S, and wherein the cycloalkyl, phenyl, heteroaryl and heterocyclyl is optionally substituted by 1 or 2 substituents, which may be the same or different, selected from hydroxyl, amino, formyl, acyl, cyano, halogen, methyl, trifluoromethyl, methoxy,

N,N-dimethylamino, and wherein when R⁶ represents cycloalkyl or heterocyclyl, these cycles optionally contain 1 group selected from C(O) or S(O)₂;

and

Z³ represents a heterobicycyl which is a 7- to 9-membered saturated, partially saturated, or aromatic fused ring or saturated spirocyclic ring system containing 1 nitrogen, wherein the heterobicycyl optionally comprises 1 or 2 additional ring members independently selected from N, O, S, C(O) and S(O)₂ with the proviso that the heterobicycyl cannot contain 2 contiguous atoms selected from O and S, wherein the heterobicycyl is optionally substituted by 1 substituent selected from R⁷, and wherein further the heterobicycyl is bound to the rest of the molecule through a ring nitrogen; and

R⁷ is cyano, fluoro, chloro, amino, hydroxy, methyl, difluoromethyl, trifluoromethyl, methoxy, N,N-dimethylamino, formyl, methylcarbonyl, methoxycarbonyl, N-methylaminocarbonyl, or N,N-dimethylaminocarbonyl;

or a salt or N-oxide thereof.

Surprisingly, it has been found that the novel compounds of Formula (I) have, for practical purposes, a very advantageous level of biological activity for protecting plants against diseases that are caused by fungi.

According to a second aspect of the invention, there is provided an agrochemical composition comprising a fungicidally effective amount of a compound of Formula (I). Such an agricultural composition may further comprise at least one additional active ingredient and/or an agrochemically-acceptable diluent or carrier.

According to a third aspect of the invention, there is provided a method of controlling or preventing infestation of useful plants by phytopathogenic microorganisms, wherein a fungicidally effective amount of a compound of Formula (I), or a composition comprising this compound as active ingredient, is applied to the plants, to parts thereof or the locus thereof.

According to a fourth aspect of the invention, there is provided the use of a compound of Formula (I) as a fungicide. According to this particular aspect of the invention, the use may exclude methods for the treatment of the human or animal body by surgery or therapy.

As used herein, the term "halogen" or "halo" refers to fluorine (fluoro), chlorine (chloro), bromine (bromo) or iodine (iodo), preferably fluorine, chlorine or bromine.

As used herein, cyano means a -CN group.

As used herein, the term "hydroxyl" or "hydroxy" means an -OH group.

As used herein, amino means an -NH₂ group.

As used herein, acyl means a -C(O)CH₃ group.

As used herein, formyl means a -C(O)H group.

As used herein, the term "C₁₋₆alkyl" refers to a straight or branched hydrocarbon chain radical consisting solely of carbon and hydrogen atoms, containing no unsaturation, having from one to six carbon atoms, and which is attached to the rest of the molecule by a single bond. C₁₋₄alkyl, C₁₋₃alkyl and C₁₋₂alkyl are to be construed accordingly. Examples of C₁₋₆alkyl include, but are not limited to, methyl, ethyl, *n*-propyl, 1-methylethyl (isopropyl), *n*-butyl, and 1-dimethylethyl (*t*-butyl). A "C₁₋₂alkylene" group refers to the corresponding definition of C₁₋₂alkyl, except that such radical is attached to the rest of the molecule by two single bonds. Examples of C₁₋₂alkylene, are -CH₂- and -CH₂CH₂-.

As used herein, the term "C₁₋₄alkoxy" refers to a radical of the formula -OR_x where R_x is a C₁₋₄alkyl radical as generally defined above. The terms C₁₋₃alkoxy and C₁₋₂alkoxy are to be construed accordingly. Examples of C₁₋₄alkoxy include, but are not limited to, methoxy, ethoxy, propoxy, isopropoxy, and *t*-butoxy.

As used herein, the term "C₁₋₃haloalkyl" refers to a C₁₋₃alkyl radical as generally defined above substituted by one or more of the same or different halogen atoms. Examples of C₁₋₃haloalkyl include, but are not limited to fluoromethyl, fluoroethyl, difluoromethyl, trifluoromethyl, 2,2,2-trifluoroethyl, and 3,3,3-trifluoropropyl.

As used herein, the term "C₂₋₆alkenyl" refers to a straight or branched hydrocarbon chain radical group consisting solely of carbon and hydrogen atoms, containing at least one double bond that can be of either the (*E*)- or (*Z*)-configuration, having from two to six carbon atoms, which is attached to the rest of the molecule by a single bond. C₃₋₆alkenyl, C₃₋₅alkenyl, C₂₋₄alkenyl and C₂₋₃alkenyl are to be construed accordingly. Examples of C₂₋₆alkenyl include, but are not limited to, prop-1-enyl, allyl (prop-2-enyl), and but-1-enyl.

As used herein, the term "C₃₋₆haloalkenyl" refers to a C₃₋₆alkenyl radical as generally defined above substituted by one or more of the same or different halogen atoms. C₃₋₄haloalkenyl is to be construed accordingly.

As used herein, the term "C₂₋₄alkenoxy" refers to a radical of the formula -OR_x where R_x is a C₂₋₄alkenyl radical as generally defined above.

As used herein, the term "C₂₋₆alkynyl" refers to a straight or branched hydrocarbon chain radical group consisting solely of carbon and hydrogen atoms, containing at least one triple bond, having from two to six carbon atoms, and which is attached to the rest of the molecule by a single bond. C₃₋₆alkynyl and C₂₋₄alkynyl are to be construed accordingly. Examples of C₂₋₆alkynyl include, but are not limited to, prop-1-ynyl, propargyl (prop-2-ynyl).

As used herein, the term "C₂₋₄alkynoxy" refers to a radical of the formula -OR_x where R_x is a C₂₋₄alkynyl radical as generally defined above.

As used herein, the term "C₁₋₄alkoxyC₁₋₄alkyl" refers to radical of the formula R_y-O-R_x where R_y is a C₁₋₄alkyl radical as generally defined above, and R_x is a C₁₋₄alkylene radical as generally defined above.

As used herein, the term "hydroxyC₁₋₄alkyl" refers to a C₁₋₄alkyl radical as generally defined above substituted by one or more hydroxy groups. The term "hydroxyC₁₋₂alkyl" should be construed accordingly.

As used herein, the term "cyanoC₁₋₂alkyl" refers to refers to a C₁₋₂alkyl radical as generally defined above substituted by one or more cyano groups.

As used herein, the term "C₁₋₄alkylcarbonyl" refers to a radical of the formula -C(O)R_x where R_x is a C₁₋₄alkyl radical as generally defined above.

As used herein, the term "C₁₋₃alkyldicarbonyl" refers to a radical of the formula -[C(O)]₂R_x where R_x is a C₁₋₃alkyl radical as generally defined above.

As used herein, the term "C₁₋₃alkylcarbonyloxyC₁₋₂alkyl" refers to a radical of the formula R_yC(O)OR_x- where R_y is a C₁₋₃alkyl radical as generally defined above, and R_x is a C₁₋₂alkylene radical as generally defined above.

As used herein, the term "C₁₋₂alkoxyC₁₋₂alkoxyC₁₋₂alkyl" refers to a radical of the formula R_xOR_yOR_z-, where R_y and R_z are C₁₋₂alkylene radicals as generally defined above, and R_x is a C₁₋₂alkyl radical as generally defined above.

As used herein, the term "C₁₋₃alkoxyaminocarbonyl" refers to a radical of the formula R_xONHC(O)-, where R_x is a C₁₋₃alkyl radical as generally defined above.

As used herein, the term "N-C₁₋₃alkyl-N-C₁₋₃alkoxy-aminocarbonyl" refers to a radical of the formula (R_x)(R_xO)NHC(O)- where each R_x is a C₁₋₃alkyl radical as generally defined above.

As used herein, the term "C₁₋₃alkoxycarbonyl" refers to a radical of the formula R_xOC(O)-, where R_x is a C₁₋₃alkyl radical as generally defined above.

As used herein, the term "C₁₋₃alkoxycarbonylC₁₋₂alkyl" refers to a radical of the formula R_xOC(O)R_y-, where R_x is a C₁₋₃alkyl radical as generally defined above, and R_y is a C₁₋₂alkylene radical as generally defined above.

As used herein, the term "C₁₋₃alkoxydicarbonyl" refers to a radical of the formula R_xO[C(O)]₂-, where R_x is a C₁₋₃alkyl radical as generally defined above. The term C₁₋₂alkoxydicarbonyl should be construed accordingly.

As used herein, the term "C₁₋₂alkylsulfonyl" refers to a radical of the formula R_xS(O)₂-, where R_x is a C₁₋₂alkyl radical as generally defined above.

As used herein, the term "N-C₁₋₃alkylamino" refers to a radical of the formula R_xNH- where R_x is a C₁₋₃alkyl radical as generally defined above.

As used herein, the term "N,N-diC₁₋₂alkylamino" refers to a radical of the formula R_x(R_x)N- where R_x is a C₁₋₂alkyl radical as generally defined above.

As used herein, the term "N-C₁₋₂alkylaminosulfonyl" refers to a radical of the formula R_xNHS(O)₂- where R_x is a C₁₋₂alkyl radical as generally defined above.

As used herein, the term "N,N-diC₁₋₂alkylaminosulfonyl" refers to a radical of the formula R_x(R_x)NS(O)₂- where each R_x is independently a C₁₋₂alkyl radical as generally defined above.

As used herein, the term "C₁₋₃alkylaminocarbonyl" refers to a radical of the formula R_xNHC(O)- where R_x is a C₁₋₃alkyl radical as generally defined above.

As used herein, the term "N,N-diC₁₋₃alkylaminocarbonyl" refers to a radical of the formula (R_x)R_xNHC(O)- where each R_x is independently a C₁₋₃alkyl radical as generally defined above.

As used herein, the term "N-C₁₋₃alkylaminodicarbonyl" refers to a radical of the formula R_xNH[C(O)]₂- where R_x is a C₁₋₃alkyl radical as generally defined above.

As used herein, the term "N,N-diC₁₋₃alkylaminodicarbonyl" refers to a radical of the formula (R_x)R_xNH[C(O)]₂- where each R_x is independently a C₁₋₃alkyl radical as generally defined above. The term N,N-diC₁₋₂alkylaminodicarbonyl should be construed accordingly.

As used herein, the term "N,N-diC₁₋₃alkylaminocarbonylC₁₋₂alkyl" refers to a radical of the formula (R_x)R_xNHC(O)R_y- where each R_x is independently a C₁₋₃alkyl radical as generally defined above, and R_y is a C₁₋₂alkylene radical as generally defined above.

As used herein, the term "C₃₋₆cycloalkyl" refers to a stable, monocyclic ring radical which is saturated or partially unsaturated and contains 3 to 6 carbon atoms. C₃₋₅cycloalkyl and C₃cycloalkyl are to be construed accordingly. Examples of C₃₋₆cycloalkyl include, but are not limited to cyclopropyl, cyclobutyl, cyclopentyl, cyclopenten-1-yl, cyclopenten-3-yl, and cyclohexen-3-yl.

As used herein, the term "C₃₋₆cycloalkylC₁₋₂alkyl" refers to a C₃₋₆cycloalkyl ring as defined above attached to the rest of the molecule by a C₁₋₂alkylene radical as defined above. Examples of C₃₋₆cycloalkylC₁₋₃alkyl include, but are not limited to cyclopropyl-methyl and cyclobutyl-ethyl.

As used herein, the term "phenylC₁₋₂alkyl" refers to a phenyl ring attached to the rest of the molecule by a C₁₋₂alkylene radical as defined above. Examples of phenylC₁₋₂alkyl include, but are not limited to, benzyl.

As used herein, the term "heteroaryl" generally refers to a 5- or 6-membered monocyclic aromatic ring radical which comprises 1, 2, 3 or 4 heteroatoms individually selected from nitrogen, oxygen and sulfur. The heteroaryl radical is bonded to the rest of the molecule via a carbon atom or heteroatom. Examples of heteroaryl include but are not limited to, furyl, pyrrolyl, thienyl, pyrazolyl, imidazolyl, thiazolyl, oxazolyl, isoxazolyl, triazolyl, tetrazolyl, pyrazinyl, pyridazinyl, pyrimidyl, pyridyl, and indolyl.

As used herein, the term "heteroarylC₁₋₂alkyl" refers to a heteroaryl as generally defined above, attached to the rest of the molecule by a C₁₋₂alkylene radical as defined above.

As used herein, the term "heterocyclyl" or "heterocyclic" generally refers to a stable, saturated or partially saturated, 4- to 6-membered, non-aromatic monocyclic ring, which comprises 1, 2 or 3 heteroatoms individually selected from nitrogen, oxygen and sulfur. The heterocyclyl radical may be bonded to the rest of the molecule via a carbon atom or heteroatom. Examples of heterocyclyl include, but are not limited to, azetidiny, oxetanyl, pyrrolidyl, tetrahydrofuryl, tetrahydrothienyl, tetrahydrothiopyranyl, piperidiny, piperazinyl, tetrahydropyranyl, dioxolanyl, and morpholinyl.

As used herein, the term "heterobicyclyl" or "heterobicyclic" refers to a stable, 7- to 9-membered saturated, partially saturated or aromatic fused ring or saturated spirocyclic ring radical containing 1 nitrogen, which comprises 1 or 2 additional ring members individually selected from nitrogen, oxygen and sulfur. The heterobicyclyl radical is bonded to the rest of the molecule via a nitrogen atom. Examples of heterobicyclyl include, but are not limited to, pyrrolopyridine, benzimidazole.

The presence of one or more possible asymmetric carbon atoms in a compound of Formula (I) means that the compounds may occur in chiral isomeric forms, i.e., enantiomeric or diastereomeric forms. Also, atropisomers may occur as a result of restricted rotation about a single bond. Formula (I) is intended to include all those possible isomeric forms and mixtures thereof. The present invention includes all those possible isomeric forms and mixtures thereof for a compound of Formula (I). Likewise, Formula (I) is intended to include all possible tautomers (including lactam-lactim tautomerism and keto-enol tautomerism) where present. The present invention includes all possible tautomeric forms for a compound of Formula (I).

In each case, the compounds of Formula (I) according to the invention are in free form, in oxidized form as an N-oxide, in covalently hydrated form, or in salt form, e.g., an agronomically usable or agrochemically acceptable salt form.

N-oxides are oxidized forms of tertiary amines or oxidized forms of nitrogen containing heteroaromatic compounds. They are described for instance in the book "Heterocyclic N-oxides" by A. Albini and S. Pietra, CRC Press, Boca Raton 1991.

The following list provides definitions, including preferred definitions, for substituents A (A-1, A-2, A-3), R¹, R², Z (including Z¹, Z², Z³), R³, R⁴, R⁵ (including R^a, R^b, R^c, R^d, R^e, R^f), R⁶ and R⁷, with reference to the compounds of Formula (I) according to the invention. For any one of these substituents, any of the definitions given below may be combined with any definition of any other substituent given below or elsewhere in this document.

A is selected from A-1, A-2, and A-3. A-1 represents a 2,5-thienyl group, A-2 represents a 2,4-thienyl group, and A-3 represents a 3,5-thienyl group. Preferably, A is A-1.

R¹ and R² independently represent hydrogen, methyl, ethyl, fluoro, cyano, difluoromethyl or trifluoromethyl. Preferably, R¹ and R² independently represent hydrogen or methyl, more preferably R¹ and R² both represent hydrogen.

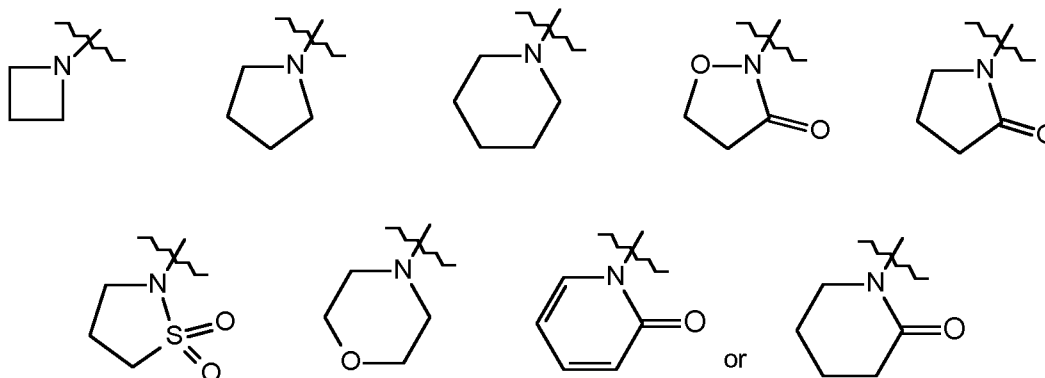
Z is selected from Z¹, Z², and Z³.

Z¹ represents a 4-, 5- or 6-membered non-aromatic heterocyclyl ring containing 1 ring nitrogen, wherein the heterocyclyl optionally comprises 1 or 2 additional ring members independently selected from N, O, S, C(O) and S(O)₂ with the proviso that the heterocyclyl cannot contain 2 contiguous atoms selected from O and S, or the heterocyclyl optionally comprises 1 additional ring member NR³, wherein the heterocyclyl is optionally substituted by 1 or 2 substituents, which may be the same or different, selected from R⁴, and wherein further the heterocyclyl is bound to the rest of the molecule through a ring nitrogen.

Preferably, Z¹ represents a 4-, 5- or 6-membered non-aromatic heterocyclyl containing 1 ring nitrogen, wherein the heterocyclyl optionally comprises 1 additional ring member independently

selected from N, O, S, C(O) or S(O)₂ (in particular, O or C(O)), wherein the heterocyclyl is optionally substituted by 1 or 2 substituents, which may be the same or different, selected from R⁴, and wherein further the heterocyclyl is bound to the rest of the molecule through a ring nitrogen.

5 More preferably, Z¹ is selected from:



wherein Z¹ is optionally substituted by 1 or 2 substituents, which may be the same or different, selected from R⁴.

10 In certain embodiments of the invention, Z¹ is optionally substituted by 1 substituent selected from R⁴.

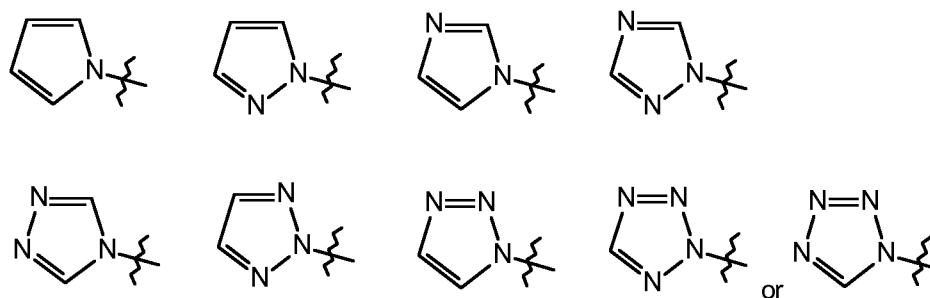
R³ represents hydrogen, hydroxy, amino, formyl, C₁₋₃alkyl, C₁₋₃alkoxy, C₁₋₃alkylcarbonyl, C₁₋₃alkoxycarbonyl, N-C₁₋₃alkylaminocarbonyl, N,N-diC₁₋₃alkylaminocarbonyl, N-C₁₋₃alkoxyaminocarbonyl, N-C₁₋₃alkyl-N-C₁₋₃alkoxy-aminocarbonyl, C₁₋₂alkylsulfonyl, N-C₁₋₂alkylaminosulfonyl, N,N-diC₁₋₂alkylaminosulfonyl, C₁₋₂alkyldicarbonyl, C₁₋₂alkoxydicarbonyl, N-C₁₋₂alkylaminodicarbonyl or N,N-diC₁₋₂alkylaminodicarbonyl.

20 R⁴ represents cyano, halogen, hydroxy, amino, methyl, ethyl, difluoromethyl, trifluoromethyl, methoxy, N-methylamino or N,N-dimethylamino. Preferably, R⁴ is selected from methyl or ethyl.

25 Z² represents a 5- or 6-membered heteroaryl ring containing 1 ring nitrogen, wherein the heteroaryl optionally comprises 1, 2 or 3 additional ring members independently selected from O, S, or N, and wherein the heteroaryl is optionally substituted by: 1 or 2 substituents selected from R⁵, 1 substituent selected from R⁶, or 1 substituent selected from R⁵ and 1 substituent selected from R⁶, and wherein further the heteroaryl is bound to the rest of the molecule through a ring nitrogen;

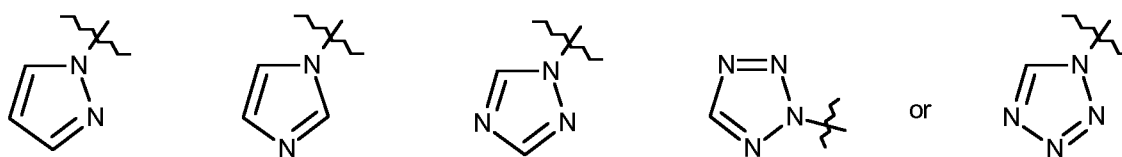
30 In certain preferred embodiments of the invention, Z² is optionally substituted by 1 or 2 substituents selected from R⁵, and most preferably is optionally substituted by a single substituent selected from R⁵.

Preferably, Z² is selected from:



wherein Z² is optionally substituted by: 1 or 2 substituents selected from R⁵, 1 substituent selected from R⁶, or 1 substituent selected from R⁵ and 1 substituent selected from R⁶.

5 More preferably, Z² is selected from:



wherein Z² is optionally substituted by: 1 or 2 substituents selected from R⁵, 1 substituent selected from R⁶, or 1 substituent selected from R⁵ and 1 substituent selected from R⁶.

10 R⁵ represents hydroxyl, amino, cyano, halogen, formyl, nitro, C₁₋₄alkyl, C₁₋₄alkoxy, C₃₋₄alkenyl, C₃₋₄alkynyl, C₃₋₄alkenyloxy, C₃₋₄alkynyloxy, cyanoC₁₋₂alkyl, C₁₋₂haloalkyl, hydroxyC₁₋₂alkyl, C₁₋₂alkoxyC₁₋₂alkyl, C₁₋₂alkoxyC₁₋₂alkoxyC₁₋₂alkyl, N,N-dimethylamino, C₁₋₃alkoxycarbonylC₁₋₂alkyl, C₁₋₃alkylcarbonyloxyC₁₋₂alkyl, N-C₁₋₃alkylaminocarbonylC₁₋₂alkyl, N,N-diC₁₋₃alkylaminocarbonylC₁₋₂alkyl, C₁₋₂alkylsulfonyl, C₁₋₃alkylcarbonyl, C₁₋₃alkyldicarbonyl, C₁₋₃alkoxydicarbonyl, N-C₁₋₃alkylaminodicarbonyl, or N,N-diC₁₋₃alkylaminodicarbonyl; or

R⁵ represents -C(O)N(R^a)(R^b), wherein:

20 R^a represents hydrogen, C₁₋₆alkyl, C₃₋₄alkenyl, C₃₋₄alkynyl, C₁₋₃haloalkyl, C₃₋₄haloalkenyl, C₁₋₄alkoxy, C₁₋₂alkoxyC₁₋₃alkyl, C₂₋₃haloalkoxy, C₃₋₄alkenyloxy, C₃₋₄alkynyloxy, N-C₁₋₃alkylamino, or N,N-diC₁₋₂alkylamino; or

25 R^a represents C₃₋₅cycloalkyl, C₃₋₅cycloalkylC₁₋₂alkyl, phenyl, phenylC₁₋₂alkyl, heterocyclyl, heterocyclylC₁₋₂alkyl, wherein the heterocyclyl moiety is a 4- to 6-membered non-aromatic ring which comprises 1 or 2 heteroatoms independently selected from N, O or S, with the proviso that the heterocyclyl cannot contain 2 contiguous atoms selected from O and S, heteroaryl or heteroarylC₁₋₂alkyl, wherein the heteroaryl moiety is a 5- or 6-membered aromatic ring which comprises 1, 2, 3, or 4 heteroatoms individually selected from N, O and S; wherein the cycloalkyl, phenyl, heterocyclyl or heteroaryl is optionally substituted by 1 or 2 substituents, which may be the same or different, selected from hydroxyl, amino, formyl, acyl, cyano, halogen, methyl, trifluoromethyl, methoxy, or N,N-

30

dimethylamino, and wherein when R^a represents cycloalkyl or heterocyclyl, these cycles optionally contain 1 group selected from $C(O)$ or $S(O)_2$; and

R^b represents hydrogen, methyl, ethyl, propyl, prop-2-enyl, prop-2-ynyl, cyclopropyl, or cyclopropylmethyl; or

R^a and R^b , together with the nitrogen atom they share, form an azetidiny, pyrrolidiny or piperidiny ring optionally substituted by 1 or 2 groups selected from halogen, methyl, ethyl or methoxy; or

R^5 represents $-C(O)O-R^c$, wherein:

R^c represents hydrogen, C_{1-6} alkyl, C_{3-5} alkenyl, C_{3-5} alkynyl, C_{1-3} haloalkyl, C_{3-4} haloalkenyl, N,N-di C_{1-3} alkylamino C_{1-3} alkyl, C_{3-6} cycloalkyl, C_{3-4} cycloalkyl C_{1-2} alkyl, phenyl, heterocyclyl, wherein the heterocyclyl moiety is a 4- to 6-membered non-aromatic ring which comprises 1 or 2 heteroatoms independently selected from O, S and N, with the proviso that the heterocyclyl cannot contain 2 contiguous atoms selected from O and S, heteroaryl, wherein the heteroaryl moiety is a 5- or 6-membered aromatic ring which comprises 1, 2 or 3 heteroatoms individually selected from N, O and S; and wherein the cycloalkyl, phenyl, heterocyclyl or heteroaryl is optionally substituted by 1 or 2 substituents, which may be the same or different, selected from hydroxyl, amino, formyl, methylcarbonyl, cyano, halogen, methyl, trifluoromethyl, methoxy, or N,N-dimethylamino, and wherein when R^c represents cycloalkyl or heterocyclyl, these cycles optionally contain 1 group selected from $C(O)$ or $S(O)_2$; or

R^5 represents $-N(R^d)(R^e)$ or $-C_{1-2}$ alkyl- $N(R^d)(R^e)$, wherein

R^d represents C_{1-3} alkyl, C_{3-4} alkenyl, C_{3-4} alkynyl, methylcarbonyl, methoxycarbonyl, N-methylaminocarbonyl, N,N-dimethylaminocarbonyl, N-methoxyaminocarbonyl, N-methyl-N-methoxyaminocarbonyl, methylsulfonyl, N-methylaminosulfonyl, N,N-dimethylaminosulfonyl, methyldicarbonyl, N-methylaminodicarbonyl, or N,N-dimethylaminodicarbonyl; and

R^e represents hydrogen, methyl, ethyl, or propyl; or

R^5 represents $-CH=N(R^f)$, wherein R^f represents C_{1-4} alkyl, C_{1-4} alkoxy, C_{2-4} alkenoxy, or C_{2-4} alkynoxy;

R^6 represents C_{3-6} cycloalkyl, phenyl, heteroaryl, wherein the heteroaryl moiety is a 5- or 6-membered aromatic ring which comprises 1, 2, 3 or 4 heteroatoms individually selected from N, O and S, heterocyclyl, wherein the heterocyclyl moiety is a 4- to 6-membered non-aromatic ring which comprises 1 or 2 heteroatoms individually selected from N, O and S, and wherein the cycloalkyl, phenyl,

heteroaryl and heterocyclyl is optionally substituted by 1 or 2 substituents, which may be the same or different, selected from hydroxyl, amino, formyl, acyl, cyano, halogen, methyl, trifluoromethyl, methoxy, N,N-dimethylamino, and wherein when R⁶ represents cycloalkyl or heterocyclyl, these cycles optionally contain 1 group selected from C(O) or S(O)₂.

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Preferably, R⁵ is independently selected from hydroxy, amino, cyano, halogen, formyl, nitro, C₁₋₄alkyl, C₁₋₄alkoxy, C₁₋₂haloalkyl, C₁₋₂alkoxyC₁₋₂alkyl, N,N-dimethylamino, -C(O)O-R^c wherein R^c is C₁₋₄alkyl, and -C(O)N(R^a)(R^b), wherein R^a is selected from hydrogen, C₁₋₄alkyl or C₁₋₄alkoxy, and R^b is selected from hydrogen or methyl, and R⁶ is phenyl optionally substituted by 1 or 2 substituents, which

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may be the same or different, selected from hydroxyl, methyl, methoxy, cyano, fluoro, chloro or bromo.

More preferably, R⁵ is selected from amino, cyano, chloro, fluoro, formyl, nitro, methyl, ethyl, difluoromethyl, methoxymethyl, N,N-dimethylamino, methoxycarbonyl, ethoxycarbonyl or n-propoxycarbonyl; or -C(O)N(R^a)(R^b) wherein R^a is selected from hydrogen, methyl or methoxy and R^b

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is selected from hydrogen or methyl, and R⁶ is phenyl optionally substituted by 1 or 2 substituents, which may be the same or different, selected from fluoro, chloro or bromo.

Z³ represents a heterobicycyl which is a 7- to 9-membered saturated, partially saturated, or aromatic fused ring or saturated spirocyclic ring system containing 1 nitrogen, wherein the heterobicycyl optionally comprises 1 or 2 additional ring members independently selected from N, O, S, C(O) and S(O)₂ with the proviso that the heterobicycyl cannot contain 2 contiguous atoms selected from O and S, wherein the heterobicycyl is optionally substituted by 1 substituent selected from R⁷, and wherein further the heterobicycyl is bound to the rest of the molecule through a ring nitrogen; and

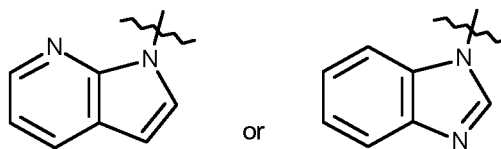
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Preferably, Z³ represents a heterobicycyl which is a 9-membered saturated, partially saturated, or aromatic fused ring system containing 1 nitrogen, wherein the heterobicycyl optionally comprises 1 additional ring member independently selected from N, O and S, wherein the heterobicycyl is optionally substituted by 1 substituent selected from R⁷, and wherein further the heterobicycyl is bound to the rest of the molecule through a ring nitrogen.

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More preferably, Z³ is selected from:



wherein Z³ is optionally substituted by 1 substituent selected from R⁷.

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R⁷ is cyano, fluoro, chloro, amino, hydroxy, methyl, difluoromethyl, trifluoromethyl, methoxy, N,N-dimethylamino, formyl, methylcarbonyl, methoxycarbonyl, N-methylaminocarbonyl, or N,N-

dimethylaminocarbonyl. Preferably, R^7 is selected from hydroxyl, methoxy, methyl cyano, fluoro or chloro.

Preferably, the compound according to Formula (I) is selected from a compound 1.1 to 1.190 listed in Table T1 (below).

Preferably, in a compound according to Formula (I) of the invention:

A is A-1;

R^1 is hydrogen and R^2 is hydrogen or methyl;

Z is Z^1 , wherein Z^1 represents a 4-, 5- or 6-membered non-aromatic heterocyclyl containing 1 ring nitrogen, wherein the heterocyclyl optionally comprises 1 additional ring member independently selected from N, O, S, C(O) or S(O)₂ (in particular, O or C(O)), wherein the heterocyclyl is optionally substituted by 1 or 2 substituents, which may be the same or different, selected from R^4 , and wherein further the heterocyclyl is bound to the rest of the molecule through a ring nitrogen; and

R^4 represents cyano, halogen, hydroxy, amino, methyl, ethyl, difluoromethyl, trifluoromethyl, methoxy, N-methylamino or N,N-dimethylamino.

More preferably,

A is A-1;

R^1 and R^2 are hydrogen;

Z is Z^1 , wherein Z^1 represents a 4-, 5- or 6-membered non-aromatic heterocyclyl containing 1 ring nitrogen, wherein the heterocyclyl optionally comprises 1 additional ring member independently selected from N, O, S, C(O) or S(O)₂ (in particular, O or C(O)), wherein the heterocyclyl is optionally substituted by 1 or 2 substituents, which may be the same or different, selected from R^4 , and wherein further the heterocyclyl is bound to the rest of the molecule through a ring nitrogen; and

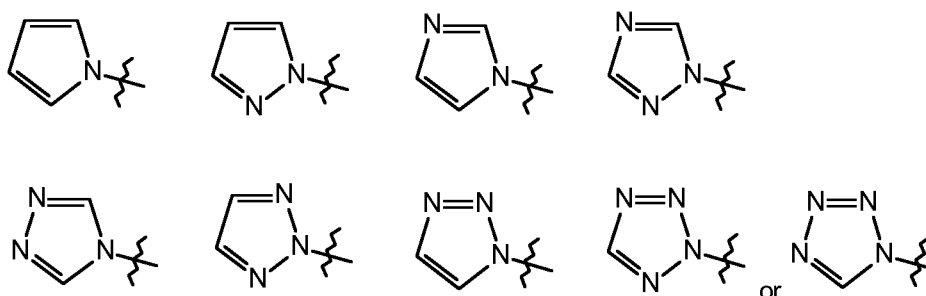
R^4 represents methyl or ethyl.

Preferably, in a compound according to Formula (I) of the invention:

A is A-1;

R^1 is hydrogen and R^2 is hydrogen or methyl; and

Z is Z^2 , wherein Z^2 is selected from:



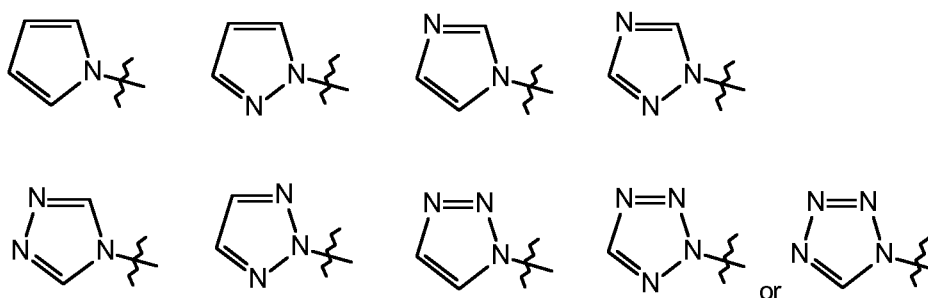
wherein Z^2 is optionally substituted by: 1 or 2 substituents selected from R^5 , 1 substituent selected from R^6 , or 1 substituent selected from R^5 and 1 substituent selected from R^6 .

More preferably,

A is A-1;

R^1 and R^2 are hydrogen; and

Z is Z^2 , wherein Z^2 is selected from:



wherein Z^2 is optionally substituted by: 1 or 2 substituents selected from R^5 or 1 substituent selected from R^6 .

Preferably, in a compound according to Formula (I) of the invention:

A is A-1;

R^1 is hydrogen and R^2 is hydrogen or methyl; and

Z is Z^3 , wherein Z^3 represents a heterobicycyl which is a 9-membered saturated, partially saturated, or aromatic fused ring system containing 1 nitrogen, wherein the heterobicycyl optionally comprises 1 additional ring member independently selected from N, O and S, wherein the heterobicycyl is optionally substituted by 1 substituent selected from R^7 , and wherein further the heterobicycyl is bound to the rest of the molecule through a ring nitrogen;

More preferably,

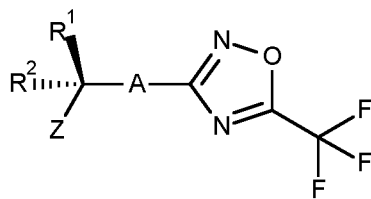
A is A-1;

R^1 and R^2 are hydrogen;

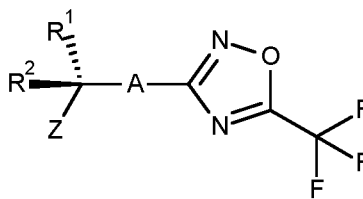
Z is Z^3 , wherein Z^3 represents a heterobicycyl which is a 9-membered saturated, partially saturated, or aromatic fused ring system containing 1 nitrogen, wherein the heterobicycyl optionally comprises 1 additional ring member independently selected from N, O and S, wherein the heterobicycyl is optionally substituted by 1 substituent selected from R^7 , and wherein further the heterobicycyl is bound to the rest of the molecule through a ring nitrogen; and

R^7 is selected from hydroxyl, methoxy, methyl cyano, fluoro or chloro.

The compounds of the present invention may be enantiomers of the compound of Formula (I) as represented by a Formula (Ia) or a Formula (Ib), wherein R^1 and R^2 are different substituents.

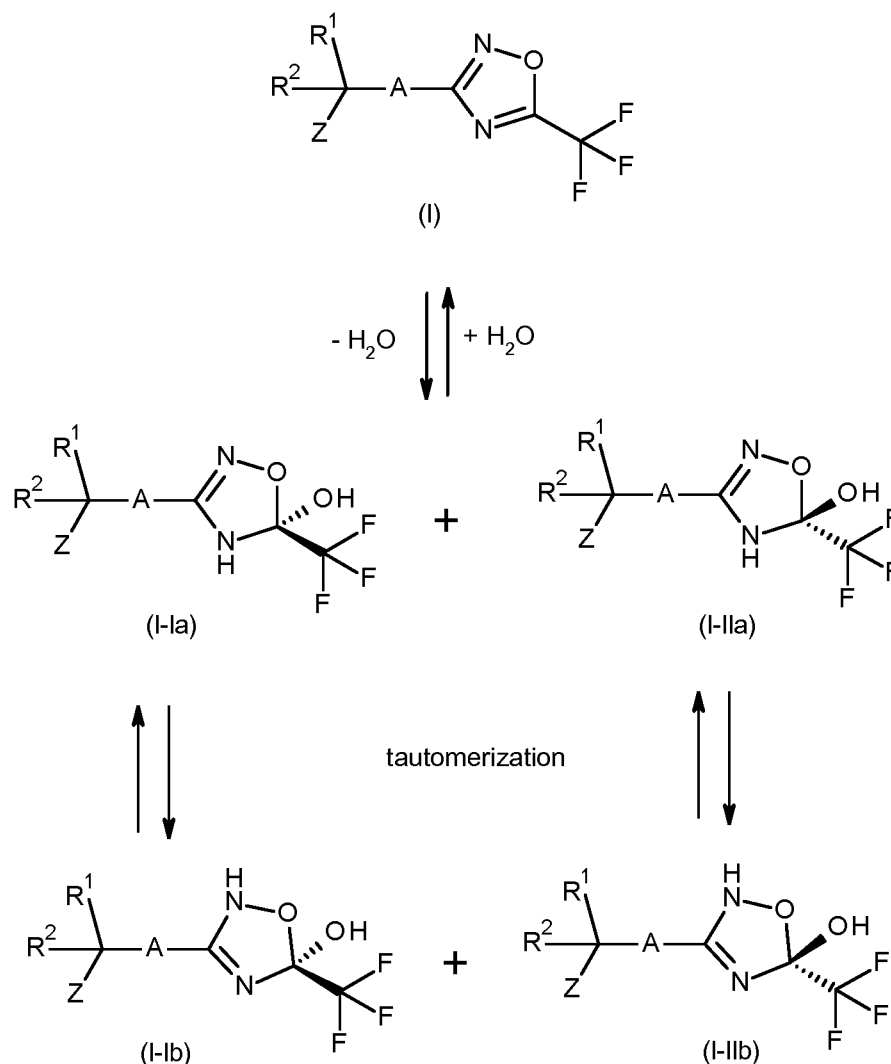


(Ia)



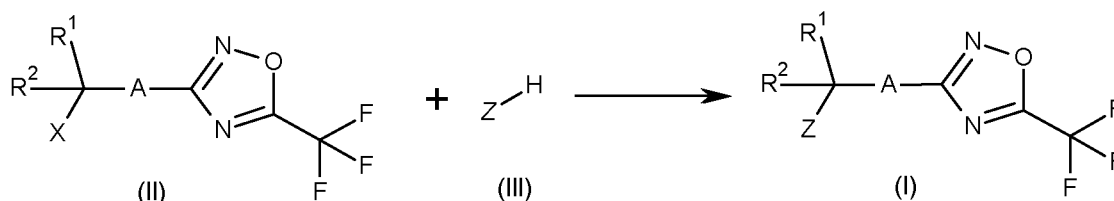
(Ib)

It is understood that when in aqueous media, the compounds of Formula (I) according to the invention may be present in a reversible equilibrium with the corresponding covalently hydrated forms (i.e., the compounds of Formula (I-Ia) and Formula (I-IIa) as shown below, which may exist in tautomeric form as the compounds of formula (I-Ib) and formula (I-IIb)) at the CF₃-oxadiazole motif. This dynamic equilibrium may be important for the biological activity of the compounds of Formula (I). The designations of A (A-1, A-2, A-3), R¹, R², Z (including Z¹, Z², Z³), R³, R⁴, R⁵ (including R^a, R^b, R^c, R^d, R^e, R^f), R⁶ and R⁷, with reference to the compounds of Formula (I) of the present invention apply generally to the compounds of Formula (I-Ia), Formula (I-Ib), Formula (I-IIa), and Formula (I-IIb), as well do the specific disclosures of combinations of A (A-1, A-2, A-3), R¹, R², Z (including Z¹, Z², Z³), R³, R⁴, R⁵ (including R^a, R^b, R^c, R^d, R^e, R^f), R⁶ and R⁷, as represented in Tables 1.1 to 1.3, Tables 2.1 and 2.2, or the compounds 1.1 to 1.190 according to the invention listed in Table T1 (below).



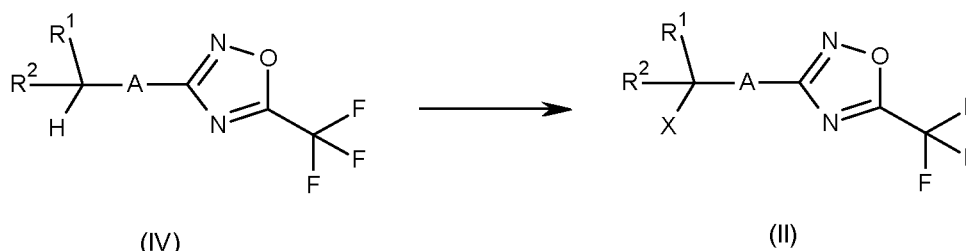
Compounds of the present invention can be made as shown in the following schemes 1 to 10, in which, unless otherwise stated, the definition of each variable is as defined above for a compound of Formula (I).

Compounds of Formula (I) can be prepared from compounds of Formula (II), wherein X is OSO_2CH_3 , Cl, Br, or I, *via* treatment with compounds of Formula (III), in the presence of a base (e.g. triethylamine, *N,N*-di-isopropylethylamine, K_2CO_3 , $NaHCO_3$, Na_2CO_3 , Cs_2CO_3 , or NaH) in a suitable solvent (e.g. dimethylacetamide, tetrahydrofuran, 2-methyltetrahydrofuran, acetone, toluene, or acetonitrile) at a temperature between $25^\circ C$ and $110^\circ C$. In some cases, a better reaction performance may be gained from the use of a catalyst (e.g., Bu_4NHSO_4 , Bu_4NBr , Bu_4NI , NaI, or 4-dimethylaminopyridine) and microwave irradiation. Furthermore, compounds of formula (I), can optionally be obtained *via* a coupling transformation with compounds of formula (III) and compounds of formula (II), wherein X is OH, *via* a process that converts the -OH into an improved leaving group, such as a $-OSO_2CH_3$ group, for example by using methanesulfonyl chloride ($ClSO_2Me$), prior to treatment with the compounds of formula (III). For related examples, see: WO 2013/132253, WO 2017/118689, and Garcia, M. *et al Org. Biomol. Chem.* (2004), 11, 1633. This reaction is shown in Scheme 1.



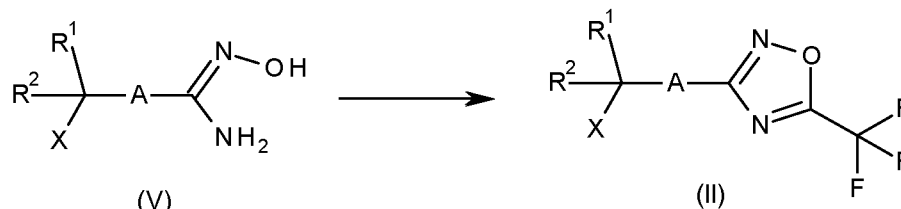
Scheme 1

Compounds of Formula (II), wherein X is halogen, preferably Cl or Br, can be prepared from compounds of Formula (IV) by treatment with a halogen source (e.g., N-bromosuccinimide (NBS) or N-chlorosuccinimide (NCS)) and a radical initiator (e.g., (PhCO₂)₂ or azobisisobutyronitrile (AIBN)) in a suitable solvent, such as tetrachloromethane, at temperatures between 55° and 100°C in the presence of ultraviolet light. For related examples, see Liu, S. *et al Synthesis* (2001), 14, 2078, WO 2017/118689, and Kompella, A. *et al Org. Proc. Res. Dev.* (2012), 16, 1794. This reaction is shown in Scheme 2.



Scheme 2

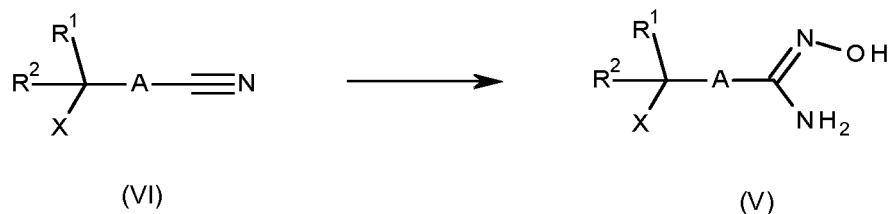
Alternatively, compounds of Formula (II), wherein X is hydrogen, OH, Cl, Br, or I, can be prepared from compounds of Formula (V) by treatment with trifluoroacetic anhydride or trifluoroacetyl halide (including trifluoroacetyl fluoride, trifluoroacetyl chloride and trifluoroacetyl bromide) in the presence of a base (e.g., pyridine or 4-dimethylaminopyridine) in a suitable solvent, (e.g., ethyl acetate, tetrahydrofuran, 2-methyl tetrahydrofuran, or ethanol), at a temperature between 0°C and 75°C. For related examples, see WO 2003/028729, WO 2017/055473, and WO 2010/045251. This reaction is shown in Scheme 3.



Scheme 3

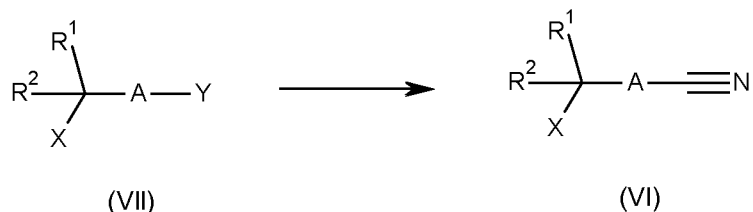
Compounds of Formula (V), wherein X is hydrogen, OH, or halogen, can be prepared from compounds of Formula (VI) by treatment with a hydroxylamine hydrochloride salt or a hydroxylamine solution in water, in the presence of a base, such as triethylamine or potassium carbonate, in a suitable solvent, such as methanol or ethanol, at a temperature between 0°C and 80°C. In some cases, a better

reaction performance may be gained from the use of a catalyst (e.g., 8-hydroxyquinoline). For related examples, see Kitamura, S. *et al Chem. Pharm. Bull.* (2001), 49, 268, WO 2017/055473 and WO 2013/066838. This reaction is shown in Scheme 4.



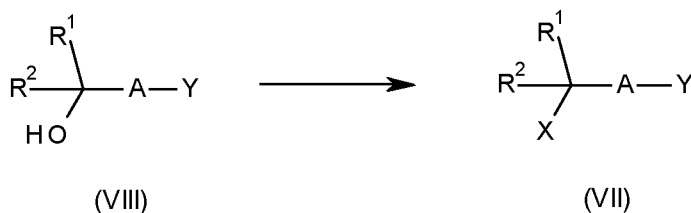
Scheme 4

Compounds of Formula (VI), can be prepared from compounds of Formula (VII), wherein Y is Cl, Br or I, *via* metal-promoted reaction with a suitable cyanide reagent, such as Pd(0)/Zn(CN)₂ or CuCN, in a suitable solvent (e.g., dimethylformamide or N-methylpyrrolidone) at elevated temperature between 100°C and 120°C. For related examples, see US 2007/0155739 and WO 2009/022746. This reaction is shown in Scheme 5.



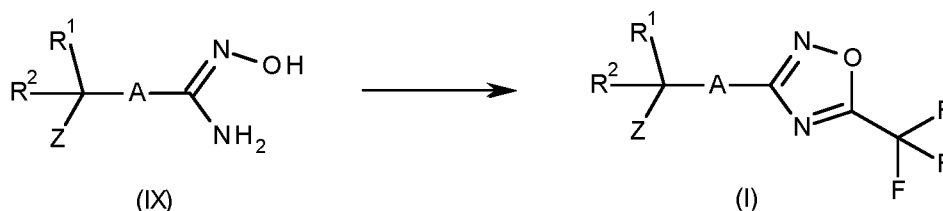
Scheme 5

Compounds of Formula (VII), wherein X is Cl, Br, I or OSO₂Me and Y is Cl, Br, I or CN, are either commercially available or can be prepared from compounds of Formula (VIII), *via* treatment with an acid source (e.g., hydrochloric acid, hydrobromic acid, or hydroiodic acid), or with a halogen source (e.g., CCl₃Br, CCl₄ or I₂) in the presence of triphenylphosphine, or with methanesulfonyl chloride (ClSO₂Me), in a suitable solvent, (e.g., dichloromethane) at a temperature between 0°C and 100°C. For related examples, see Liu, H. *et al Bioorg. Med. Chem.* (2008), 16, 10013, WO 2014/020350 and Kompella, A. *et al Bioorg. Med. Chem. Lett.* (2001), 1, 3161. Compounds of formula (VIII) are commercially available or prepared using known methods. This reaction is shown in Scheme 6.



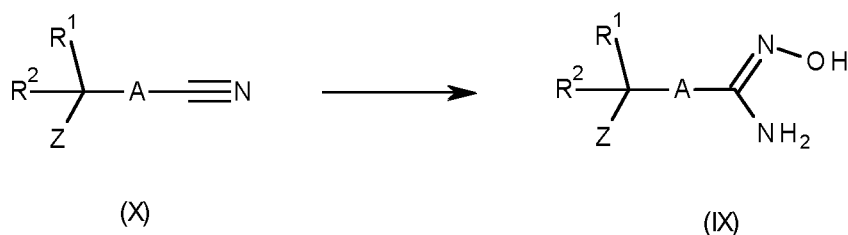
Scheme 6

Alternatively, compounds of Formula (I) can be prepared from compounds of Formula (IX) by treatment with trifluoroacetic anhydride or trifluoroacetyl halide (including trifluoroacetyl fluoride, trifluoroacetyl chloride and trifluoroacetyl bromide) in the presence of a base (e.g., pyridine or 4-dimethylaminopyridine) in a suitable solvent, (e.g., ethyl acetate, tetrahydrofuran, 2-methyl tetrahydrofuran, or ethanol), at a temperature between 0°C and 75°C. For related examples, see WO 2003/028729, WO 2017/118689, and WO 2010/045251. This reaction is shown in Scheme 7.



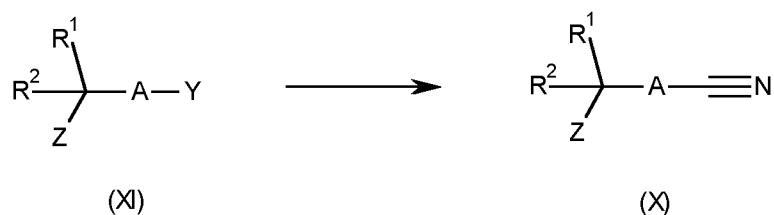
Scheme 7

Compounds of Formula (IX), can be prepared from compounds of Formula (X) by treatment with a hydroxylamine hydrochloride salt or a hydroxylamine solution in water, in the presence of a base, such as triethylamine or K_2CO_3 , in a suitable solvent, such as methanol or ethanol, at a temperature between 0°C and 100°C. In some cases, a better reaction performance may be gained from the use of a catalyst (e.g., 8-hydroxyquinoline). For related examples, see Kitamura, S. *et al Chem. Pharm. Bull.* (2001), 49, 268 and WO 2013/066838. This reaction is shown in Scheme 8.



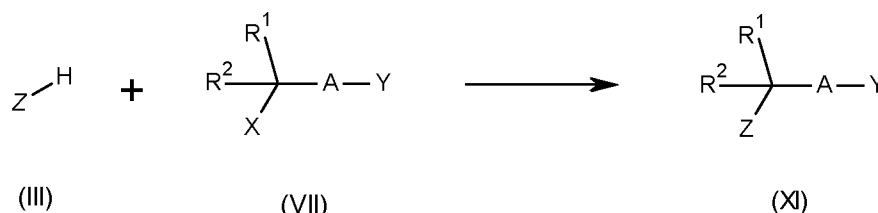
Scheme 8

Compounds of Formula (X), can be prepared from compounds of Formula (XI), wherein Y is Cl, Br or I, via metal-promoted reaction with a suitable cyanide reagent, such as $Pd(0)/Zn(CN)_2$ or $CuCN$, in a suitable solvent (e.g., dimethylformamide or N-methylpyrrolidone) at elevated temperature between 80°C and 120°C. For related examples, see US 2007/0155739, WO 2017/118689, and WO 2009/022746. This reaction is shown in Scheme 9.



Scheme 9

Compounds of Formula (XI), wherein Y is CN, Cl, Br, or I, can be prepared from compounds of Formula (VII), wherein X is OSO₂CH₃, Cl, Br, or I, *via* treatment with compounds of Formula (III), in the presence of a base (e.g., triethylamine, *N,N*-di-isopropylethylamine, K₂CO₃, NaHCO₃, Na₂CO₃, Cs₂CO₃, or NaH) in a suitable solvent (e.g., dimethylacetamide, tetrahydrofuran, 2-methyltetrahydrofuran, acetone, toluene, or acetonitrile) at a temperature between 25°C and 110°C. In some cases, a better reaction performance may be gained from the use of a catalyst (e.g., Bu₄NHSO₄, Bu₄NBr, Bu₄NI, NaI, or 4-dimethylaminopyridine) and microwave irradiation. Furthermore, compounds of formula (XI), can optionally be obtained *via* a coupling transformation with compounds of formula (III) and compounds of formula (VII), wherein X is OH, *via* a process that converts the -OH into an improved leaving group, such as a -OSO₂CH₃ group, for example by using methanesulfonyl chloride (ClSO₂Me), prior to treatment with the compounds of formula (III). Compounds of formula (III) are commercially available or prepared using known methods. For related examples, see: WO 2013/132253, WO 2017/118689, and Garcia, M. *et al Org. Biomol. Chem.* (2004), 11, 1633. This reaction is shown in Scheme 10.



Scheme 10

As already indicated, surprisingly, it has now been found that the compounds of Formula (I) of the present invention have, for practical purposes, a very advantageous level of biological activity for protecting plants against diseases that are caused by fungi.

The compounds of Formula (I) can be used in the agricultural sector and related fields of use, e.g., as active ingredients for controlling plant pests or on non-living materials for the control of spoilage microorganisms or organisms potentially harmful to man. The novel compounds are distinguished by excellent activity at low rates of application, by being well tolerated by plants and by being environmentally safe. They have very useful curative, preventive and systemic properties and can be used for protecting numerous cultivated plants. The compounds of Formula (I) can be used to inhibit or destroy the pests that occur on plants or parts of plants (fruit, blossoms, leaves, stems, tubers, roots) of different crops of useful plants, while at the same time protecting also those parts of the plants that grow later, e.g., from phytopathogenic microorganisms.

The present invention further relates to a method for controlling or preventing infestation of plants or plant propagation material and/or harvested food crops susceptible to microbial attack by treating plants or plant propagation material and/or harvested food crops wherein an effective amount a compound of Formula (I) is applied to the plants, to parts thereof or the locus thereof.

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

It may also be possible to use compounds of Formula (I) as dressing agents for the treatment of plant propagation material, e.g., seed, such as fruits, tubers or grains, or plant cuttings, for the protection against fungal infections as well as against phytopathogenic fungi occurring in the soil. The propagation material can be treated with a composition comprising a compound of Formula (I) before planting: seed, for example, can be dressed before being sown. The active compounds of Formula (I) can also be applied to grains (coating), either by impregnating the seeds in a liquid formulation or by coating them with a solid formulation. The composition can also be applied to the planting site when the propagation material is being planted, for example, to the seed furrow during sowing. The invention relates also to such methods of treating plant propagation material and to the plant propagation material so treated.

Furthermore, the compounds of Formula (I) can be used for controlling fungi in related areas, for example in the protection of technical materials, including wood and wood related technical products, in food storage, in hygiene management.

In addition, the invention could be used to protect non-living materials from fungal attack, e.g. lumber, wall boards and paint.

The compounds of Formula (I) are for example, effective against fungi and fungal vectors of disease as well as phytopathogenic bacteria and viruses. These fungi and fungal vectors of disease as well as phytopathogenic bacteria and viruses are for example:

Absidia corymbifera, *Alternaria* spp, *Aphanomyces* spp, *Ascochyta* spp, *Aspergillus* spp. including *A. flavus*, *A. fumigatus*, *A. nidulans*, *A. niger*, *A. terreus*, *Aureobasidium* spp. including *A. pullulans*, *Blastomyces dermatitidis*, *Blumeria graminis*, *Bremia lactucae*, *Botryosphaeria* spp. including *B. dothidea*, *B. obtusa*, *Botrytis* spp. including *B. cinerea*, *Candida* spp. including *C. albicans*, *C. glabrata*, *C. krusei*, *C. lusitaniae*, *C. parapsilosis*, *C. tropicalis*, *Cephalosporium fragrans*, *Ceratocystis* spp, *Cercospora* spp. including *C. arachidicola*, *Cercosporidium personatum*, *Cladosporium* spp, *Claviceps purpurea*, *Coccidioides immitis*, *Cochliobolus* spp, *Colletotrichum* spp. including *C. musae*, *Cryptococcus neoformans*, *Diaporthe* spp, *Didymella* spp, *Drechslera* spp, *Elsinoe* spp, *Epidermophyton* spp, *Erwinia amylovora*, *Erysiphe* spp. including *E. cichoracearum*, *Eutypa lata*, *Fusarium* spp. including *F. culmorum*, *F. graminearum*, *F. langsethiae*, *F. moniliforme*, *F. oxysporum*, *F. proliferatum*, *F. subglutinans*, *F. solani*, *Gaeumannomyces graminis*, *Gibberella fujikuroi*, *Gloeodes pomigena*, *Gloeosporium musarum*, *Glomerella cingulate*, *Guignardia bidwellii*, *Gymnosporangium*

juniperi-virginianae, Helminthosporium spp, Hemileia spp, Histoplasma spp. including H. capsulatum, Laetisaria fuciformis, Leptographium lindbergi, Leveillula taurica, Lophodermium seditiosum, Microdochium nivale, Microsporum spp, Monilinia spp, Mucor spp, Mycosphaerella spp. including M. graminicola, M. pomi, Oncobasidium theobromaeon, Ophiostoma piceae, Paracoccidioides spp, 5 Penicillium spp. including P. digitatum, P. italicum, Petriellidium spp, Peronosclerospora spp. Including P. maydis, P. philippinensis and P. sorghi, Peronospora spp, Phaeosphaeria nodorum, Phakopsora pachyrhizi, Phellinus igniarius, Phialophora spp, Phoma spp, Phomopsis viticola, Phytophthora spp. including P. infestans, Plasmopara spp. including P. halstedii, P. viticola, Pleospora spp., Podosphaera spp. including P. leucotricha, Polymyxa graminis, Polymyxa betae, Pseudocercospora 10 herpotrichoides, Pseudomonas spp, Pseudoperonospora spp. including P. cubensis, P. humuli, Pseudopeziza tracheiphila, Puccinia Spp. including P. hordei, P. recondita, P. striiformis, P. tritici, Pyrenopeziza spp, Pyrenophora spp, Pyricularia spp. including P. oryzae, Pythium spp. including P. ultimum, Ramularia spp, Rhizoctonia spp, Rhizomucor pusillus, Rhizopus arrizus, Rhynchosporium spp, Scedosporium spp. including S. apiospermum and S. prolificans, Schizothyrium pomi, Sclerotinia 15 spp, Sclerotium spp, Septoria spp, including S. nodorum, S. tritici, Sphaerotheca macularis, Sphaerotheca fusca (Sphaerotheca fuliginea), Sporothrix spp, Stagonospora nodorum, Stemphylium spp, Stereum hirsutum, Thanatephorus cucumeris, Thielaviopsis basicola, Tilletia spp, Trichoderma spp. including T. harzianum, T. pseudokoningii, T. viride, Trichophyton spp, Typhula spp, Uncinula necator, Urocystis spp, Ustilago spp, Venturia spp. including V. inaequalis, Verticillium spp, and 20 Xanthomonas spp.

The compounds of Formula (I) may be used for example on turf, ornamentals, such as flowers, shrubs, broad-leaved trees or evergreens, for example conifers, as well as for tree injection, pest management and the like.

25 Within the scope of present invention, target crops and/or useful plants to be protected typically comprise perennial and annual crops, such as berry plants for example blackberries, blueberries, cranberries, raspberries and strawberries; cereals for example barley, maize (corn), millet, oats, rice, rye, sorghum tritcale and wheat; fibre plants for example cotton, flax, hemp, jute and sisal; field crops for example sugar and fodder beet, coffee, hops, mustard, oilseed rape (canola), poppy, sugar cane, 30 sunflower, tea and tobacco; fruit trees for example apple, apricot, avocado, banana, cherry, citrus, nectarine, peach, pear and plum; grasses for example Bermuda grass, bluegrass, bentgrass, centipede grass, fescue, ryegrass, St. Augustine grass and Zoysia grass; herbs such as basil, borage, chives, coriander, lavender, lovage, mint, oregano, parsley, rosemary, sage and thyme; legumes for example beans, lentils, peas and soya beans; nuts for example almond, cashew, ground nut, hazelnut, peanut, 35 pecan, pistachio and walnut; palms for example oil palm; ornamentals for example flowers, shrubs and trees; other trees, for example cacao, coconut, olive and rubber; vegetables for example asparagus, aubergine, broccoli, cabbage, carrot, cucumber, garlic, lettuce, marrow, melon, okra, onion, pepper, potato, pumpkin, rhubarb, spinach and tomato; and vines for example grapes.

The term "useful plants" is to be understood as also including useful plants that have been 40 rendered tolerant to herbicides like bromoxynil or classes of herbicides (such as, for example, HPPD

inhibitors, ALS inhibitors, for example primisulfuron, prosulfuron and trifloxysulfuron, EPSPS (5-enol-pyrovyl-shikimate-3-phosphate-synthase) inhibitors, GS (glutamine synthetase) inhibitors or PPO (protoporphyrinogen-oxidase) inhibitors) as a result of conventional methods of breeding or genetic engineering. An example of a crop that has been rendered tolerant to imidazolinones, e.g. imazamox, by conventional methods of breeding (mutagenesis) is Clearfield® summer rape (Canola). Examples of crops that have been rendered tolerant to herbicides or classes of herbicides by genetic engineering methods include glyphosate- and glufosinate-resistant maize varieties commercially available under the trade names RoundupReady®, Herculex I® and LibertyLink®.

The term "useful plants" is to be understood as also including useful plants which have been so transformed by the use of recombinant DNA techniques that they are capable of synthesising one or more selectively acting toxins, such as are known, for example, from toxin-producing bacteria, especially those of the genus *Bacillus*.

Examples of such plants are: YieldGard® (maize variety that expresses a CryIA(b) toxin); YieldGard Rootworm® (maize variety that expresses a CryIIIB(b1) toxin); YieldGard Plus® (maize variety that expresses a CryIA(b) and a CryIIIB(b1) toxin); Starlink® (maize variety that expresses a Cry9(c) toxin); Herculex I® (maize variety that expresses a CryIF(a2) toxin and the enzyme phosphinothricine N-acetyltransferase (PAT) to achieve tolerance to the herbicide glufosinate ammonium); NuCOTN 33B® (cotton variety that expresses a CryIA(c) toxin); Bollgard I® (cotton variety that expresses a CryIA(c) toxin); Bollgard II® (cotton variety that expresses a CryIA(c) and a CryIIA(b) toxin); VIPCOT® (cotton variety that expresses a VIP toxin); NewLeaf® (potato variety that expresses a CryIIIA toxin); NatureGard® Agrisure® GT Advantage (GA21 glyphosate-tolerant trait), Agrisure® CB Advantage (Bt11 corn borer (CB) trait), Agrisure® RW (corn rootworm trait) and Protecta®.

The term "crops" is to be understood as including also crop plants which have been so transformed by the use of recombinant DNA techniques that they are capable of synthesising one or more selectively acting toxins, such as are known, for example, from toxin-producing bacteria, especially those of the genus *Bacillus*.

Toxins that can be expressed by such transgenic plants include, for example, insecticidal proteins from *Bacillus cereus* or *Bacillus popilliae*; or insecticidal proteins from *Bacillus thuringiensis*, such as δ -endotoxins, e.g. Cry1Ab, Cry1Ac, Cry1F, Cry1Fa2, Cry2Ab, Cry3A, Cry3Bb1 or Cry9C, or vegetative insecticidal proteins (Vip), e.g. Vip1, Vip2, Vip3 or Vip3A; or insecticidal proteins of bacteria colonising nematodes, for example *Photorhabdus* spp. or *Xenorhabdus* spp., such as *Photorhabdus luminescens*, *Xenorhabdus nematophilus*; toxins produced by animals, such as scorpion toxins, arachnid toxins, wasp toxins and other insect-specific neurotoxins; toxins produced by fungi, such as *Streptomyces* toxins, plant lectins, such as pea lectins, barley lectins or snowdrop lectins; agglutinins; proteinase inhibitors, such as trypsin inhibitors, serine protease inhibitors, patatin, cystatin, papain inhibitors; ribosome-inactivating proteins (RIP), such as ricin, maize-RIP, abrin, luffin, saporin or bryodin; steroid metabolism enzymes, such as 3-hydroxysteroidoxidase, ecdysteroid-UDP-glycosyl-transferase, cholesterol oxidases, ecdysone inhibitors, HMG-COA-reductase, ion channel blockers,

such as blockers of sodium or calcium channels, juvenile hormone esterase, diuretic hormone receptors, stilbene synthase, bibenzyl synthase, chitinases and glucanases.

Further, in the context of the present invention there are to be understood by δ -endotoxins, for example Cry1Ab, Cry1Ac, Cry1F, Cry1Fa2, Cry2Ab, Cry3A, Cry3Bb1 or Cry9C, or vegetative insecticidal proteins (Vip), for example Vip1, Vip2, Vip3 or Vip3A, expressly also hybrid toxins, truncated toxins and modified toxins. Hybrid toxins are produced recombinantly by a new combination of different domains of those proteins (see, for example, WO 02/15701). Truncated toxins, for example a truncated Cry1Ab, are known. In the case of modified toxins, one or more amino acids of the naturally occurring toxin are replaced. In such amino acid replacements, preferably non-naturally present protease recognition sequences are inserted into the toxin, such as, for example, in the case of Cry3A055, a cathepsin-G-recognition sequence is inserted into a Cry3A toxin (see WO 03/018810).

Examples of such toxins or transgenic plants capable of synthesising such toxins are disclosed, for example, in EP-A-0 374 753, WO93/07278, WO95/34656, EP-A-0 427 529, EP-A-451 878 and WO 03/052073.

The processes for the preparation of such transgenic plants are generally known to the person skilled in the art and are described, for example, in the publications mentioned above. CryI-type deoxyribonucleic acids and their preparation are known, for example, from WO 95/34656, EP-A-0 367 474, EP-A-0 401 979 and WO 90/13651.

The toxin contained in the transgenic plants imparts to the plants tolerance to harmful insects. Such insects can occur in any taxonomic group of insects, but are especially commonly found in the beetles (Coleoptera), two-winged insects (Diptera) and butterflies (Lepidoptera).

Transgenic plants containing one or more genes that code for an insecticidal resistance and express one or more toxins are known and some of them are commercially available. Examples of such plants are: YieldGard® (maize variety that expresses a Cry1Ab toxin); YieldGard Rootworm® (maize variety that expresses a Cry3Bb1 toxin); YieldGard Plus® (maize variety that expresses a Cry1Ab and a Cry3Bb1 toxin); Starlink® (maize variety that expresses a Cry9C toxin); Herculex I® (maize variety that expresses a Cry1Fa2 toxin and the enzyme phosphinothricine N-acetyltransferase (PAT) to achieve tolerance to the herbicide glufosinate ammonium); NuCOTN 33B® (cotton variety that expresses a Cry1Ac toxin); Bollgard I® (cotton variety that expresses a Cry1Ac toxin); Bollgard II® (cotton variety that expresses a Cry1Ac and a Cry2Ab toxin); VipCot® (cotton variety that expresses a Vip3A and a Cry1Ab toxin); NewLeaf® (potato variety that expresses a Cry3A toxin); NatureGard®, Agrisure® GT Advantage (GA21 glyphosate-tolerant trait), Agrisure® CB Advantage (Bt11 corn borer (CB) trait) and Protecta®.

Further examples of such transgenic crops are:

1. **Bt11 Maize** from Syngenta Seeds SAS, Chemin de l'Hobit 27, F-31 790 St. Sauveur, France, registration number C/FR/96/05/10. Genetically modified *Zea mays* which has been rendered resistant

to attack by the European corn borer (*Ostrinia nubilalis* and *Sesamia nonagrioides*) by transgenic expression of a truncated Cry1Ab toxin. Bt11 maize also transgenically expresses the enzyme PAT to achieve tolerance to the herbicide glufosinate ammonium.

- 5 2. **Bt176 Maize** from Syngenta Seeds SAS, Chemin de l'Hobit 27, F-31 790 St. Sauveur, France, registration number C/FR/96/05/10. Genetically modified *Zea mays* which has been rendered resistant to attack by the European corn borer (*Ostrinia nubilalis* and *Sesamia nonagrioides*) by transgenic expression of a Cry1Ab toxin. Bt176 maize also transgenically expresses the enzyme PAT to achieve tolerance to the herbicide glufosinate ammonium.

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3. **MIR604 Maize** from Syngenta Seeds SAS, Chemin de l'Hobit 27, F-31 790 St. Sauveur, France, registration number C/FR/96/05/10. Maize which has been rendered insect-resistant by transgenic expression of a modified Cry3A toxin. This toxin is Cry3A055 modified by insertion of a cathepsin-G-protease recognition sequence. The preparation of such transgenic maize plants is described in WO
15 03/018810.

4. **MON 863 Maize** from Monsanto Europe S.A. 270-272 Avenue de Tervuren, B-1150 Brussels, Belgium, registration number C/DE/02/9. MON 863 expresses a Cry3Bb1 toxin and has resistance to certain Coleoptera insects.

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5. **IPC 531 Cotton** from Monsanto Europe S.A. 270-272 Avenue de Tervuren, B-1150 Brussels, Belgium, registration number C/ES/96/02.

6. **1507 Maize** from Pioneer Overseas Corporation, Avenue Tedesco, 7 B-1160 Brussels, Belgium, registration number C/NL/00/10. Genetically modified maize for the expression of the protein Cry1F for achieving resistance to certain Lepidoptera insects and of the PAT protein for achieving tolerance to the herbicide glufosinate ammonium.

7. **NK603 × MON 810 Maize** from Monsanto Europe S.A. 270-272 Avenue de Tervuren, B-1150
30 Brussels, Belgium, registration number C/GB/02/M3/03. Consists of conventionally bred hybrid maize varieties by crossing the genetically modified varieties NK603 and MON 810. NK603 × MON 810 Maize transgenically expresses the protein CP4 EPSPS, obtained from *Agrobacterium sp.* strain CP4, which imparts tolerance to the herbicide Roundup® (contains glyphosate), and also a Cry1Ab toxin obtained from *Bacillus thuringiensis subsp. kurstaki* which brings about tolerance to certain Lepidoptera, include
35 the European corn borer.

The compounds of Formula (I) (including any one of compounds 1.1 to 1.190) according to the present invention comprising a compound of Formula (I) may be used in controlling or preventing phytopathogenic diseases, especially phytopathogenic fungi (such as *Phakopsora pachyrhizi*) on soy
40 bean plants.

In particular, transgenic soybean plants expressing toxins, for example insecticidal proteins such as delta-endotoxins, e.g. Cry1Ac (Cry1Ac Bt protein). Accordingly, this may include transgenic soybean plants comprising event MON87701 (see U.S. Patent No. 8,049,071 and related applications and patents, as well as WO 2014/170327 A1 (eg, see paragraph [008] reference to Intacta RR2 PRO™ soybean)), event MON87751 (US. Patent Application Publication No. 2014/0373191) or event DAS-81419 (U.S. Patent No. 8632978 and related applications and patents).

Other transgenic soybean plants may comprise event SYHT0H2 - HPPD tolerance (U.S. Patent Application Publication No. 2014/0201860 and related applications and patents), event MON89788 - glyphosate tolerance (U.S. Pat. No. 7,632,985 and related applications and patents), event MON87708 - dicamba tolerance (U.S. Patent Application Publication No. US 2011/0067134 and related applications and patents), event DP-356043-5 - glyphosate and ALS tolerance (U.S. Patent Application Publication No. US 2010/0184079 and related applications and patents), event A2704-12 - glufosinate tolerance (U.S. Patent Application Publication No. US 2008/0320616 and related applications and patents), event DP-305423-1 - ALS tolerance (U.S. Patent Application Publication No. US 2008/0312082 and related applications and patents), event A5547-127 - glufosinate tolerance (U.S. Patent Application Publication No. US 2008/0196127 and related applications and patents), event DAS-40278-9 - tolerance to 2,4-dichlorophenoxyacetic acid and aryloxyphenoxypropionate (see WO 2011/022469, WO 2011/022470, WO 2011/022471, and related applications and patents), event 127 - ALS tolerance (WO 2010/080829 and related applications and patents), event GTS 40-3-2 - glyphosate tolerance, event DAS-68416-4-2,4-dichlorophenoxyacetic acid and glufosinate tolerance, event FG72 - glyphosate and isoxaflutole tolerance, event BPS-CV127-9 - ALS tolerance and GU262 - glufosinate tolerance or event SYHT04R - HPPD tolerance.

Under certain circumstances, compounds of Formula (I) according to the present invention when used in controlling or preventing phytopathogenic diseases, especially phytopathogenic fungi (such as *Phakopsora pachyrhizi*) on soy bean plants (in particular any of the transgenic soybean plants as described above), may display a synergistic interaction between the active ingredients.

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

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

The term "plant propagation material" is understood to denote generative parts of the plant, such as seeds, which can be used for the multiplication of the latter, and vegetative material, such as cuttings or tubers, for example potatoes. There can be mentioned for example seeds (in the strict sense), roots, fruits, tubers, bulbs, rhizomes and parts of plants. Germinated plants and young plants which are to be transplanted after germination or after emergence from the soil, may also be mentioned. These young plants can be protected before transplantation by a total or partial treatment by immersion. Preferably "plant propagation material" is understood to denote seeds.

The compounds of Formula (I) may be used in unmodified form or, preferably, together with the adjuvants conventionally employed in the art of formulation. To this end they may be conveniently Formulated in known manner to emulsifiable concentrates, coatable pastes, directly sprayable or dilutable solutions or suspensions, dilute emulsions, wettable powders, soluble powders, dusts, granulates, and also encapsulations e.g. in polymeric substances. As with the type of the compositions, the methods of application, such as spraying, atomising, dusting, scattering, coating or pouring, are chosen in accordance with the intended objectives and the prevailing circumstances. The compositions may also contain further adjuvants such as stabilizers, antifoams, viscosity regulators, binders or tackifiers as well as fertilizers, micronutrient donors or other formulations for obtaining special effects.

Suitable carriers and adjuvants, e.g. for agricultural use, can be solid or liquid and are substances useful in formulation technology, e.g. natural or regenerated mineral substances, solvents, dispersants, wetting agents, tackifiers, thickeners, binders or fertilizers. Such carriers are for example described in WO 97/33890.

Suspension concentrates are aqueous formulations in which finely divided solid particles of the active compound are suspended. Such formulations include anti-settling agents and dispersing agents and may further include a wetting agent to enhance activity as well an anti-foam and a crystal growth inhibitor. In use, these concentrates are diluted in water and normally applied as a spray to the area to be treated. The amount of active ingredient may range from 0.5% to 95% of the concentrate.

Wettable powders are in the form of finely divided particles which disperse readily in water or other liquid carriers. The particles contain the active ingredient retained in a solid matrix. Typical solid matrices include fuller's earth, kaolin clays, silicas and other readily wet organic or inorganic solids. Wettable powders normally contain from 5% to 95% of the active ingredient plus a small amount of wetting, dispersing or emulsifying agent.

Emulsifiable concentrates are homogeneous liquid compositions dispersible in water or other liquid and may consist entirely of the active compound with a liquid or solid emulsifying agent, or may also contain a liquid carrier, such as xylene, heavy aromatic naphthas, isophorone and other non-volatile organic solvents. In use, these concentrates are dispersed in water or other liquid and normally applied as a spray to the area to be treated. The amount of active ingredient may range from 0.5% to 95% of the concentrate.

Granular formulations include both extrudates and relatively coarse particles and are usually applied without dilution to the area in which treatment is required. Typical carriers for granular Formulations include sand, fuller's earth, attapulgite clay, bentonite clays, montmorillonite clay, vermiculite, perlite, calcium carbonate, brick, pumice, pyrophyllite, kaolin, dolomite, plaster, wood flour, ground corn cobs, ground peanut hulls, sugars, sodium chloride, sodium sulphate, sodium silicate, sodium borate, magnesia, mica, iron oxide, zinc oxide, titanium oxide, antimony oxide, cryolite, gypsum, diatomaceous earth, calcium sulphate and other organic or inorganic materials which absorb or which can be coated with the active compound. Granular Formulations normally contain 5% to 25% of active ingredients which may include surface-active agents such as heavy aromatic naphthas, kerosene and other petroleum fractions, or vegetable oils; and/or stickers such as dextrans, glue or synthetic resins.

Dusts are free-flowing admixtures of the active ingredient with finely divided solids such as talc, clays, flours and other organic and inorganic solids which act as dispersants and carriers.

Microcapsules are typically droplets or granules of the active ingredient enclosed in an inert porous shell which allows escape of the enclosed material to the surroundings at controlled rates.

5 Encapsulated droplets are typically 1 to 50 microns in diameter. The enclosed liquid typically constitutes 50 to 95% of the weight of the capsule and may include solvent in addition to the active compound. Encapsulated granules are generally porous granules with porous membranes sealing the granule pore openings, retaining the active species in liquid form inside the granule pores. Granules typically range from 1 millimetre to 1 centimetre and preferably 1 to 2 millimetres in diameter. Granules are formed by
10 extrusion, agglomeration or prilling, or are naturally occurring. Examples of such materials are vermiculite, sintered clay, kaolin, attapulgite clay, sawdust and granular carbon. Shell or membrane materials include natural and synthetic rubbers, cellulosic materials, styrene-butadiene copolymers, polyacrylonitriles, polyacrylates, polyesters, polyamides, polyureas, polyurethanes and starch xanthates.

15 Other useful formulations for agrochemical applications include simple solutions of the active ingredient in a solvent in which it is completely soluble at the desired concentration, such as acetone, alkylated naphthalenes, xylene and other organic solvents. Pressurised sprayers, wherein the active ingredient is dispersed in finely-divided form as a result of vaporisation of a low boiling dispersant solvent carrier, may also be used.

20 Suitable agricultural adjuvants and carriers that are useful in formulating the compositions of the invention in the formulation types described above are well known to those skilled in the art.

Liquid carriers that can be employed include, for example, water, toluene, xylene, petroleum naphtha, crop oil, acetone, methyl ethyl ketone, cyclohexanone, acetic anhydride, acetonitrile, acetophenone, amyl acetate, 2-butanone, chlorobenzene, cyclohexane, cyclohexanol, alkyl acetates,
25 diacetonalcohol, 1,2-dichloropropane, diethanolamine, p-diethylbenzene, diethylene glycol, diethylene glycol abietate, diethylene glycol butyl ether, diethylene glycol ethyl ether, diethylene glycol methyl ether, N,N-dimethyl formamide, dimethyl sulfoxide, 1,4-dioxane, dipropylene glycol, dipropylene glycol methyl ether, dipropylene glycol dibenzoate, diproxitol, alkyl pyrrolidinone, ethyl acetate, 2-ethyl hexanol, ethylene carbonate, 1,1,1-trichloroethane, 2-heptanone, alpha pinene, d-limonene, ethylene glycol, ethylene glycol butyl ether, ethylene glycol methyl ether, gamma-butyrolactone, glycerol, glycerol diacetate, glycerol monoacetate, glycerol triacetate, hexadecane, hexylene glycol, isoamyl acetate, isobornyl acetate, isooctane, isophorone, isopropyl benzene, isopropyl myristate, lactic acid, laurylamine, mesityl oxide, methoxy-propanol, methyl isoamyl ketone, methyl isobutyl ketone, methyl laurate, methyl octanoate, methyl oleate, methylene chloride, m-xylene, n-hexane, n-octylamine,
30 octadecanoic acid, octyl amine acetate, oleic acid, oleylamine, o-xylene, phenol, polyethylene glycol (PEG400), propionic acid, propylene glycol, propylene glycol monomethyl ether, p-xylene, toluene, triethyl phosphate, triethylene glycol, xylene sulfonic acid, paraffin, mineral oil, trichloroethylene, perchloroethylene, ethyl acetate, amyl acetate, butyl acetate, methanol, ethanol, isopropanol, and higher molecular weight alcohols such as amyl alcohol, tetrahydrofurfuryl alcohol, hexanol, octanol,

etc., ethylene glycol, propylene glycol, glycerine and N-methyl-2-pyrrolidinone. Water is generally the carrier of choice for the dilution of concentrates.

Suitable solid carriers include, for example, talc, titanium dioxide, pyrophyllite clay, silica, attapulgite clay, kieselguhr, chalk, diatomaceous earth, lime, calcium carbonate, bentonite clay, fuller's earth, cotton seed hulls, wheat flour, soybean flour, pumice, wood flour, walnut shell flour and lignin.

A broad range of surface-active agents are advantageously employed in both said liquid and solid compositions, especially those designed to be diluted with carrier before application. These agents, when used, normally comprise from 0.1% to 15% by weight of the formulation. They can be anionic, cationic, non-ionic or polymeric in character and can be employed as emulsifying agents, wetting agents, suspending agents or for other purposes. Typical surface active agents include salts of alkyl sulfates, such as diethanolammonium lauryl sulphate; alkylarylsulfonate salts, such as calcium dodecylbenzenesulfonate; alkylphenol-alkylene oxide addition products, such as nonylphenol-C.sub. 18 ethoxylate; alcohol-alkylene oxide addition products, such as tridecyl alcohol-C.sub. 16 ethoxylate; soaps, such as sodium stearate; alkyl naphthalenesulfonate salts, such as sodium dibutyl naphthalenesulfonate; dialkyl esters of sulfosuccinate salts, such as sodium di(2-ethylhexyl) sulfosuccinate; sorbitol esters, such as sorbitol oleate; quaternary amines, such as lauryl trimethylammonium chloride; polyethylene glycol esters of fatty acids, such as polyethylene glycol stearate; block copolymers of ethylene oxide and propylene oxide; and salts of mono and dialkyl phosphate esters.

Other adjuvants commonly utilized in agricultural compositions include crystallisation inhibitors, viscosity modifiers, suspending agents, spray droplet modifiers, pigments, antioxidants, foaming agents, anti-foaming agents, light-blocking agents, compatibilizing agents, antifoam agents, sequestering agents, neutralising agents and buffers, corrosion inhibitors, dyes, odorants, spreading agents, penetration aids, micronutrients, emollients, lubricants and sticking agents.

In addition, further, other biocidally active ingredients or compositions may be combined with the compositions of the invention and used in the methods of the invention and applied simultaneously or sequentially with the compositions of the invention. When applied simultaneously, these further active ingredients may be formulated together with the compositions of the invention or mixed in, for example, the spray tank. These further biocidally active ingredients may be fungicides, herbicides, insecticides, bactericides, acaricides, nematocides and/or plant growth regulators.

Pesticidal agents are referred to herein using their common name are known, for example, from "The Pesticide Manual", 15th Ed., British Crop Protection Council 2009.

In addition, the compositions of the invention may also be applied with one or more systemically acquired resistance inducers ("SAR" inducer). SAR inducers are known and described in, for example, United States Patent No. US 6,919,298 and include, for example, salicylates and the commercial SAR inducer acibenzolar-S-methyl.

The compounds of Formula (I) are normally used in the form of agrochemical compositions and can be applied to the crop area or plant to be treated, simultaneously or in succession with further compounds. These further compounds can be e.g. fertilizers or micronutrient donors or other

preparations, which influence the growth of plants. They can also be selective herbicides or non-selective herbicides as well as insecticides, fungicides, bactericides, nematocides, molluscicides or mixtures of several of these preparations, if desired together with further carriers, surfactants or application promoting adjuvants customarily employed in the art of formulation.

5 The compounds of Formula (I) may be used in the form of (fungicidal) compositions for controlling or protecting against phytopathogenic microorganisms, comprising as active ingredient at least one compound of Formula (I) or of at least one preferred individual compound as defined herein, in free form or in agrochemically usable salt form, and at least one of the above-mentioned adjuvants.

10 The invention therefore provides a composition, preferably a fungicidal composition, comprising at least one compound Formula (I) an agriculturally acceptable carrier and optionally an adjuvant. An agricultural acceptable carrier is for example a carrier that is suitable for agricultural use. Agricultural carriers are well known in the art. Preferably said composition may comprise at least one or more pesticidally-active compounds, for example an additional fungicidal active ingredient in addition to the compound of Formula (I).

15 The compound of Formula (I) may be the sole active ingredient of a composition or it may be admixed with one or more additional active ingredients such as a pesticide, fungicide, synergist, herbicide or plant growth regulator where appropriate. An additional active ingredient may, in some cases, result in unexpected synergistic activities.

20 Examples of suitable additional active ingredients include the following: acycloamino acid fungicides, aliphatic nitrogen fungicides, amide fungicides, anilide fungicides, antibiotic fungicides, aromatic fungicides, arsenical fungicides, aryl phenyl ketone fungicides, benzamide fungicides, benzanilide fungicides, benzimidazole fungicides, benzothiazole fungicides, botanical fungicides, bridged diphenyl fungicides, carbamate fungicides, carbanilate fungicides, conazole fungicides, copper
25 fungicides, dicarboximide fungicides, dinitrophenol fungicides, dithiocarbamate fungicides, dithiolane fungicides, furamide fungicides, furanilide fungicides, hydrazide fungicides, imidazole fungicides, mercury fungicides, morpholine fungicides, organophosphorous fungicides, organotin fungicides, oxathiin fungicides, oxazole fungicides, phenylsulfamide fungicides, polysulfide fungicides, pyrazole fungicides, pyridine fungicides, pyrimidine fungicides, pyrrole fungicides, quaternary ammonium
30 fungicides, quinoline fungicides, quinone fungicides, quinoxaline fungicides, strobilurin fungicides, sulfonanilide fungicides, thiadiazole fungicides, thiazole fungicides, thiazolidine fungicides, thiocarbamate fungicides, thiophene fungicides, triazine fungicides, triazole fungicides, triazolopyrimidine fungicides, urea fungicides, valinamide fungicides, and zinc fungicides.

35 Examples of suitable additional active ingredients also include the following: 3-difluoromethyl-1-methyl-1H-pyrazole-4-carboxylic acid (9-dichloromethylene-1,2,3,4-tetrahydro-1,4-methanonaphthalen-5-yl)-amide, 3-difluoromethyl-1-methyl-1H-pyrazole-4-carboxylic acid methoxy-[1-methyl-2-(2,4,6-trichlorophenyl)-ethyl]-amide, 1-methyl-3-difluoromethyl-1H-pyrazole-4-carboxylic acid (2-dichloromethylene-3-ethyl-1-methyl-indan-4-yl)-amide (1072957-71-1), 1-methyl-3-difluoromethyl-1H-pyrazole-4-carboxylic acid (4'-methylsulfanyl-biphenyl-2-yl)-amide, 1-methyl-3-difluoromethyl-4H-pyrazole-4-carboxylic acid [2-(2,4-dichlorophenyl)-2-methoxy-1-methyl-ethyl]-amide, (5-Chloro-2,4-

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dimethyl-pyridin-3-yl)-(2,3,4-trimethoxy-6-methyl-phenyl)-methanone, (5-Bromo-4-chloro-2-methoxy-pyridin-3-yl)-(2,3,4-trimethoxy-6-methyl-phenyl)-methanone, 2-{2-[(E)-3-(2,6-Dichloro-phenyl)-1-methyl-prop-2-en-(E)-ylideneaminooxymethyl]-phenyl}-2-[(Z)-methoxyimino]-N-methyl-acetamide, 3-[5-(4-Chloro-phenyl)-2,3-dimethyl-isoxazolidin-3-yl]-pyridine, (E)-N-methyl-2-[2-(2,5-dimethylphenoxy)methyl]phenyl]-2-methoxy-iminoacetamide, 4-bromo-2-cyano-N,N-dimethyl-6-trifluoromethylbenzimidazole-1-sulphonamide, a-[N-(3-chloro-2,6-xylyl)-2-methoxyacetamido]-γ-butyrolactone, 4-chloro-2-cyano-N,N-dimethyl-5-p-tolylimidazole-1-sulfonamide, N-allyl-4,5-dimethyl-2-trimethylsilylthiophene-3-carboxamide, N-(1-cyano-1,2-dimethylpropyl)-2-(2,4-dichlorophenoxy)propionamide, N-(2-methoxy-5-pyridyl)-cyclopropane carboxamide, (+,-)-cis-1-(4-chlorophenyl)-2-(1H-1,2,4-triazol-1-yl)-cycloheptanol, 2-(1-*tert*-butyl)-1-(2-chlorophenyl)-3-(1,2,4-triazol-1-yl)-propan-2-ol, 2',6'-dibromo-2-methyl-4-trifluoromethoxy-4'-trifluoromethyl-1,3-thiazole-5-carboxanilide, 1-imidazolyl-1-(4'-chlorophenoxy)-3,3-dimethylbutan-2-one, methyl (E)-2-[2-[6-(2-cyanophenoxy)pyrimidin-4-yloxy]phenyl]-3-methoxyacrylate, methyl (E)-2-[2-[6-(2-thioamidophenoxy)pyrimidin-4-yloxy]phenyl]-3-methoxyacrylate, methyl (E)-2-[2-[6-(2-fluorophenoxy)pyrimidin-4-yloxy]phenyl]-3-methoxyacrylate, methyl (E)-2-[2-[6-(2,6-difluorophenoxy)pyrimidin-4-yloxy]phenyl]-3-methoxyacrylate, methyl (E)-2-[2-[3-(pyrimidin-2-yloxy)phenoxy]phenyl]-3-methoxyacrylate, methyl (E)-2-[2-[3-(5-methylpyrimidin-2-yloxy)-phenoxy]phenyl]-3-methoxyacrylate, methyl (E)-2-[2-[3-(phenyl-sulphonyloxy)phenoxy]phenyl]-3-methoxyacrylate, methyl (E)-2-[2-[3-(4-nitrophenoxy)phenoxy]phenyl]-3-methoxyacrylate, methyl (E)-2-[2-phenoxyphenyl]-3-methoxyacrylate, methyl (E)-2-[2-(3,5-dimethyl-benzoyl)pyrrol-1-yl]-3-methoxyacrylate, methyl (E)-2-[2-(3-methoxyphenoxy)phenyl]-3-methoxyacrylate, methyl (E)-2-[2-(2-phenylethen-1-yl)-phenyl]-3-methoxyacrylate, methyl (E)-2-[2-(3,5-dichlorophenoxy)pyridin-3-yl]-3-methoxyacrylate, methyl (E)-2-(2-(3-(1,1,2,2-tetrafluoroethoxy)phenoxy)phenyl)-3-methoxyacrylate, methyl (E)-2-(2-[3-(α-hydroxybenzyl)phenoxy]phenyl)-3-methoxyacrylate, methyl (E)-2-(2-(4-phenoxy)pyridin-2-yloxy)phenyl)-3-methoxyacrylate, methyl (E)-2-[2-(3-*n*-propyloxy-phenoxy)phenyl]-3-methoxyacrylate, methyl (E)-2-[2-(3-isopropyloxyphenoxy)phenyl]-3-methoxyacrylate, methyl (E)-2-[2-[3-(2-fluorophenoxy)phenoxy]phenyl]-3-methoxyacrylate, methyl (E)-2-[2-(3-ethoxyphenoxy)phenyl]-3-methoxyacrylate, methyl (E)-2-[2-(4-*tert*-butyl-pyridin-2-yloxy)phenyl]-3-methoxyacrylate, methyl (E)-2-[2-[3-(3-cyanophenoxy)phenoxy]phenyl]-3-methoxyacrylate, methyl (E)-2-[2-[(3-methyl-pyridin-2-yloxymethyl)phenyl]-3-methoxyacrylate, methyl (E)-2-[2-[6-(2-methyl-phenoxy)pyrimidin-4-yloxy]phenyl]-3-methoxyacrylate, methyl (E)-2-[2-(5-bromo-pyridin-2-yloxymethyl)phenyl]-3-methoxyacrylate, methyl (E)-2-[2-(3-(3-iodopyridin-2-yloxy)phenoxy)phenyl]-3-methoxyacrylate, methyl (E)-2-[2-[6-(2-chloropyridin-3-yloxy)pyrimidin-4-yloxy]phenyl]-3-methoxyacrylate, methyl (E),(E)-2-[2-(5,6-dimethylpyrazin-2-yl)methyloximinomethyl]phenyl]-3-methoxyacrylate, methyl (E)-2-[2-[6-(6-methylpyridin-2-yloxy)pyrimidin-4-yloxy]phenyl]-3-methoxyacrylate, methyl (E),(E)-2-[2-(3-methoxyphenyl)methyloximinomethyl]-phenyl]-3-methoxyacrylate, methyl (E)-2-[2-(6-(2-azidophenoxy)-pyrimidin-4-yloxy]phenyl]-3-methoxyacrylate, methyl (E),(E)-2-[2-[6-phenylpyrimidin-4-yl)-methyloximinomethyl]phenyl]-3-methoxyacrylate, methyl (E),(E)-2-[2-[(4-chlorophenyl)-methyloximinomethyl]-phenyl]-3-methoxyacrylate, methyl (E)-2-[2-[6-(2-*n*-propylphenoxy)-1,3,5-triazin-4-yloxy]phenyl]-3-methoxyacrylate, methyl (E),(E)-2-[2-[3-

nitrophenyl)methyloximinomethyl]phenyl}-3-methoxyacrylate, 3-chloro-7-(2-aza-2,7,7-trimethyl-oct-3-en-5-ine), 2,6-dichloro-N-(4-trifluoromethylbenzyl)-benzamide, 3-iodo-2-propinyl alcohol, 4-chlorophenyl-3-iodopropargyl formal, 3-bromo-2,3-diiodo-2-propenyl ethylcarbamate, 2,3,3-triiodoallyl alcohol, 3-bromo-2,3-diiodo-2-propenyl alcohol, 3-iodo-2-propinyl n-butylcarbamate, 3-iodo-2-propinyl n-hexylcarbamate, 3-iodo-2-propinyl cyclohexyl-carbamate, 3-iodo-2-propinyl phenylcarbamate; phenol derivatives, such as tribromophenol, tetrachlorophenol, 3-methyl-4-chlorophenol, 3,5-dimethyl-4-chlorophenol, phenoxyethanol, dichlorophene, o-phenylphenol, m-phenylphenol, p-phenylphenol, 2-benzyl-4-chlorophenol, 5-hydroxy-2(5H)-furanone; 4,5-dichlorodithiazolinone, 4,5-benzodithiazolinone, 4,5-trimethylenedithiazolinone, 4,5-dichloro-(3H)-1,2-dithiol-3-one, 3,5-dimethyl-tetrahydro-1,3,5-thiadiazine-2-thione, N-(2-p-chlorobenzoyl)ethyl)-hexaminium chloride, acibenzolar, acypetacs, alanycarb, albendazole, aldimorph, allicin, allyl alcohol, ametocradin, amisulbrom, amobam, ampropylfos, anilazine, asomate, aureofungin, azaconazole, azafendin, azithiram, azoxystrobin, barium polysulfide, benalaxyl, benalaxyl-M, benodanil, benomyl, benquinox, bentaluron, benthiavalicarb, benthiazole, benzalkonium chloride, benzamacril, benzamorf, benzohydroxamic acid, benzovindiflupyr, berberine, bethoxazin, biloxazol, binapacryl, biphenyl, bitertanol, bithionol, bixafen, blasticidin-S, boscalid, bromothalonil, bromuconazole, bupirimate, buthiobate, butylamine calcium polysulfide, captafol, captan, carbamorph, carbendazim, carbendazim chlorhydrate, carboxin, carpropamid, carvone, CGA41396, CGA41397, chinomethionate, chitosan, chlobenthiazole, chloraniformethan, chloranil, chlorfenazole, chloroneb, chloropicrin, chlorothalonil, chlorozoline, chlozoline, climbazole, clotrimazole, clozylacon, copper containing compounds such as copper acetate, copper carbonate, copper hydroxide, copper naphthenate, copper oleate, copper oxychloride, copper oxyquinolate, copper silicate, copper sulphate, copper tallate, copper zinc chromate and Bordeaux mixture, cresol, cufraneb, cuprobam, cuprous oxide, cyazofamid, cyclafuramid, cycloheximide, cyflufenamid, cymoxanil, cypendazole, cyproconazole, cyprodinil, dazomet, debacarb, decafentin, dehydroacetic acid, di-2-pyridyl disulphide 1, 1'-dioxide, dichlofluand, diclomezine, dichlone, dicloran, dichlorophen, dichlozoline, diclobutrazol, diclocymet, diethofencarb, difenoconazole, difenzoquat, diflumetorim, O, O-di-iso-propyl-S-benzyl thiophosphate, dimefluzole, dimetachlone, dimetconazole, dimethomorph, dimethirimol, diniconazole, diniconazole-M, dinobuton, dinocap, dinocron, dinopenton, dinosulfon, dinoterbon, diphenylamine, dipyrithione, disulfiram, ditalimfos, dithianon, dithioether, dodecyl dimethyl ammonium chloride, dodemorph, dodicin, dodine, doguadine, drazoxolon, edifenphos, enestroburin, epoxiconazole, etaconazole, etem, ethaboxam, ethirimol, ethoxyquin, ethilicin, ethyl (Z)-N-benzyl-N ([methyl (methyl-thioethylideneamino-oxycarbonyl) amino] thio)- β -alaninate, etridiazole, famoxadone, fenamidone, fenaminosulf, fenapanil, fenarimol, fenbuconazole, fenfuram, fenhexamid, fenitropan, fenoxanil, fenpiclonil, fempicoxamid, fenpropidin, fenpropimorph, fenpyrazamine, fentin acetate, fentin hydroxide, ferbam, ferimzone, fluazinam, fludioxonil, flumetover, flumorph, flupicolide, fluopyram, fluoroimide, fluotrimazole, fluoxastrobil, fluquinconazole, flusilazole, flusulfamide, flutanil, flutolanil, flutriafol, fluxapyroxad, folpet, formaldehyde, fosetyl, fuberidazole, furalaxyl, furametpyr, furcarbanil, furconazole, furfural, furmecyclox, furophanate, glyodin, griseofulvin, guazatine, halacrinat, hexachlorobenzene, hexachlorobutadiene, hexachlorophene, hexaconazole, hexylthiofos, hydrargaphen, hydroxyisoxazole, hymexazole, imazalil, imazalil sulphate, imibenconazole, iminoctadine, iminoctadine

triacetate, inezin, iodocarb, ipconazole, ipfentrifluconazole, iprobenfos, iprodione, iprovalicarb, isopropanyl butyl carbamate, isoprothiolane, isopyrazam, isotianil, isovaledione, izopamfos, kasugamycin, kresoxim-methyl, LY186054, LY211795, LY248908, mancozeb, mandipropamid, maneb, mebenil, mecarbinzid, mefenoxam, mefentrifluconazole, mepanipyrim, mepronil, mercuric chloride, mercurous chloride, meptyldinocap, metalaxyl, metalaxyl-M, metam, metazoxolon, metconazole, methasulfocarb, methfuroxam, methyl bromide, methyl iodide, methyl isothiocyanate, metiram, metiram-zinc, metominostrobin, metrafenone, metsulfovax, milneb, moroxydine, myclobutanil, myclozolin, nabam, natamycin, neoasozin, nickel dimethyldithiocarbamate, nitrostyrene, nitrothal-isopropyl, nuarimol, octhilinone, ofurace, organomercury compounds, orysastrobin, osthol, oxadixyl, oxasulfuron, oxine-copper, oxolinic acid, oxpoconazole, oxycarboxin, parinol, pefurazoate, penconazole, pencycuron, penflufen, pentachlorophenol, penthiopyrad, phenamacril, phenazin oxide, phosdiphen, phosetyl-Al, phosphorus acids, phthalide, picoxystrobin, piperalin, polycarbamate, polyoxin D, polyoxrim, polyram, probenazole, prochloraz, procymidone, propamidine, propamocarb, propiconazole, propineb, propionic acid, proquinazid, prothiocarb, prothioconazole, pydiflumetofen, pyracarbolid, pyraclostrobin, pyrametrostrobin, pyraoxystrobin, pyrazophos, pyribencarb, pyridinitril, pyrifenox, pyrimethanil, pyriofenone, pyroquilon, pyroxychlor, pyroxyfur, pyrrolnitrin, quaternary ammonium compounds, quinacetol, quinazamid, quinconazole, quinomethionate, quinoxyfen, quintozone, rabenzazole, santonin, sedaxane, silthiofam, simeconazole, sipconazole, sodium pentachlorophenate, spiroxamine, streptomycin, sulphur, sultropen, tebuconazole, tebfloquin, tecloftalam, tecnazene, tecoram, tetraconazole, thiabendazole, thiadifluor, thicyofen, thifluzamide, 2-(thiocyanomethylthio) benzothiazole, thiophanate-methyl, thioquinox, thiram, tiadinil, timibenconazole, tioxymid, tolclofos-methyl, tolylfluanid, triadimefon, triadimenol, triamiphos, triarimol, triazbutil, triazoxide, tricyclazole, tridemorph, trifloxystrobin, triflumazole, triforine, triflumizole, triticonazole, uniconazole, urbacide, validamycin, valifenalate, vapam, vinclozolin, zarilamid, zineb, ziram, and zoxamide.

The compounds of the invention may also be used in combination with anthelmintic agents. Such anthelmintic agents include, compounds selected from the macrocyclic lactone class of compounds such as ivermectin, avermectin, abamectin, emamectin, eprinomectin, doramectin, selamectin, moxidectin, nemadectin and milbemycin derivatives as described in EP- 357460, EP- 444964 and EP-594291. Additional anthelmintic agents include semisynthetic and biosynthetic avermectin/milbemycin derivatives such as those described in US-5015630, WO-9415944 and WO-9522552. Additional anthelmintic agents include the benzimidazoles such as albendazole, cambendazole, fenbendazole, flubendazole, mebendazole, oxfendazole, oxibendazole, parbendazole, and other members of the class. Additional anthelmintic agents include imidazothiazoles and tetrahydropyrimidines such as tetramisole, levamisole, pyrantel pamoate, oxantel or morantel. Additional anthelmintic agents include flukicides, such as triclabendazole and clorsulon and the cestocides, such as praziquantel and epsiprantel.

The compounds of the invention may be used in combination with derivatives and analogues of the paraherquamide/marcfortine class of anthelmintic agents, as well as the antiparasitic oxazolines such as those disclosed in US-5478855, US- 4639771 and DE-19520936.

The compounds of the invention may be used in combination with derivatives and analogues of the general class of dioxomorpholine antiparasitic agents as described in WO 96/15121 and also with anthelmintic active cyclic depsipeptides such as those described in WO 96/11945, WO 93/19053, WO 93/25543, EP 0 626 375, EP 0 382 173, WO 94/19334, EP 0 382 173, and EP 0 503 538.

The compounds of the invention may be used in combination with other ectoparasiticides; for example, fipronil; pyrethroids; organophosphates; insect growth regulators such as lufenuron; ecdysone agonists such as tebufenozide and the like; neonicotinoids such as imidacloprid and the like.

The compounds of the invention may be used in combination with terpene alkaloids, for example those described in International Patent Application Publication Numbers WO 95/19363 or WO 04/72086, particularly the compounds disclosed therein.

Other examples of such biologically active compounds that the compounds of the invention may be used in combination with include but are not restricted to the following:

Organophosphates: acephate, azamethiphos, azinphos-ethyl, azinphos- methyl, bromophos, bromophos-ethyl, cadusafos, chlorethoxyphos, chlorpyrifos, chlorfenvinphos, chlormephos, demeton, demeton-S-methyl, demeton-S-methyl sulphone, dialifos, diazinon, dichlorvos, dicrotophos, dimethoate, disulfoton, ethion, ethoprophos, etrimfos, famphur, fenamiphos, fenitrothion, fensulfothion, fenthion, flupyrzofos, fonofos, formothion, fosthiazate, heptenophos, isazophos, isothioate, isoxathion, malathion, methacriphos, methamidophos, methidathion, methyl- parathion, mevinphos, monocrotophos, naled, omethoate, oxydemeton-methyl, paraoxon, parathion, parathion-methyl, phenthoate, phosalone, phosfolan, phosphocarb, phosmet, phosphamidon, phorate, phoxim, pirimiphos, pirimiphos- methyl, profenofos, propaphos, proetamphos, prothiofos, pyraclofos, pyridapenthion, quinalphos, sulprophos, temephos, terbufos, tebupirimfos, tetrachlorvinphos, thimeton, triazophos, trichlorfon, vamidothion.

Carbamates: alanycarb, aldicarb, 2-sec-butylphenyl methylcarbamate, benfuracarb, carbaryl, carbofuran, carbosulfan, cloethocarb, ethiofencarb, fenoxycarb, fenthioncarb, furathiocarb, HCN-801, isoprocarb, indoxacarb, methiocarb, methomyl, 5-methyl-m-cumenylbutyryl(methyl)carbamate, oxamyl, pirimicarb, propoxur, thiodicarb, thiofanox, triazamate, UC-51717.

Pyrethroids: acrinathin, allethrin, alphametrin, 5-benzyl-3-furylmethyl (E)-(1 R)-cis-2,2-dimethyl-3-(2-oxothiolo-3-ylidenemethyl)cyclopropanecarboxylate, bifenthrin, beta-cyfluthrin, cyfluthrin, a-cypermethrin, beta-cypermethrin, bioallethrin, bioallethrin((S)-cyclopentylisomer), bioresmethrin, bifenthrin, NCI-85193, cycloprothrin, cyhalothrin, cythithrin, cyphenothrin, deltamethrin, empenethrin, esfenvalerate, ethofenprox, fenfluthrin, fenpropathrin, fenvalerate, flucythrinate, flumethrin, fluvalinate (D isomer), imiprothrin, cyhalothrin, lambda-cyhalothrin, permethrin, phenothrin, prallethrin, pyrethrins (natural products), resmethrin, tetramethrin, transfluthrin, theta-cypermethrin, silafluofen, t-fluvalinate, tefluthrin, tralomethrin, Zeta-cypermethrin.

Arthropod growth regulators: a) chitin synthesis inhibitors: benzoylureas: chlorfluazuron, diflubenzuron, fluazuron, flucycloxuron, flufenoxuron, hexaflumuron, lufenuron, novaluron,

teflubenzuron, triflumuron, buprofezin, diofenolan, hexythiazox, etoxazole, chlorfentazine; b) ecdysone antagonists: halofenozide, methoxyfenozide, tebufenozide; c) juvenoids: pyriproxyfen, methoprene (including S-methoprene), fenoxycarb; d) lipid biosynthesis inhibitors: spiroadiclofen.

Other antiparasitics: acequinocyl, amitraz, AKD-1022, ANS-118, azadirachtin, *Bacillus thuringiensis*, bensultap, bifenazate, binapacryl, bromopropylate, BTG-504, BTG-505, camphechlor, cartap, chlorobenzilate, chlordimeform, chlorfenapyr, chromafenozide, clothianidine, cyromazine, diaclofen, diafenthiuron, DBI-3204, dinactin, dihydroxymethyl-dihydroxypyrrolidine, dinobuton, dinocap, endosulfan, ethiprole, ethofenprox, fenazaquin, flumite, MTI- 800, fenpyroximate, fluacrypyrim, flubenzimine, flubrocyclothrinate, flufenazine, flufenprox, fluproxyfen, halofenprox, hydramethylnon, IKI-220, kanemite, NC-196, neem guard, nidinortofuran, nitenpyram, SD-35651, WL-108477, piridaryl, propargite, protrifenbute, pymethroline, pyridaben, pyrimidifen, NC-1111, R-195, RH-0345, RH-2485, RYI-210, S-1283, S-1833, SI-8601, silafluofen, silomadine, spinosad, tebufenpyrad, tetradifon, tetranactin, thiacloprid, thiocyclam, thiamethoxam, tolfenpyrad, triazamate, triethoxyspinosyn, trinactin, verbutin, vertalec, YI-5301.

Biological agents: *Bacillus thuringiensis* ssp *aizawai*, *kurstaki*, *Bacillus thuringiensis* delta endotoxin, baculovirus, entomopathogenic bacteria, virus and fungi.

Bactericides: chlortetracycline, oxytetracycline, streptomycin.

Other biological agents: enrofloxacin, febantel, penethamate, moloxicam, cefalexin, kanamycin, pimobendan, clenbuterol, omeprazole, tiamulin, benazepril, pyriprole, cefquinome, florfenicol, buserelin, cefovecin, tulathromycin, ceftiofur, carprofen, metaflumizone, praziquarantel, triclabendazole.

The following mixtures of the compounds of Formula (I) with active ingredients are preferred. The abbreviation "TX" means one compound selected from the group consisting of the compounds as represented in Tables 1.1 to 1.3 and Tables 2.1 and 2.2 (below), or the compounds 1.1 to 1.190 described in Table T1, (below):

an adjuvant selected from the group of substances consisting of petroleum oils (alternative name) (628) + TX,

an acaricide selected from the group of substances consisting of 1,1-bis(4-chlorophenyl)-2-ethoxyethanol (IUPAC name) (910) + TX, 2,4-dichlorophenyl benzenesulfonate (IUPAC/Chemical Abstracts name) (1059) + TX, 2-fluoro-*N*-methyl-*N*-1-naphthylacetamide (IUPAC name) (1295) + TX, 4-chlorophenyl phenyl sulfone (IUPAC name) (981) + TX, abamectin (1) + TX, acequinocyl (3) + TX, acetoprole [CCN] + TX, acrinathrin (9) + TX, aldicarb (16) + TX, aldoxycarb (863) + TX, alpha-cypermethrin (202) + TX, amidithion (870) + TX, amidoflumet [CCN] + TX, amidothioate (872) + TX, amiton (875) + TX, amiton hydrogen oxalate (875) + TX, amitraz (24) + TX, aramite (881) + TX, arsenous oxide (882) + TX, AVI 382 (compound code) + TX, AZ 60541 (compound code) + TX, azinphos-ethyl (44) + TX, azinphos-methyl (45) + TX, azobenzene (IUPAC name) (888) + TX, azocyclotin (46) + TX, azothoate (889) + TX, benomyl (62) + TX, benoxafos (alternative name) [CCN] + TX, benzoximate (71) + TX, benzyl benzoate (IUPAC name) [CCN] + TX, bifenazate (74) + TX, bifenthrin (76) + TX, binapacryl (907) + TX, brofenvalerate (alternative name) + TX, bromocyclen (918) + TX, bromophos (920) + TX, bromophos-ethyl (921) + TX, bromopropylate (94) + TX, buprofezin (99)

+ TX, butocarboxim (103) + TX, butoxycarboxim (104) + TX, butylpyridaben (alternative name) + TX, calcium polysulfide (IUPAC name) (111) + TX, camphechlor (941) + TX, carbanolate (943) + TX, carbaryl (115) + TX, carbofuran (118) + TX, carbophenothion (947) + TX, CGA 50'439 (development code) (125) + TX, chinomethionat (126) + TX, chlorbense (959) + TX, chlordimeform (964) + TX, 5 chlordimeform hydrochloride (964) + TX, chlorfenapyr (130) + TX, chlorfenethol (968) + TX, chlorfenson (970) + TX, chlorfensulfide (971) + TX, chlorfenvinphos (131) + TX, chlorobenzilate (975) + TX, chloromebuform (977) + TX, chloromethiuron (978) + TX, chloropropylate (983) + TX, chlorpyrifos (145) + TX, chlorpyrifos-methyl (146) + TX, chlorthiophos (994) + TX, cinerin I (696) + TX, cinerin II (696) + TX, cinerins (696) + TX, clofentezine (158) + TX, closantel (alternative name) [CCN] + TX, coumaphos 10 (174) + TX, crotamiton (alternative name) [CCN] + TX, crotoxyphos (1010) + TX, cufraneb (1013) + TX, cyanthoate (1020) + TX, cyflumetofen (CAS Reg. No.: 400882-07-7) + TX, cyhalothrin (196) + TX, cyhexatin (199) + TX, cypermethrin (201) + TX, DCPM (1032) + TX, DDT (219) + TX, demephion (1037) + TX, demephion-O (1037) + TX, demephion-S (1037) + TX, demeton (1038) + TX, demeton-methyl (224) + TX, demeton-O (1038) + TX, demeton-O-methyl (224) + TX, demeton-S (1038) + TX, demeton-S-methyl (224) + TX, demeton-S-methylsulfon (1039) + TX, diafenthion (226) + TX, dialifos (1042) + TX, diazinon (227) + TX, dichlofluanid (230) + TX, dichlorvos (236) + TX, dicliphos (alternative name) + TX, dicofol (242) + TX, dicrotophos (243) + TX, dienochlor (1071) + TX, dimefox (1081) + TX, dimethoate (262) + TX, dinactin (alternative name) (653) + TX, dinex (1089) + TX, dinex-diclexine (1089) + TX, dinobuton (269) + TX, dinocap (270) + TX, dinocap-4 [CCN] + TX, dinocap-6 [CCN] + TX, 20 dinocron (1090) + TX, dinopenton (1092) + TX, dinosulfon (1097) + TX, dinoterbon (1098) + TX, dioxathion (1102) + TX, diphenyl sulfone (IUPAC name) (1103) + TX, disulfiram (alternative name) [CCN] + TX, disulfoton (278) + TX, DNOC (282) + TX, dofenapyn (1113) + TX, doramectin (alternative name) [CCN] + TX, endosulfan (294) + TX, endothion (1121) + TX, EPN (297) + TX, eprinomectin (alternative name) [CCN] + TX, ethion (309) + TX, ethoate-methyl (1134) + TX, etoxazole (320) + TX, 25 etrimfos (1142) + TX, fenazaflor (1147) + TX, fenazaquin (328) + TX, fenbutatin oxide (330) + TX, fenothiocarb (337) + TX, fenpropathrin (342) + TX, fenpyrad (alternative name) + TX, fenpyroximate (345) + TX, fenson (1157) + TX, fentrifanil (1161) + TX, fenvalerate (349) + TX, fipronil (354) + TX, fluacrypyrim (360) + TX, fluazuron (1166) + TX, flubenzimine (1167) + TX, flucyclohexuron (366) + TX, flucythrinate (367) + TX, fluenetil (1169) + TX, flufenoxuron (370) + TX, flumethrin (372) + TX, 30 fluorbense (1174) + TX, fluvalinate (1184) + TX, FMC 1137 (development code) (1185) + TX, formetanate (405) + TX, formetanate hydrochloride (405) + TX, formothion (1192) + TX, formparanate (1193) + TX, gamma-HCH (430) + TX, glyodin (1205) + TX, halfenprox (424) + TX, heptenophos (432) + TX, hexadecyl cyclopropanecarboxylate (IUPAC/Chemical Abstracts name) (1216) + TX, hexythiazox (441) + TX, iodomethane (IUPAC name) (542) + TX, isocarbophos (alternative name) (473) + TX, 35 isopropyl O-(methoxyaminothiophosphoryl)salicylate (IUPAC name) (473) + TX, ivermectin (alternative name) [CCN] + TX, jasmolin I (696) + TX, jasmolin II (696) + TX, jodfenphos (1248) + TX, lindane (430) + TX, lufenuron (490) + TX, malathion (492) + TX, malonoben (1254) + TX, mecarbam (502) + TX, mephosfolan (1261) + TX, mesulfen (alternative name) [CCN] + TX, methacrifos (1266) + TX, methamidophos (527) + TX, methidathion (529) + TX, methiocarb (530) + TX, methomyl (531) + TX, 40 methyl bromide (537) + TX, metolcarb (550) + TX, mevinphos (556) + TX, mexacarbate (1290) + TX,

milbemectin (557) + TX, milbemycin oxime (alternative name) [CCN] + TX, mipafox (1293) + TX, monocrotophos (561) + TX, morphothion (1300) + TX, moxidectin (alternative name) [CCN] + TX, naled (567) + TX, NC-184 (compound code) + TX, NC-512 (compound code) + TX, nifluridide (1309) + TX, nikkomycins (alternative name) [CCN] + TX, nitrilacarb (1313) + TX, nitrilacarb 1:1 zinc chloride complex (1313) + TX, NNI-0101 (compound code) + TX, NNI-0250 (compound code) + TX, omethoate (594) + TX, oxamyl (602) + TX, oxydeprofos (1324) + TX, oxydisulfoton (1325) + TX, pp'-DDT (219) + TX, parathion (615) + TX, permethrin (626) + TX, petroleum oils (alternative name) (628) + TX, phenkapton (1330) + TX, phenthoate (631) + TX, phorate (636) + TX, phosalone (637) + TX, phosfolan (1338) + TX, phosmet (638) + TX, phosphamidon (639) + TX, phoxim (642) + TX, pirimiphos-methyl (652) + TX, polychloroterpenes (traditional name) (1347) + TX, polynactins (alternative name) (653) + TX, proclonol (1350) + TX, profenofos (662) + TX, promacyl (1354) + TX, propargite (671) + TX, propetamphos (673) + TX, propoxur (678) + TX, prothidathion (1360) + TX, prothoate (1362) + TX, pyrethrin I (696) + TX, pyrethrin II (696) + TX, pyrethrins (696) + TX, pyridaben (699) + TX, pyridaphenthion (701) + TX, pyrimidifen (706) + TX, pyrimitate (1370) + TX, quinalphos (711) + TX, quintiofos (1381) + TX, R-1492 (development code) (1382) + TX, RA-17 (development code) (1383) + TX, rotenone (722) + TX, schradan (1389) + TX, sebufos (alternative name) + TX, selamectin (alternative name) [CCN] + TX, SI-0009 (compound code) + TX, sophamide (1402) + TX, spirodiclofen (738) + TX, spiromesifen (739) + TX, SSI-121 (development code) (1404) + TX, sulfiram (alternative name) [CCN] + TX, sulfluramid (750) + TX, sulfotep (753) + TX, sulfur (754) + TX, SZI-121 (development code) (757) + TX, tau-fluvalinate (398) + TX, tebufenpyrad (763) + TX, TEPP (1417) + TX, terbam (alternative name) + TX, tetrachlorvinphos (777) + TX, tetradifon (786) + TX, tetranactin (alternative name) (653) + TX, tetrasul (1425) + TX, thiafenox (alternative name) + TX, thiocarboxime (1431) + TX, thiofanox (800) + TX, thiometon (801) + TX, thioquinox (1436) + TX, thuringiensin (alternative name) [CCN] + TX, triamiphos (1441) + TX, triarathene (1443) + TX, triazophos (820) + TX, triazuron (alternative name) + TX, trichlorfon (824) + TX, trifenofos (1455) + TX, trinactin (alternative name) (653) + TX, vamidothion (847) + TX, vaniliprole [CCN] and YI-5302 (compound code) + TX,

an algicide selected from the group of substances consisting of bethoxazin [CCN] + TX, copper dioctanoate (IUPAC name) (170) + TX, copper sulfate (172) + TX, cybutryne [CCN] + TX, dichlone (1052) + TX, dichlorophen (232) + TX, endothal (295) + TX, fentin (347) + TX, hydrated lime [CCN] + TX, nabam (566) + TX, quinclamine (714) + TX, quinonamid (1379) + TX, simazine (730) + TX, triphenyltin acetate (IUPAC name) (347) and triphenyltin hydroxide (IUPAC name) (347) + TX,

an anthelmintic selected from the group of substances consisting of abamectin (1) + TX, crufomate (1011) + TX, doramectin (alternative name) [CCN] + TX, emamectin (291) + TX, emamectin benzoate (291) + TX, eprinomectin (alternative name) [CCN] + TX, ivermectin (alternative name) [CCN] + TX, milbemycin oxime (alternative name) [CCN] + TX, moxidectin (alternative name) [CCN] + TX, piperazine [CCN] + TX, selamectin (alternative name) [CCN] + TX, spinosad (737) and thiophanate (1435) + TX,

an avicide selected from the group of substances consisting of chloralose (127) + TX, endrin (1122) + TX, fenthion (346) + TX, pyridin-4-amine (IUPAC name) (23) and strychnine (745) + TX,

a bactericide selected from the group of substances consisting of 1-hydroxy-1*H*-pyridine-2-thione (IUPAC name) (1222) + TX, 4-(quinoxalin-2-ylamino)benzenesulfonamide (IUPAC name) (748) + TX, 8-hydroxyquinoline sulfate (446) + TX, bronopol (97) + TX, copper dioctanoate (IUPAC name) (170) + TX, copper hydroxide (IUPAC name) (169) + TX, cresol [CCN] + TX, dichlorophen (232) + TX, dipyrithione (1105) + TX, dodicin (1112) + TX, fenaminosulf (1144) + TX, formaldehyde (404) + TX, hydrargaphen (alternative name) [CCN] + TX, kasugamycin (483) + TX, kasugamycin hydrochloride hydrate (483) + TX, nickel bis(dimethyldithiocarbamate) (IUPAC name) (1308) + TX, nitrapyrin (580) + TX, octhilinone (590) + TX, oxolinic acid (606) + TX, oxytetracycline (611) + TX, potassium hydroxyquinoline sulfate (446) + TX, probenazole (658) + TX, streptomycin (744) + TX, streptomycin sesquisulfate (744) + TX, tecloftalam (766) + TX, and thiomersal (alternative name) [CCN] + TX,

a biological agent selected from the group of substances consisting of *Adoxophyes orana* GV (alternative name) (12) + TX, *Agrobacterium radiobacter* (alternative name) (13) + TX, *Amblyseius* spp. (alternative name) (19) + TX, *Anagrapha falcifera* NPV (alternative name) (28) + TX, *Anagrus atomus* (alternative name) (29) + TX, *Aphelinus abdominalis* (alternative name) (33) + TX, *Aphidius colemani* (alternative name) (34) + TX, *Aphidoletes aphidimyza* (alternative name) (35) + TX, *Autographa californica* NPV (alternative name) (38) + TX, *Bacillus firmus* (alternative name) (48) + TX, *Bacillus sphaericus* Neide (scientific name) (49) + TX, *Bacillus thuringiensis* Berliner (scientific name) (51) + TX, *Bacillus thuringiensis* subsp. *aizawai* (scientific name) (51) + TX, *Bacillus thuringiensis* subsp. *israelensis* (scientific name) (51) + TX, *Bacillus thuringiensis* subsp. *japonensis* (scientific name) (51) + TX, *Bacillus thuringiensis* subsp. *kurstaki* (scientific name) (51) + TX, *Bacillus thuringiensis* subsp. *tenebrionis* (scientific name) (51) + TX, *Beauveria bassiana* (alternative name) (53) + TX, *Beauveria brongniartii* (alternative name) (54) + TX, *Chrysoperla carnea* (alternative name) (151) + TX, *Cryptolaemus montrouzieri* (alternative name) (178) + TX, *Cydia pomonella* GV (alternative name) (191) + TX, *Dacnusa sibirica* (alternative name) (212) + TX, *Diglyphus isaea* (alternative name) (254) + TX, *Encarsia formosa* (scientific name) (293) + TX, *Eretmocerus eremicus* (alternative name) (300) + TX, *Helicoverpa zea* NPV (alternative name) (431) + TX, *Heterorhabditis bacteriophora* and *H. megidis* (alternative name) (433) + TX, *Hippodamia convergens* (alternative name) (442) + TX, *Leptomastix dactylopii* (alternative name) (488) + TX, *Macrolophus caliginosus* (alternative name) (491) + TX, *Mamestra brassicae* NPV (alternative name) (494) + TX, *Metaphycus helvolus* (alternative name) (522) + TX, *Metarhizium anisopliae* var. *acridum* (scientific name) (523) + TX, *Metarhizium anisopliae* var. *anisopliae* (scientific name) (523) + TX, *Neodiprion sertifer* NPV and *N. lecontei* NPV (alternative name) (575) + TX, *Orius* spp. (alternative name) (596) + TX, *Paecilomyces fumosoroseus* (alternative name) (613) + TX, *Phytoseiulus persimilis* (alternative name) (644) + TX, *Spodoptera exigua* multicapsid nuclear polyhedrosis virus (scientific name) (741) + TX, *Steinernema bibionis* (alternative name) (742) + TX, *Steinernema carpocapsae* (alternative name) (742) + TX, *Steinernema feltiae* (alternative name) (742) + TX, *Steinernema glaseri* (alternative name) (742) + TX, *Steinernema riobrave* (alternative name) (742) + TX, *Steinernema riobravus* (alternative name) (742) + TX, *Steinernema scapterisci* (alternative name) (742) + TX, *Steinernema* spp. (alternative name) (742) + TX, *Trichogramma* spp. (alternative name) (826) + TX, *Typhlodromus occidentalis* (alternative name) (844) and *Verticillium lecanii* (alternative name) (848) + TX, *bacillus subtilis* var. *amyloliquefaciens* Strain

FZB24 (available from Novozymes Biologicals Inc., 5400 Corporate Circle, Salem, VA 24153, U.S.A. and known under the trade name Taegro®) + TX,

a soil sterilant selected from the group of substances consisting of iodomethane (IUPAC name) (542) and methyl bromide (537) + TX,

5 a chemosterilant selected from the group of substances consisting of apholate [CCN] + TX, bisazir (alternative name) [CCN] + TX, busulfan (alternative name) [CCN] + TX, diflubenzuron (250) + TX, dimatif (alternative name) [CCN] + TX, hemel [CCN] + TX, hempa [CCN] + TX, metepa [CCN] + TX, methiotepa [CCN] + TX, methyl apholate [CCN] + TX, morzid [CCN] + TX, penfluron (alternative name) [CCN] + TX, tepa [CCN] + TX, thiohempa (alternative name) [CCN] + TX, thiotepa (alternative name) [CCN] + TX, tretamine (alternative name) [CCN] and uredepa (alternative name) [CCN] + TX,

an insect pheromone selected from the group of substances consisting of (*E*)-dec-5-en-1-yl acetate with (*E*)-dec-5-en-1-ol (IUPAC name) (222) + TX, (*E*)-tridec-4-en-1-yl acetate (IUPAC name) (829) + TX, (*E*)-6-methylhept-2-en-4-ol (IUPAC name) (541) + TX, (*E,Z*)-tetradeca-4,10-dien-1-yl acetate (IUPAC name) (779) + TX, (*Z*)-dodec-7-en-1-yl acetate (IUPAC name) (285) + TX, (*Z*)-hexadec-11-enal (IUPAC name) (436) + TX, (*Z*)-hexadec-11-en-1-yl acetate (IUPAC name) (437) + TX, (*Z*)-hexadec-13-en-11-yn-1-yl acetate (IUPAC name) (438) + TX, (*Z*)-icos-13-en-10-one (IUPAC name) (448) + TX, (*Z*)-tetradec-7-en-1-ol (IUPAC name) (782) + TX, (*Z*)-tetradec-9-en-1-ol (IUPAC name) (783) + TX, (*Z*)-tetradec-9-en-1-yl acetate (IUPAC name) (784) + TX, (*7E,9Z*)-dodeca-7,9-dien-1-yl acetate (IUPAC name) (283) + TX, (*9Z,11E*)-tetradeca-9,11-dien-1-yl acetate (IUPAC name) (780) + TX, (*9Z,12E*)-tetradeca-9,12-dien-1-yl acetate (IUPAC name) (781) + TX, 14-methyloctadec-1-ene (IUPAC name) (545) + TX, 4-methylnonan-5-ol with 4-methylnonan-5-one (IUPAC name) (544) + TX, alpha-multistriatin (alternative name) [CCN] + TX, brevicomin (alternative name) [CCN] + TX, codlure (alternative name) [CCN] + TX, codlemone (alternative name) (167) + TX, cuelure (alternative name) (179) + TX, disparlure (277) + TX, dodec-8-en-1-yl acetate (IUPAC name) (286) + TX, dodec-9-en-1-yl acetate (IUPAC name) (287) + TX, dodeca-8 + TX, 10-dien-1-yl acetate (IUPAC name) (284) + TX, dominicalure (alternative name) [CCN] + TX, ethyl 4-methyloctanoate (IUPAC name) (317) + TX, eugenol (alternative name) [CCN] + TX, frontalinal (alternative name) [CCN] + TX, gossyplure (alternative name) (420) + TX, grandlure (421) + TX, grandlure I (alternative name) (421) + TX, grandlure II (alternative name) (421) + TX, grandlure III (alternative name) (421) + TX, grandlure IV (alternative name) (421) + TX, hexalure [CCN] + TX, ipsdienol (alternative name) [CCN] + TX, ipsenol (alternative name) [CCN] + TX, japonilure (alternative name) (481) + TX, lineatin (alternative name) [CCN] + TX, litlure (alternative name) [CCN] + TX, looplure (alternative name) [CCN] + TX, medlure [CCN] + TX, megatomoic acid (alternative name) [CCN] + TX, methyl eugenol (alternative name) (540) + TX, muscalure (563) + TX, octadeca-2,13-dien-1-yl acetate (IUPAC name) (588) + TX, octadeca-3,13-dien-1-yl acetate (IUPAC name) (589) + TX, orfralure (alternative name) [CCN] + TX, oryctalure (alternative name) (317) + TX, ostramone (alternative name) [CCN] + TX, siglure [CCN] + TX, sordidin (alternative name) (736) + TX, sulcatol (alternative name) [CCN] + TX, tetradec-11-en-1-yl acetate (IUPAC name) (785) + TX, trimedlure (839) + TX, trimedlure A (alternative name) (839) + TX, trimedlure B₁ (alternative name) (839) + TX, trimedlure B₂ (alternative name) (839) + TX, trimedlure C (alternative name) (839) and trunc-call (alternative name) [CCN] + TX,

an insect repellent selected from the group of substances consisting of 2-(octylthio)ethanol (IUPAC name) (591) + TX, butopyronoxyl (933) + TX, butoxy(polypropylene glycol) (936) + TX, dibutyl adipate (IUPAC name) (1046) + TX, dibutyl phthalate (1047) + TX, dibutyl succinate (IUPAC name) (1048) + TX, diethyltoluamide [CCN] + TX, dimethyl carbate [CCN] + TX, dimethyl phthalate [CCN] + TX, ethyl hexanediol (1137) + TX, hexamide [CCN] + TX, methoquin-butyl (1276) + TX, methylnodecanamide [CCN] + TX, oxamate [CCN] and picaridin [CCN] + TX,

an insecticide selected from the group of substances consisting of 1-dichloro-1-nitroethane (IUPAC/Chemical Abstracts name) (1058) + TX, 1,1-dichloro-2,2-bis(4-ethylphenyl)ethane (IUPAC name) (1056), + TX, 1,2-dichloropropane (IUPAC/Chemical Abstracts name) (1062) + TX, 1,2-dichloropropane with 1,3-dichloropropene (IUPAC name) (1063) + TX, 1-bromo-2-chloroethane (IUPAC/Chemical Abstracts name) (916) + TX, 2,2,2-trichloro-1-(3,4-dichlorophenyl)ethyl acetate (IUPAC name) (1451) + TX, 2,2-dichlorovinyl 2-ethylsulfinyethyl methyl phosphate (IUPAC name) (1066) + TX, 2-(1,3-dithiolan-2-yl)phenyl dimethylcarbamate (IUPAC/ Chemical Abstracts name) (1109) + TX, 2-(2-butoxyethoxy)ethyl thiocyanate (IUPAC/Chemical Abstracts name) (935) + TX, 2-(4,5-dimethyl-1,3-dioxolan-2-yl)phenyl methylcarbamate (IUPAC/ Chemical Abstracts name) (1084) + TX, 2-(4-chloro-3,5-xylyloxy)ethanol (IUPAC name) (986) + TX, 2-chlorovinyl diethyl phosphate (IUPAC name) (984) + TX, 2-imidazolidone (IUPAC name) (1225) + TX, 2-isovalerylindan-1,3-dione (IUPAC name) (1246) + TX, 2-methyl(prop-2-ynyl)aminophenyl methylcarbamate (IUPAC name) (1284) + TX, 2-thiocyanatoethyl laurate (IUPAC name) (1433) + TX, 3-bromo-1-chloroprop-1-ene (IUPAC name) (917) + TX, 3-methyl-1-phenylpyrazol-5-yl dimethylcarbamate (IUPAC name) (1283) + TX, 4-methyl(prop-2-ynyl)amino-3,5-xylyl methylcarbamate (IUPAC name) (1285) + TX, 5,5-dimethyl-3-oxocyclohex-1-enyl dimethylcarbamate (IUPAC name) (1085) + TX, abamectin (1) + TX, acephate (2) + TX, acetamiprid (4) + TX, acethion (alternative name) [CCN] + TX, acetoprole [CCN] + TX, acrinathrin (9) + TX, acrylonitrile (IUPAC name) (861) + TX, alanycarb (15) + TX, aldicarb (16) + TX, aldoxycarb (863) + TX, aldrin (864) + TX, allethrin (17) + TX, allosamidin (alternative name) [CCN] + TX, allyxycarb (866) + TX, alpha-cypermethrin (202) + TX, alpha-ecdysone (alternative name) [CCN] + TX, aluminium phosphide (640) + TX, amidithion (870) + TX, amidothioate (872) + TX, aminocarb (873) + TX, amiton (875) + TX, amiton hydrogen oxalate (875) + TX, amitraz (24) + TX, anabasine (877) + TX, athidathion (883) + TX, AVI 382 (compound code) + TX, AZ 60541 (compound code) + TX, azadirachtin (alternative name) (41) + TX, azamethiphos (42) + TX, azinphos-ethyl (44) + TX, azinphos-methyl (45) + TX, azothoate (889) + TX, *Bacillus thuringiensis* delta endotoxins (alternative name) (52) + TX, barium hexafluorosilicate (alternative name) [CCN] + TX, barium polysulfide (IUPAC/Chemical Abstracts name) (892) + TX, barthrin [CCN] + TX, Bayer 22/190 (development code) (893) + TX, Bayer 22408 (development code) (894) + TX, bendiocarb (58) + TX, benfuracarb (60) + TX, bensultap (66) + TX, beta-cyfluthrin (194) + TX, beta-cypermethrin (203) + TX, bifenthrin (76) + TX, bioallethrin (78) + TX, bioallethrin S-cyclopentenyl isomer (alternative name) (79) + TX, bioethanomethrin [CCN] + TX, biopermethrin (908) + TX, bioresmethrin (80) + TX, bis(2-chloroethyl) ether (IUPAC name) (909) + TX, bistrifluron (83) + TX, borax (86) + TX, brofenvalerate (alternative name) + TX, bromfenvinfos (914) + TX, bromocyclen (918) + TX, bromo-DDT (alternative name) [CCN] + TX, bromophos (920) + TX, bromophos-ethyl (921) + TX, bufencarb (924) + TX, buprofezin (99) + TX, butacarb (926) + TX,

butathiofos (927) + TX, butocarboxim (103) + TX, butonate (932) + TX, butoxycarboxim (104) + TX,
 butylpyridaben (alternative name) + TX, cadusafos (109) + TX, calcium arsenate [CCN] + TX, calcium
 cyanide (444) + TX, calcium polysulfide (IUPAC name) (111) + TX, camphechlor (941) + TX,
 carbanolate (943) + TX, carbaryl (115) + TX, carbofuran (118) + TX, carbon disulfide (IUPAC/Chemical
 5 Abstracts name) (945) + TX, carbon tetrachloride (IUPAC name) (946) + TX, carbophenothion (947) +
 TX, carbosulfan (119) + TX, cartap (123) + TX, cartap hydrochloride (123) + TX, cevadine (alternative
 name) (725) + TX, chlorbicyclen (960) + TX, chlordane (128) + TX, chlordecone (963) + TX,
 chlordimeform (964) + TX, chlordimeform hydrochloride (964) + TX, chlorethoxyfos (129) + TX,
 chlorfenapyr (130) + TX, chlorfenvinphos (131) + TX, chlorfluaazuron (132) + TX, chlormephos (136) +
 10 TX, chloroform [CCN] + TX, chloropicrin (141) + TX, chlorphoxim (989) + TX, chlorprazophos (990) +
 TX, chlorpyrifos (145) + TX, chlorpyrifos-methyl (146) + TX, chlorthiophos (994) + TX, chromafenozide
 (150) + TX, cinerin I (696) + TX, cinerin II (696) + TX, cinerins (696) + TX, cis-resmethrin (alternative
 name) + TX, cismethrin (80) + TX, clocythrin (alternative name) + TX, cloethocarb (999) + TX, closantel
 (alternative name) [CCN] + TX, clothianidin (165) + TX, copper acetoarsenite [CCN] + TX, copper
 15 arsenate [CCN] + TX, copper oleate [CCN] + TX, coumaphos (174) + TX, coumithoate (1006) + TX,
 crotamiton (alternative name) [CCN] + TX, crotoxyphos (1010) + TX, crufomate (1011) + TX, cryolite
 (alternative name) (177) + TX, CS 708 (development code) (1012) + TX, cyanofenphos (1019) + TX,
 cyanophos (184) + TX, cyanthoate (1020) + TX, cyclethrin [CCN] + TX, cycloprothrin (188) + TX,
 cyfluthrin (193) + TX, cyhalothrin (196) + TX, cypermethrin (201) + TX, cyphenothrin (206) + TX,
 20 cyromazine (209) + TX, cythioate (alternative name) [CCN] + TX, *d*-limonene (alternative name) [CCN]
 + TX, *d*-tetramethrin (alternative name) (788) + TX, DAEP (1031) + TX, dazomet (216) + TX, DDT (219)
 + TX, decarbofuran (1034) + TX, deltamethrin (223) + TX, demephion (1037) + TX, demephion-O (1037)
 + TX, demephion-S (1037) + TX, demeton (1038) + TX, demeton-methyl (224) + TX, demeton-O (1038)
 + TX, demeton-O-methyl (224) + TX, demeton-S (1038) + TX, demeton-S-methyl (224) + TX, demeton-
 25 S-methylsulphon (1039) + TX, diafenthiuron (226) + TX, dialifos (1042) + TX, diamidafos (1044) + TX,
 diazinon (227) + TX, dicapthon (1050) + TX, dichlofenthion (1051) + TX, dichlorvos (236) + TX, dicliphos
 (alternative name) + TX, dicresyl (alternative name) [CCN] + TX, dicrotophos (243) + TX, dicyclanil
 (244) + TX, dieldrin (1070) + TX, diethyl 5-methylpyrazol-3-yl phosphate (IUPAC name) (1076) + TX,
 diflubenzuron (250) + TX, dilor (alternative name) [CCN] + TX, dimefluthrin [CCN] + TX, dimefox (1081)
 30 + TX, dimetan (1085) + TX, dimethoate (262) + TX, dimethrin (1083) + TX, dimethylvinphos (265) + TX,
 dimetilan (1086) + TX, dinex (1089) + TX, dinex-diclexine (1089) + TX, dinoprop (1093) + TX, dinosam
 (1094) + TX, dinoseb (1095) + TX, dinotefuran (271) + TX, diofenolan (1099) + TX, dioxabenzofos
 (1100) + TX, dioxacarb (1101) + TX, dioxathion (1102) + TX, disulfoton (278) + TX, dithicrofos (1108)
 + TX, DNOC (282) + TX, doramectin (alternative name) [CCN] + TX, DSP (1115) + TX, ecdysterone
 35 (alternative name) [CCN] + TX, EI 1642 (development code) (1118) + TX, emamectin (291) + TX,
 emamectin benzoate (291) + TX, EMPC (1120) + TX, empenthrin (292) + TX, endosulfan (294) + TX,
 endothion (1121) + TX, endrin (1122) + TX, EPBP (1123) + TX, EPN (297) + TX, epofenonane (1124)
 + TX, eprinomectin (alternative name) [CCN] + TX, esfenvalerate (302) + TX, etaphos (alternative
 name) [CCN] + TX, ethiofencarb (308) + TX, ethion (309) + TX, ethiprole (310) + TX, ethoate-methyl
 40 (1134) + TX, ethoprophos (312) + TX, ethyl formate (IUPAC name) [CCN] + TX, ethyl-DDD (alternative

name) (1056) + TX, ethylene dibromide (316) + TX, ethylene dichloride (chemical name) (1136) + TX, ethylene oxide [CCN] + TX, etofenprox (319) + TX, etrimfos (1142) + TX, EXD (1143) + TX, famphur (323) + TX, fenamiphos (326) + TX, fenazaflor (1147) + TX, fenchlorphos (1148) + TX, fenethacarb (1149) + TX, fenfluthrin (1150) + TX, fenitrothion (335) + TX, fenobucarb (336) + TX, fenoxacrim (1153) + TX, fenoxycarb (340) + TX, fenpirithrin (1155) + TX, fenpropathrin (342) + TX, fenpyrad (alternative name) + TX, fensulfothion (1158) + TX, fenthion (346) + TX, fenthion-ethyl [CCN] + TX, fenvalerate (349) + TX, fipronil (354) + TX, flonicamid (358) + TX, flubendiamide (CAS. Reg. No.: 272451-65-7) + TX, flucofuron (1168) + TX, flucycloxuron (366) + TX, flucythrinate (367) + TX, fluenetil (1169) + TX, flufenerim [CCN] + TX, flufenoxuron (370) + TX, flufenprox (1171) + TX, flumethrin (372) + TX, fluvalinate (1184) + TX, FMC 1137 (development code) (1185) + TX, fonofos (1191) + TX, formetanate (405) + TX, formetanate hydrochloride (405) + TX, formothion (1192) + TX, formparanate (1193) + TX, fosmethilan (1194) + TX, fospirate (1195) + TX, fosthiazate (408) + TX, fosthietan (1196) + TX, furathiocarb (412) + TX, furethrin (1200) + TX, gamma-cyhalothrin (197) + TX, gamma-HCH (430) + TX, guazatine (422) + TX, guazatine acetates (422) + TX, GY-81 (development code) (423) + TX, halfenprox (424) + TX, halofenozide (425) + TX, HCH (430) + TX, HEOD (1070) + TX, heptachlor (1211) + TX, heptenophos (432) + TX, heterophos [CCN] + TX, hexaflumuron (439) + TX, HHDN (864) + TX, hydramethylnon (443) + TX, hydrogen cyanide (444) + TX, hydroprene (445) + TX, hyquincarb (1223) + TX, imidacloprid (458) + TX, imiprothrin (460) + TX, indoxacarb (465) + TX, iodomethane (IUPAC name) (542) + TX, IPSP (1229) + TX, isazofos (1231) + TX, isobenzan (1232) + TX, isocarbophos (alternative name) (473) + TX, isodrin (1235) + TX, isofenphos (1236) + TX, isolane (1237) + TX, isoprocarb (472) + TX, isopropyl O-(methoxyaminothiophosphoryl)salicylate (IUPAC name) (473) + TX, isoprothiolane (474) + TX, isothioate (1244) + TX, isoxathion (480) + TX, ivermectin (alternative name) [CCN] + TX, jasmolins I (696) + TX, jasmolins II (696) + TX, jodfenphos (1248) + TX, juvenile hormone I (alternative name) [CCN] + TX, juvenile hormone II (alternative name) [CCN] + TX, juvenile hormone III (alternative name) [CCN] + TX, kelevan (1249) + TX, kinoprene (484) + TX, lambda-cyhalothrin (198) + TX, lead arsenate [CCN] + TX, lepimectin (CCN) + TX, leptophos (1250) + TX, lindane (430) + TX, lirimfos (1251) + TX, lufenuron (490) + TX, lythidathion (1253) + TX, *m*-cumenyl methylcarbamate (IUPAC name) (1014) + TX, magnesium phosphide (IUPAC name) (640) + TX, malathion (492) + TX, malonoben (1254) + TX, mazidox (1255) + TX, mecarbam (502) + TX, mecarphon (1258) + TX, menazon (1260) + TX, mephosfolan (1261) + TX, mercurous chloride (513) + TX, mesulfenfos (1263) + TX, metaflumizone (CCN) + TX, metam (519) + TX, metam-potassium (alternative name) (519) + TX, metam-sodium (519) + TX, methacrifos (1266) + TX, methamidophos (527) + TX, methanesulfonyl fluoride (IUPAC/Chemical Abstracts name) (1268) + TX, methidathion (529) + TX, methiocarb (530) + TX, methocrotophos (1273) + TX, methomyl (531) + TX, methoprene (532) + TX, methoquin-butyl (1276) + TX, methothrin (alternative name) (533) + TX, methoxychlor (534) + TX, methoxyfenozide (535) + TX, methyl bromide (537) + TX, methyl isothiocyanate (543) + TX, methylchloroform (alternative name) [CCN] + TX, methylene chloride [CCN] + TX, metofluthrin [CCN] + TX, metolcarb (550) + TX, metoxadiazone (1288) + TX, mevinphos (556) + TX, mexacarbate (1290) + TX, milbemectin (557) + TX, milbemycin oxime (alternative name) [CCN] + TX, mipafox (1293) + TX, mirex (1294) + TX, monocrotophos (561) + TX, morphothion (1300) + TX, moxidectin (alternative name) [CCN] + TX,

naftalofos (alternative name) [CCN] + TX, naled (567) + TX, naphthalene (IUPAC/Chemical Abstracts name) (1303) + TX, NC-170 (development code) (1306) + TX, NC-184 (compound code) + TX, nicotine (578) + TX, nicotine sulfate (578) + TX, nifluridide (1309) + TX, nitenpyram (579) + TX, nithiazine (1311) + TX, nitrilacarb (1313) + TX, nitrilacarb 1:1 zinc chloride complex (1313) + TX, NNI-0101 (compound code) + TX, NNI-0250 (compound code) + TX, nornicotine (traditional name) (1319) + TX, novaluron (585) + TX, noviflumuron (586) + TX, O-5-dichloro-4-iodophenyl O-ethyl ethylphosphonothioate (IUPAC name) (1057) + TX, O,O-diethyl O-4-methyl-2-oxo-2H-chromen-7-yl phosphorothioate (IUPAC name) (1074) + TX, O,O-diethyl O-6-methyl-2-propylpyrimidin-4-yl phosphorothioate (IUPAC name) (1075) + TX, O,O,O',O'-tetrapropyl dithiopyrophosphate (IUPAC name) (1424) + TX, oleic acid (IUPAC name) (593) + TX, omethoate (594) + TX, oxamyl (602) + TX, oxydemeton-methyl (609) + TX, oxydeprofos (1324) + TX, oxydisulfoton (1325) + TX, pp'-DDT (219) + TX, para-dichlorobenzene [CCN] + TX, parathion (615) + TX, parathion-methyl (616) + TX, penfluron (alternative name) [CCN] + TX, pentachlorophenol (623) + TX, pentachlorophenyl laurate (IUPAC name) (623) + TX, permethrin (626) + TX, petroleum oils (alternative name) (628) + TX, PH 60-38 (development code) (1328) + TX, phenkapton (1330) + TX, phenothrin (630) + TX, phenthoate (631) + TX, phorate (636) + TX, phosalone (637) + TX, phosfolan (1338) + TX, phosmet (638) + TX, phosnichlor (1339) + TX, phosphamidon (639) + TX, phosphine (IUPAC name) (640) + TX, phoxim (642) + TX, phoxim-methyl (1340) + TX, pirimetaphos (1344) + TX, pirimicarb (651) + TX, pirimiphos-ethyl (1345) + TX, pirimiphos-methyl (652) + TX, polychlorodicyclopentadiene isomers (IUPAC name) (1346) + TX, polychloroterpenes (traditional name) (1347) + TX, potassium arsenite [CCN] + TX, potassium thiocyanate [CCN] + TX, prallethrin (655) + TX, precocene I (alternative name) [CCN] + TX, precocene II (alternative name) [CCN] + TX, precocene III (alternative name) [CCN] + TX, primidophos (1349) + TX, profenofos (662) + TX, profluthrin [CCN] + TX, promacyl (1354) + TX, promecarb (1355) + TX, propaphos (1356) + TX, propetamphos (673) + TX, propoxur (678) + TX, prothidathion (1360) + TX, prothiofos (686) + TX, prothoate (1362) + TX, protrifenbute [CCN] + TX, pymetrozine (688) + TX, pyraclofos (689) + TX, pyrazophos (693) + TX, pyresmethrin (1367) + TX, pyrethrin I (696) + TX, pyrethrin II (696) + TX, pyrethrins (696) + TX, pyridaben (699) + TX, pyridalyl (700) + TX, pyridaphenthion (701) + TX, pyrimidifen (706) + TX, pyrimitate (1370) + TX, pyriproxyfen (708) + TX, quassia (alternative name) [CCN] + TX, quinalphos (711) + TX, quinalphos-methyl (1376) + TX, quinothion (1380) + TX, quintiofos (1381) + TX, R-1492 (development code) (1382) + TX, rafoxanide (alternative name) [CCN] + TX, resmethrin (719) + TX, rotenone (722) + TX, RU 15525 (development code) (723) + TX, RU 25475 (development code) (1386) + TX, ryania (alternative name) (1387) + TX, ryanodine (traditional name) (1387) + TX, sabadilla (alternative name) (725) + TX, schradan (1389) + TX, sebufos (alternative name) + TX, selamectin (alternative name) [CCN] + TX, SI-0009 (compound code) + TX, SI-0205 (compound code) + TX, SI-0404 (compound code) + TX, SI-0405 (compound code) + TX, silafluofen (728) + TX, SN 72129 (development code) (1397) + TX, sodium arsenite [CCN] + TX, sodium cyanide (444) + TX, sodium fluoride (IUPAC/Chemical Abstracts name) (1399) + TX, sodium hexafluorosilicate (1400) + TX, sodium pentachlorophenoxide (623) + TX, sodium selenate (IUPAC name) (1401) + TX, sodium thiocyanate [CCN] + TX, sophamide (1402) + TX, spinosad (737) + TX, spiromesifen (739) + TX, spirotetmat (CCN) + TX, sulcofuron (746) + TX, sulcofuron-sodium (746) + TX, sulfluramid (750) + TX,

sulfotep (753) + TX, sulfuryl fluoride (756) + TX, sulprofos (1408) + TX, tar oils (alternative name) (758) + TX, tau-fluvalinate (398) + TX, tazimcarb (1412) + TX, TDE (1414) + TX, tebufenozide (762) + TX, tebufenpyrad (763) + TX, tebupirimfos (764) + TX, teflubenzuron (768) + TX, tefluthrin (769) + TX, temephos (770) + TX, TEPP (1417) + TX, terallethrin (1418) + TX, terbam (alternative name) + TX, 5 terbufos (773) + TX, tetrachloroethane [CCN] + TX, tetrachlorvinphos (777) + TX, tetramethrin (787) + TX, theta-cypermethrin (204) + TX, thiacloprid (791) + TX, thiafenox (alternative name) + TX, thiamethoxam (792) + TX, thicofos (1428) + TX, thiocarboxime (1431) + TX, thiocyclam (798) + TX, thiocyclam hydrogen oxalate (798) + TX, thiodicarb (799) + TX, thiofanox (800) + TX, thiometon (801) + TX, thionazin (1434) + TX, thiosultap (803) + TX, thiosultap-sodium (803) + TX, thuringiensin 10 (alternative name) [CCN] + TX, tolfenpyrad (809) + TX, tralomethrin (812) + TX, transfluthrin (813) + TX, transpermethrin (1440) + TX, triamiphos (1441) + TX, triazamate (818) + TX, triazophos (820) + TX, triazuron (alternative name) + TX, trichlorfon (824) + TX, trichlormetaphos-3 (alternative name) [CCN] + TX, trichloronat (1452) + TX, trifenofos (1455) + TX, triflumuron (835) + TX, trimethacarb (840) + TX, triprene (1459) + TX, vamidothion (847) + TX, vaniliprole [CCN] + TX, veratridine (alternative 15 name) (725) + TX, veratrine (alternative name) (725) + TX, XMC (853) + TX, xylylcarb (854) + TX, YI-5302 (compound code) + TX, zeta-cypermethrin (205) + TX, zetamethrin (alternative name) + TX, zinc phosphide (640) + TX, zolaprofos (1469) and ZXI 8901 (development code) (858) + TX, cyantraniliprole [736994-63-19 + TX, chlorantraniliprole [500008-45-7] + TX, cyenopyrafen [560121-52-0] + TX, cyflumetofen [400882-07-7] + TX, pyrifluquinazon [337458-27-2] + TX, spinetoram [187166-40-1 + 187166-15-0] + TX, spirotetramat [203313-25-1] + TX, sulfoxaflor [946578-00-3] + TX, flufiprole 20 [704886-18-0] + TX, meperfluthrin [915288-13-0] + TX, tetramethylfluthrin [84937-88-2] + TX, triflumezopyrim (disclosed in WO 2012/092115) + TX,

a molluscicide selected from the group of substances consisting of bis(tributyltin) oxide (IUPAC name) (913) + TX, bromoacetamide [CCN] + TX, calcium arsenate [CCN] + TX, cloethocarb (999) + 25 TX, copper acetoarsenite [CCN] + TX, copper sulfate (172) + TX, fentin (347) + TX, ferric phosphate (IUPAC name) (352) + TX, metaldehyde (518) + TX, methiocarb (530) + TX, niclosamide (576) + TX, niclosamide-olamine (576) + TX, pentachlorophenol (623) + TX, sodium pentachlorophenoxide (623) + TX, tazimcarb (1412) + TX, thiodicarb (799) + TX, tributyltin oxide (913) + TX, trifenmorph (1454) + TX, trimethacarb (840) + TX, triphenyltin acetate (IUPAC name) (347) and triphenyltin hydroxide (IUPAC 30 name) (347) + TX, pyriprole [394730-71-3] + TX,

a nematocide selected from the group of substances consisting of AKD-3088 (compound code) + TX, 1,2-dibromo-3-chloropropane (IUPAC/Chemical Abstracts name) (1045) + TX, 1,2-dichloropropane (IUPAC/ Chemical Abstracts name) (1062) + TX, 1,2-dichloropropane with 1,3-dichloropropene (IUPAC name) (1063) + TX, 1,3-dichloropropene (233) + TX, 3,4-dichlorotetrahydrothiophene 1,1-dioxide (IUPAC/Chemical Abstracts name) (1065) + TX, 3-(4-chlorophenyl)-5-methylrhodanine (IUPAC name) (980) + TX, 5-methyl-6-thioxo-1,3,5-thiadiazinan-3-ylacetic acid (IUPAC name) (1286) + TX, 6-isopentenylaminopurine (alternative name) (210) + TX, abamectin (1) + TX, acetoprole [CCN] + TX, alanycarb (15) + TX, aldicarb (16) + TX, aldoxycarb (863) + TX, AZ 60541 (compound code) + TX, benclothiaz [CCN] + TX, benomyl (62) + TX, butylpyridaben 40 (alternative name) + TX, cadusafos (109) + TX, carbofuran (118) + TX, carbon disulfide (945) + TX,

carbosulfan (119) + TX, chloropicrin (141) + TX, chlorpyrifos (145) + TX, cloethocarb (999) + TX, cytokinins (alternative name) (210) + TX, dazomet (216) + TX, DBCP (1045) + TX, DCIP (218) + TX, diamidafos (1044) + TX, dichlofenthion (1051) + TX, dicliphos (alternative name) + TX, dimethoate (262) + TX, doramectin (alternative name) [CCN] + TX, emamectin (291) + TX, emamectin benzoate (291) + TX, eprinomectin (alternative name) [CCN] + TX, ethoprophos (312) + TX, ethylene dibromide (316) + TX, fenamiphos (326) + TX, fenpyrad (alternative name) + TX, fensulfothion (1158) + TX, fosthiazate (408) + TX, fosthietan (1196) + TX, furfural (alternative name) [CCN] + TX, GY-81 (development code) (423) + TX, heterophos [CCN] + TX, iodomethane (IUPAC name) (542) + TX, isamidofos (1230) + TX, isazofos (1231) + TX, ivermectin (alternative name) [CCN] + TX, kinetin (alternative name) (210) + TX, mecarphon (1258) + TX, metam (519) + TX, metam-potassium (alternative name) (519) + TX, metam-sodium (519) + TX, methyl bromide (537) + TX, methyl isothiocyanate (543) + TX, milbemycin oxime (alternative name) [CCN] + TX, moxidectin (alternative name) [CCN] + TX, *Myrothecium verrucaria* composition (alternative name) (565) + TX, NC-184 (compound code) + TX, oxamyl (602) + TX, phorate (636) + TX, phosphamidon (639) + TX, phosphocarb [CCN] + TX, sebufos (alternative name) + TX, selamectin (alternative name) [CCN] + TX, spinosad (737) + TX, terbam (alternative name) + TX, terbufos (773) + TX, tetrachlorothiophene (IUPAC/ Chemical Abstracts name) (1422) + TX, thiafenox (alternative name) + TX, thionazin (1434) + TX, triazophos (820) + TX, triazuron (alternative name) + TX, xylenols [CCN] + TX, YI-5302 (compound code) and zeatin (alternative name) (210) + TX, fluensulfone [318290-98-1] + TX,

a nitrification inhibitor selected from the group of substances consisting of potassium ethylxanthate [CCN] and nitrapyrin (580) + TX,

a plant activator selected from the group of substances consisting of acibenzolar (6) + TX, acibenzolar-S-methyl (6) + TX, probenazole (658) and *Reynoutria sachalinensis* extract (alternative name) (720) + TX,

a rodenticide selected from the group of substances consisting of 2-isovalerylindan-1,3-dione (IUPAC name) (1246) + TX, 4-(quinoxalin-2-ylamino)benzenesulfonamide (IUPAC name) (748) + TX, alpha-chlorohydrin [CCN] + TX, aluminium phosphide (640) + TX, antu (880) + TX, arsenous oxide (882) + TX, barium carbonate (891) + TX, bisthiosemi (912) + TX, brodifacoum (89) + TX, bromadiolone (91) + TX, bromethalin (92) + TX, calcium cyanide (444) + TX, chloralose (127) + TX, chlorophacinone (140) + TX, cholecalciferol (alternative name) (850) + TX, coumachlor (1004) + TX, coumafuryl (1005) + TX, coumatetralyl (175) + TX, crimidine (1009) + TX, difenacoum (246) + TX, difethialone (249) + TX, diphacinone (273) + TX, ergocalciferol (301) + TX, flocoumafen (357) + TX, fluoroacetamide (379) + TX, flupropadine (1183) + TX, flupropadine hydrochloride (1183) + TX, gamma-HCH (430) + TX, HCH (430) + TX, hydrogen cyanide (444) + TX, iodomethane (IUPAC name) (542) + TX, lindane (430) + TX, magnesium phosphide (IUPAC name) (640) + TX, methyl bromide (537) + TX, norbormide (1318) + TX, phosacetim (1336) + TX, phosphine (IUPAC name) (640) + TX, phosphorus [CCN] + TX, pindone (1341) + TX, potassium arsenite [CCN] + TX, pyrinuron (1371) + TX, scilliroside (1390) + TX, sodium arsenite [CCN] + TX, sodium cyanide (444) + TX, sodium fluoroacetate (735) + TX, strychnine (745) + TX, thallium sulfate [CCN] + TX, warfarin (851) and zinc phosphide (640) + TX,

a synergist selected from the group of substances consisting of 2-(2-butoxyethoxy)ethyl piperonylate (IUPAC name) (934) + TX, 5-(1,3-benzodioxol-5-yl)-3-hexylcyclohex-2-enone (IUPAC name) (903) + TX, farnesol with nerolidol (alternative name) (324) + TX, MB-599 (development code) (498) + TX, MGK 264 (development code) (296) + TX, piperonyl butoxide (649) + TX, piprotal (1343) + TX, propyl isomer (1358) + TX, S421 (development code) (724) + TX, sesamex (1393) + TX, sesasmolin (1394) and sulfoxide (1406) + TX,

an animal repellent selected from the group of substances consisting of anthraquinone (32) + TX, chloralose (127) + TX, copper naphthenate [CCN] + TX, copper oxychloride (171) + TX, diazinon (227) + TX, dicyclopentadiene (chemical name) (1069) + TX, guazatine (422) + TX, guazatine acetates (422) + TX, methiocarb (530) + TX, pyridin-4-amine (IUPAC name) (23) + TX, thiram (804) + TX, trimethacarb (840) + TX, zinc naphthenate [CCN] and ziram (856) + TX,

a virucide selected from the group of substances consisting of imanin (alternative name) [CCN] and ribavirin (alternative name) [CCN] + TX,

a wound protectant selected from the group of substances consisting of mercuric oxide (512) + TX, octhilinone (590) and thiophanate-methyl (802) + TX,

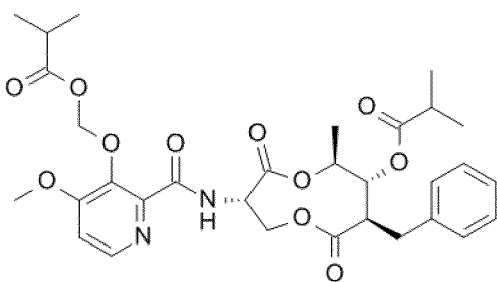
and biologically active compounds selected from the group consisting of ametocetradin [865318-97-4] + TX, amisulbrom [348635-87-0] + TX, azaconazole [60207-31-0] + TX, benzovindiflupyr [1072957-71-1] + TX, bitertanol [70585-36-3] + TX, bixafen [581809-46-3] + TX, bromuconazole [116255-48-2] + TX, coumoxystrobin [850881-70-8] + TX, cyproconazole [94361-06-5] + TX, difenoconazole [119446-68-3] + TX, diniconazole [83657-24-3] + TX, enoxastrobin [238410-11-2] + TX, epoxiconazole [106325-08-0] + TX, fenbuconazole [114369-43-6] + TX, fenpyrazamine [473798-59-3] + TX, fluquinconazole [136426-54-5] + TX, flusilazole [85509-19-9] + TX, flutriafol [76674-21-0] + TX, fluxapyroxad [907204-31-3] + TX, fluopyram [658066-35-4] + TX, fenaminstrobin [366815-39-6] + TX, isofetamid [875915-78-9] + TX, hexaconazole [79983-71-4] + TX, imazalil [35554-44-0] + TX, imibenconazole [86598-92-7] + TX, ipconazole [125225-28-7] + TX, ipfentrifluconazole [1417782-08-1] + TX, isotianil [224049-04-1] + TX, mandestrobin [173662-97-0] (can be prepared according to the procedures described in WO 2010/093059) + TX, mefentrifluconazole [1417782-03-6] + TX, metconazole [125116-23-6] + TX, myclobutanil [88671-89-0] + TX, paclobutrazol [76738-62-0] + TX, pefurazoate [101903-30-4] + TX, penflufen [494793-67-8] + TX, penconazole [66246-88-6] + TX, prothioconazole [178928-70-6] + TX, pyrifenox [88283-41-4] + TX, prochloraz [67747-09-5] + TX, propiconazole [60207-90-1] + TX, simeconazole [149508-90-7] + TX, tebuconazole [107534-96-3] + TX, tetraconazole [112281-77-3] + TX, triadimefon [43121-43-3] + TX, triadimenol [55219-65-3] + TX, triflumizole [99387-89-0] + TX, triticonazole [131983-72-7] + TX, ancymidol [12771-68-5] + TX, fenarimol [60168-88-9] + TX, nuarimol [63284-71-9] + TX, bupirimate [41483-43-6] + TX, dimethirimol [5221-53-4] + TX, ethirimol [23947-60-6] + TX, dodemorph [1593-77-7] + TX, fenpropidin [67306-00-7] + TX, fenpropimorph [67564-91-4] + TX, spiroxamine [118134-30-8] + TX, tridemorph [81412-43-3] + TX, cyprodinil [121552-61-2] + TX, mepanipyrim [110235-47-7] + TX, pyrimethanil [53112-28-0] + TX, fempiclonil [74738-17-3] + TX, fludioxonil [131341-86-1] + TX, fluindapyr [1383809-87-7] + TX, benalaxyl [71626-11-4] + TX, furalaxyl [57646-30-7] + TX, metalaxyl [57837-19-1] + TX, R-metalaxyl [70630-17-0] + TX, ofurace [58810-48-3] + TX, oxadixyl [77732-09-3] + TX, benomyl [17804-35-2] + TX, carbendazim [10605-21-7] + TX,

debacarb [62732-91-6] + TX, fuberidazole [3878-19-1] + TX, thiabendazole [148-79-8] + TX, chlozolate [84332-86-5] + TX, dichlozoline [24201-58-9] + TX, iprodione [36734-19-7] + TX, myclozoline [54864-61-8] + TX, procymidone [32809-16-8] + TX, vinclozoline [50471-44-8] + TX, boscalid [188425-85-6] + TX, carboxin [5234-68-4] + TX, fenfuram [24691-80-3] + TX, flutolanil [66332-96-5] + TX, flutianil [958647-10-4] + TX, mepronil [55814-41-0] + TX, oxycarboxin [5259-88-1] + TX, penthiopyrad [183675-82-3] + TX, thifluzamide [130000-40-7] + TX, guazatine [108173-90-6] + TX, dodine [2439-10-3] [112-65-2] (free base) + TX, iminoctadine [13516-27-3] + TX, azoxystrobin [131860-33-8] + TX, dimoxystrobin [149961-52-4] + TX, enestroburin {Proc. BCPC, Int. Congr., Glasgow, 2003, 1, 93} + TX, fluoxastrobin [361377-29-9] + TX, kresoxim-methyl [143390-89-0] + TX, metominostrobin [133408-50-1] + TX, trifloxystrobin [141517-21-7] + TX, orysastrobin [248593-16-0] + TX, picoxystrobin [117428-22-5] + TX, pyraclostrobin [175013-18-0] + TX, pyraoxystrobin [862588-11-2] + TX, ferbam [14484-64-1] + TX, mancozeb [8018-01-7] + TX, maneb [12427-38-2] + TX, metiram [9006-42-2] + TX, propineb [12071-83-9] + TX, thiram [137-26-8] + TX, zineb [12122-67-7] + TX, ziram [137-30-4] + TX, captafol [2425-06-1] + TX, captan [133-06-2] + TX, dichlofluanid [1085-98-9] + TX, fluoroimide [41205-21-4] + TX, folpet [133-07-3] + TX, tolylfluanid [731-27-1] + TX, bordeaux mixture [8011-63-0] + TX, copperhydroxid [20427-59-2] + TX, copperoxychlorid [1332-40-7] + TX, coppersulfat [7758-98-7] + TX, copperoxid [1317-39-1] + TX, mancopper [53988-93-5] + TX, oxine-copper [10380-28-6] + TX, dinocap [131-72-6] + TX, nitrothal-isopropyl [10552-74-6] + TX, edifenphos [17109-49-8] + TX, iprobenphos [26087-47-8] + TX, isoprothiolane [50512-35-1] + TX, phosdiphen [36519-00-3] + TX, pyrazophos [13457-18-6] + TX, tolclofos-methyl [57018-04-9] + TX, acibenzolar-S-methyl [135158-54-2] + TX, anilazine [101-05-3] + TX, benthialdicarb [413615-35-7] + TX, blasticidin-S [2079-00-7] + TX, chinomethionat [2439-01-2] + TX, chloroneb [2675-77-6] + TX, chlorothalonil [1897-45-6] + TX, cyflufenamid [180409-60-3] + TX, cymoxanil [57966-95-7] + TX, dichlone [117-80-6] + TX, diclocymet [139920-32-4] + TX, diclomezine [62865-36-5] + TX, dicloran [99-30-9] + TX, diethofencarb [87130-20-9] + TX, dimethomorph [110488-70-5] + TX, SYP-LI90 (Flumorph) [211867-47-9] + TX, dithianon [3347-22-6] + TX, ethaboxam [162650-77-3] + TX, etridiazole [2593-15-9] + TX, famoxadone [131807-57-3] + TX, fenamidone [161326-34-7] + TX, fenoxanil [115852-48-7] + TX, fentin [668-34-8] + TX, ferimzone [89269-64-7] + TX, fluazinam [79622-59-6] + TX, fluopicolide [239110-15-7] + TX, flusulfamide [106917-52-6] + TX, fenhexamid [126833-17-8] + TX, fosetyl-aluminium [39148-24-8] + TX, hymexazol [10004-44-1] + TX, iprovalicarb [140923-17-7] + TX, IKF-916 (Cyazofamid) [120116-88-3] + TX, kasugamycin [6980-18-3] + TX, methasulfocarb [66952-49-6] + TX, metrafenone [220899-03-6] + TX, pencycuron [66063-05-6] + TX, phthalide [27355-22-2] + TX, picarbutrazox [500207-04-5] + TX, polyoxins [11113-80-7] + TX, probenazole [27605-76-1] + TX, propamocarb [25606-41-1] + TX, proquinazid [189278-12-4] + TX, pydiflumetofen [1228284-64-7] + TX, pyrametostrobin [915410-70-7] + TX, pyroquilon [57369-32-1] + TX, pyriofenone [688046-61-9] + TX, pyribencarb [799247-52-2] + TX, pyrisoxazole [847749-37-5] + TX, quinoxifen [124495-18-7] + TX, quintozone [82-68-8] + TX, sulfur [7704-34-9] + TX, Timorex Gold™ (plant extract containing tea tree oil from the Stockton Group) + TX, tebufloquin [376645-78-2] + TX, tiadinil [223580-51-6] + TX, triazoxide [72459-58-6] + TX, tolprocarb [911499-62-2] + TX, triclopyricarb [902760-40-1] + TX, tricyclazole [41814-78-2] + TX, triforine [26644-46-2] + TX, validamycin [37248-47-8] + TX, valifenalate [283159-90-0] + TX, zoxamide (RH7281) [156052-68-5] +

TX, mandipropamid [374726-62-2] + TX, isopyrazam [881685-58-1] + TX, phenamacril + TX, sedaxane [874967-67-6] + TX, trinexapac-ethyl [95266-40-3] + TX, 3-difluoromethyl-1-methyl-1H-pyrazole-4-carboxylic acid (9-dichloromethylene-1,2,3,4-tetrahydro-1,4-methano-naphthalen-5-yl)-amide (disclosed in WO 2007/048556) + TX, 3-difluoromethyl-1-methyl-1H-pyrazole-4-carboxylic acid (3',4',5'-trifluorobiphenyl-2-yl)-amide (disclosed in WO 2006/087343) + TX, [(3*S*,4*R*,4*aR*,6*S*,6*aS*,12*R*,12*aS*,12*bS*)-3-[(cyclopropylcarbonyl)oxy]-1,3,4,4*a*,5,6,6*a*,12,12*a*,12*b*-decahydro-6,12-dihydroxy-4,6*a*,12*b*-trimethyl-11-oxo-9-(3-pyridinyl)-2*H*,11*H*naphtho[2,1-*b*]pyrano[3,4-*e*]pyran-4-yl)methyl-cyclopropanecarboxylate [915972-17-7] + TX and 1,3,5-trimethyl-N-(2-methyl-1-oxopropyl)-N-[3-(2-methylpropyl)-4-[2,2,2-trifluoro-1-methoxy-1-(trifluoromethyl)ethyl]phenyl]-1H-pyrazole-4-carboxamide [926914-55-8] + TX,

10 or a biologically active compound selected from the group consisting of N-[(5-chloro-2-isopropyl-phenyl)methyl]-N-cyclopropyl-3-(difluoromethyl)-5-fluoro-1-methyl-pyrazole-4-carboxamide (can be prepared according to the procedures described in WO 2010/130767) + TX, 2,6-Dimethyl-1*H*,5*H*-[1,4]dithiino[2,3-*c*:5,6-*c'*]dipyrrole-1,3,5,7(2*H*,6*H*)-tetrone (can be prepared according to the procedures described in WO 2011/138281) + TX, 6-ethyl-5,7-dioxo-pyrrolo[4,5][1,4]dithiino[1,2-*c*]isothiazole-3-carbonitrile + TX, 4-(2-bromo-4-fluoro-phenyl)-N-(2-chloro-6-fluoro-phenyl)-2,5-dimethyl-pyrazol-3-amine (can be prepared according to the procedures described in WO 2012/031061) + TX, 3-(difluoromethyl)-N-(7-fluoro-1,1,3-trimethyl-indan-4-yl)-1-methyl-pyrazole-4-carboxamide (can be prepared according to the procedures described in WO 2012/084812) + TX, CAS 850881-30-0 + TX, 3-(3,4-dichloro-1,2-thiazol-5-ylmethoxy)-1,2-benzothiazole 1,1-dioxide (can be prepared according to the procedures described in WO 2007/129454) + TX, 2-[2-[(2,5-dimethylphenoxy)methyl]phenyl]-2-methoxy-N-methyl-acetamide + TX, 3-(4,4-difluoro-3,4-dihydro-3,3-dimethylisoquinolin-1-yl)quinolone (can be prepared according to the procedures described in WO 2005/070917) + TX, 2-[2-fluoro-6-[(8-fluoro-2-methyl-3-quinolyl)oxy]phenyl]propan-2-ol (can be prepared according to the procedures described in WO 2011/081174) + TX, 2-[2-[(7,8-difluoro-2-methyl-3-quinolyl)oxy]-6-fluoro-phenyl]propan-2-ol (can be prepared according to the procedures described in WO 2011/081174) + TX, oxathiapiprolin + TX [1003318-67-9], tert-butyl N-[6-[[[(1-methyltetrazol-5-yl)-phenyl-methylene]amino]oxymethyl]-2-pyridyl]carbamate + TX, N-[2-(3,4-difluorophenyl)phenyl]-3-(trifluoromethyl)pyrazine-2-carboxamide (can be prepared according to the procedures described in WO 2007/ 072999) + TX, 3-(difluoromethyl)-1-methyl-N-[(3*R*)-1,1,3-trimethylindan-4-yl]pyrazole-4-carboxamide (can be prepared according to the procedures described in WO 2014/013842) + TX, 2,2,2-trifluoroethyl N-[2-methyl-1-[(4-methylbenzoyl)amino]methyl]propyl]carbamate + TX, (2*RS*)-2-[4-(4-chlorophenoxy)- α,α,α -trifluoro-o-tolyl]-1-(1*H*-1,2,4-triazol-1-yl)propan-2-ol + TX, (2*RS*)-2-[4-(4-chlorophenoxy)- α,α,α -trifluoro-o-tolyl]-3-methyl-1-(1*H*-1,2,4-triazol-1-yl)butan-2-ol + TX, 2-(difluoromethyl)-N-[(3*R*)-3-ethyl-1,1-dimethyl-indan-4-yl]pyridine-3-carboxamide + TX, 2-(difluoromethyl)-N-[3-ethyl-1,1-dimethyl-indan-4-yl]pyridine-3-carboxamide + TX, N'-(2,5-dimethyl-4-phenoxy-phenyl)-N-ethyl-N-methyl-formamidine + TX, N'-[4-(4,5-dichlorothiazol-2-yl)oxy-2,5-dimethyl-phenyl]-N-ethyl-N-methyl-formamidine (can be prepared according to the procedures described in WO 2007/031513) + TX, [2-[3-[2-[1-[2-[3,5-bis(difluoromethyl)pyrazol-1-yl]acetyl]-4-piperidyl]thiazol-4-yl]-4,5-dihydroisoxazol-5-yl]-3-chloro-phenyl] methanesulfonate (can be prepared according to the procedures described in WO

2012/025557) + TX, but-3-ynyl N-[6-[(Z)-[(1-methyltetrazol-5-yl)-phenyl-methylene]amino]oxymethyl]-2-pyridyl]carbamate (can be prepared according to the procedures described in WO 2010/000841) + TX, 2-[[3-(2-chlorophenyl)-2-(2,4-difluorophenyl)oxiran-2-yl]methyl]-4H-1,2,4-triazole-3-thione (can be prepared according to the procedures described in WO 2010/146031) + TX, methyl N-[[5-[4-(2,4-dimethylphenyl)triazol-2-yl]-2-methyl-phenyl]methyl]carbamate + TX, 3-chloro-6-methyl-5-phenyl-4-(2,4,6-trifluorophenyl)pyridazine (can be prepared according to the procedures described in WO 2005/121104) + TX, 2-[2-chloro-4-(4-chlorophenoxy)phenyl]-1-(1,2,4-triazol-1-yl)propan-2-ol (can be prepared according to the procedures described in WO 2013/024082) + TX, 3-chloro-4-(2,6-difluorophenyl)-6-methyl-5-phenyl-pyridazine (can be prepared according to the procedures described in WO 2012/020774) + TX, 4-(2,6-difluorophenyl)-6-methyl-5-phenyl-pyridazine-3-carbonitrile (can be prepared according to the procedures described in WO 2012/020774) + TX, (R)-3-(difluoromethyl)-1-methyl-N-[1,1,3-trimethylindan-4-yl]pyrazole-4-carboxamide (can be prepared according to the procedures described in WO 2011/162397) + TX, 3-(difluoromethyl)-N-(7-fluoro-1,1,3-trimethyl-indan-4-yl)-1-methyl-pyrazole-4-carboxamide (can be prepared according to the procedures described in WO 2012/084812) + TX, 1-[2-[[1-(4-chlorophenyl)pyrazol-3-yl]oxymethyl]-3-methyl-phenyl]-4-methyl-tetrazol-5-one (can be prepared according to the procedures described in WO 2013/162072) + TX, 1-methyl-4-[3-methyl-2-[[2-methyl-4-(3,4,5-trimethylpyrazol-1-yl)phenoxy]methyl]phenyl]tetrazol-5-one (can be prepared according to the procedures described in WO 2014/051165) + TX, (Z,2E)-5-[1-(4-chlorophenyl)pyrazol-3-yl]oxy-2-methoxyimino-N,3-dimethyl-pent-3-enamide + TX, (4-phenoxyphenyl)methyl 2-amino-6-methyl-pyridine-3-carboxylate + TX, N-(5-chloro-2-isopropylbenzyl)-N-cyclopropyl-3-(difluoromethyl)-5-fluoro-1-methylpyrazole-4-carboxamide [1255734-28-1] (can be prepared according to the procedures described in WO 2010/130767) + TX, 3-(difluoromethyl)-N-[(R)-2,3-dihydro-1,1,3-trimethyl-1H-inden-4-yl]-1-methylpyrazole-4-carboxamide [1352994-67-2] + TX, N'-(2,5-dimethyl-4-phenoxy-phenyl)-N-ethyl-N-methyl-formamidine + TX, N'-[4-(4,5-dichloro-thiazol-2-yloxy)-2,5-dimethyl-phenyl]-N-ethyl-N-methyl-formamidine + TX, N'-(2,5-dimethyl-4-phenoxy-phenyl)-N-ethyl-N-methyl-formamidine + TX, N'-[4-(4,5-dichloro-thiazol-2-yloxy)-2,5-dimethyl-phenyl]-N-ethyl-N-methyl-formamidine + TX,



(fencicoxamid [517875-34-2] (as described in WO

2003/035617)) + TX, (1S)-2,2-bis(4-fluorophenyl)-1-methylethyl N-[[3-(acetyloxy)-4-methoxy-2-pyridyl]carbonyl]-L-alaninate [1961312-55-9] (as described in WO 2016/122802) + TX, 2-(difluoromethyl)-N-(1,1,3-trimethylindan-4-yl)pyridine-3-carboxamide + TX, 2-(difluoromethyl)-N-(3-ethyl-1,1-dimethyl-indan-4-yl)pyridine-3-carboxamide + TX, 2-(difluoromethyl)-N-(1,1-dimethyl-3-propyl-indan-4-yl)pyridine-3-carboxamide + TX, 2-(difluoromethyl)-N-(3-isobutyl-1,1-dimethyl-indan-4-yl)pyridine-3-carboxamide + TX, 2-(difluoromethyl)-N-[(3R)-1,1,3-trimethylindan-4-yl]pyridine-3-

carboxamide + TX, 2-(difluoromethyl)-N-[(3R)-3-ethyl-1,1-dimethyl-indan-4-yl]pyridine-3-carboxamide + TX, and 2-(difluoromethyl)-N-[(3R)-1,1-dimethyl-3-propyl-indan-4-yl]pyridine-3-carboxamide + TX, wherein each of these carboxamide compounds can be prepared according to the procedures described in WO 2014/095675 and/or WO 2016/139189.

5

The references in brackets behind the active ingredients, e.g. [3878-19-1] refer to the Chemical Abstracts Registry number. The above described mixing partners are known. Where the active ingredients are included in "The Pesticide Manual" [The Pesticide Manual - A World Compendium; Thirteenth Edition; Editor: C. D. S. Tomlin; The British Crop Protection Council], they are described therein under the entry number given in round brackets hereinabove for the particular compound; for example, the compound "abamectin" is described under entry number (1). Where "[CCN]" is added hereinabove to the particular compound, the compound in question is included in the "Compendium of Pesticide Common Names", which is accessible on the internet [A. Wood; Compendium of Pesticide Common Names, Copyright © 1995-2004]; for example, the compound "acetoprole" is described under the internet address <http://www.alanwood.net/pesticides/acetoprole.html>.

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Most of the active ingredients described above are referred to hereinabove by a so-called "common name", the relevant "ISO common name" or another "common name" being used in individual cases. If the designation is not a "common name", the nature of the designation used instead is given in round brackets for the particular compound; in that case, the IUPAC name, the IUPAC/Chemical Abstracts name, a "chemical name", a "traditional name", a "compound name" or a "development code" is used or, if neither one of those designations nor a "common name" is used, an "alternative name" is employed. "CAS Reg. No" means the Chemical Abstracts Registry Number.

20

The active ingredient mixture of the compounds of formula (I) selected from one compound as represented in Tables 1.1 to 1.3 and Tables 2.1 and 2.2 (below), or the compounds 1.1 to 1.190 described in Table T1 (below), is preferably in a mixing ratio of from 100:1 to 1:6000, especially from 50:1 to 1:50, more especially in a ratio of from 20:1 to 1:20, even more especially from 10:1 to 1:10, very especially from 5:1 and 1:5, special preference being given to a ratio of from 2:1 to 1:2, and a ratio of from 4:1 to 2:1 being likewise preferred, above all in a ratio of 1:1, or 5:1, or 5:2, or 5:3, or 5:4, or 4:1, or 4:2, or 4:3, or 3:1, or 3:2, or 2:1, or 1:5, or 2:5, or 3:5, or 4:5, or 1:4, or 2:4, or 3:4, or 1:3, or 2:3, or 1:2, or 1:600, or 1:300, or 1:150, or 1:35, or 2:35, or 4:35, or 1:75, or 2:75, or 4:75, or 1:6000, or 1:3000, or 1:1500, or 1:350, or 2:350, or 4:350, or 1:750, or 2:750, or 4:750. Those mixing ratios are by weight.

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The mixtures as described above can be used in a method for controlling pests, which comprises applying a composition comprising a mixture as described above to the pests or their environment, with the exception of a method for treatment of the human or animal body by surgery or therapy and diagnostic methods practised on the human or animal body.

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The mixtures comprising a compound as represented in Tables 1.1 to 1.3 and Tables 2.1 and 2.2 (below), or the compounds 1.1 to 1.190 described in Table T1 (below), and one or more active ingredients as described above can be applied, for example, in a single "ready-mix" form, in a combined spray mixture composed from separate formulations of the single active ingredient components, such as a "tank-mix", and in a combined use of the single active ingredients when applied in a sequential

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manner, i.e. one after the other with a reasonably short period, such as a few hours or days. The order of applying a compound as represented in in Tables 1.1 to 1.3 and Tales 2.1 and 2.2 (below), or the compounds 1.1 to 1.190 described in Table T1 (below), and the active ingredient(s) as described above, is not essential for working the present invention.

5 The compositions according to the invention can also comprise further solid or liquid auxiliaries, such as stabilizers, for example unepoxidized or epoxidized vegetable oils (for example epoxidized coconut oil, rapeseed oil or soya oil), antifoams, for example silicone oil, preservatives, viscosity regulators, binders and/or tackifiers, fertilizers or other active ingredients for achieving specific effects, for example bactericides, fungicides, nematocides, plant activators, molluscicides or herbicides.

10 The compositions according to the invention are prepared in a manner known per se, in the absence of auxiliaries for example by grinding, screening and/or compressing a solid active ingredient and in the presence of at least one auxiliary for example by intimately mixing and/or grinding the active ingredient with the auxiliary (auxiliaries). These processes for the preparation of the compositions and the use of the compounds (I) for the preparation of these compositions are also a subject of the
15 invention.

 Another aspect of the invention is related to the use of a compound of Formula (I) or of a preferred individual compound as defined herein, of a composition comprising at least one compound of Formula (I) or at least one preferred individual compound as above-defined, or of a fungicidal or
20 insecticidal mixture comprising at least one compound of Formula (I) or at least one preferred individual compound as above-defined, in admixture with other fungicides or insecticides as described above, for controlling or preventing infestation of plants, e.g. useful plants such as crop plants, propagation material thereof, e.g. seeds, harvested crops, e.g. harvested food crops, or non-living materials by insects or by phytopathogenic microorganisms, preferably fungal organisms.

25 A further aspect of the invention is related to a method of controlling or preventing an infestation of plants, e.g., useful plants such as crop plants, propagation material thereof, e.g. seeds, harvested crops, e.g., harvested food crops, or of non-living materials by insects or by phytopathogenic or spoilage microorganisms or organisms potentially harmful to man, especially fungal organisms, which comprises the application of a compound of Formula (I) or of a preferred individual compound as above-defined
30 as active ingredient to the plants, to parts of the plants or to the locus thereof, to the propagation material thereof, or to any part of the non-living materials.

 Controlling or preventing means reducing infestation by phytopathogenic or spoilage microorganisms or organisms potentially harmful to man, especially fungal organisms, to such a level that an improvement is demonstrated.

35 A preferred method of controlling or preventing an infestation of crop plants by phytopathogenic microorganisms, especially fungal organisms, or insects which comprises the application of a compound of Formula (I), or an agrochemical composition which contains at least one of said compounds, is foliar application. The frequency of application and the rate of application will depend on the risk of infestation by the corresponding pathogen or insect. However, the compounds of Formula (I)
40 can also penetrate the plant through the roots *via* the soil (systemic action) by drenching the locus of

the plant with a liquid Formulation, or by applying the compounds in solid form to the soil, e.g. in granular form (soil application). In crops of water rice such granulates can be applied to the flooded rice field. The compounds of Formula (I) may also be applied to seeds (coating) by impregnating the seeds or tubers either with a liquid formulation of the fungicide or coating them with a solid formulation.

5 A formulation, e.g. a composition containing the compound of Formula (I), and, if desired, a solid or liquid adjuvant or monomers for encapsulating the compound of Formula (I), may be prepared in a known manner, typically by intimately mixing and/or grinding the compound with extenders, for example solvents, solid carriers and, optionally, surface active compounds (surfactants).

Advantageous rates of application are normally from 5g to 2kg of active ingredient (a.i.) per
10 hectare (ha), preferably from 10g to 1kg a.i./ha, most preferably from 20g to 600g a.i./ha. When used as seed drenching agent, convenient dosages are from 10mg to 1g of active substance per kg of seeds.

When the combinations of the present invention are used for treating seed, rates of 0.001 to 50 g of a compound of Formula (I) per kg of seed, preferably from 0.01 to 10g per kg of seed are generally sufficient.

15 Suitably, a composition comprising a compound of Formula (I) according to the present invention is applied either preventative, meaning prior to disease development or curative, meaning after disease development.

The compositions of the invention may be employed in any conventional form, for example in the form of a twin pack, a powder for dry seed treatment (DS), an emulsion for seed treatment (ES), a
20 flowable concentrate for seed treatment (FS), a solution for seed treatment (LS), a water dispersible powder for seed treatment (WS), a capsule suspension for seed treatment (CF), a gel for seed treatment (GF), an emulsion concentrate (EC), a suspension concentrate (SC), a suspo-emulsion (SE), a capsule suspension (CS), a water dispersible granule (WG), an emulsifiable granule (EG), an emulsion, water in oil (EO), an emulsion, oil in water (EW), a micro-emulsion (ME), an oil dispersion (OD), an oil miscible
25 flowable (OF), an oil miscible liquid (OL), a soluble concentrate (SL), an ultra-low volume suspension (SU), an ultra-low volume liquid (UL), a technical concentrate (TK), a dispersible concentrate (DC), a wettable powder (WP) or any technically feasible formulation in combination with agriculturally acceptable adjuvants.

Such compositions may be produced in conventional manner, e.g. by mixing the active ingre-
30 dients with appropriate formulation inerts (diluent, solvents, fillers and optionally other formulating ingredients such as surfactants, biocides, anti-freeze, stickers, thickeners and compounds that provide adjuvancy effects). Also conventional slow release formulations may be employed where long lasting efficacy is intended. Particularly, formulations to be applied in spraying forms, such as water dispersible concentrates (e.g. EC, SC, DC, OD, SE, EW, EO and the like), wettable powders and granules, may
35 contain surfactants such as wetting and dispersing agents and other compounds that provide adjuvancy effects, e.g. the condensation product of formaldehyde with naphthalene sulphonate, an alkylarylsulphonate, a lignin sulphonate, a fatty alkyl sulphate, and ethoxylated alkylphenol and an ethoxylated fatty alcohol.

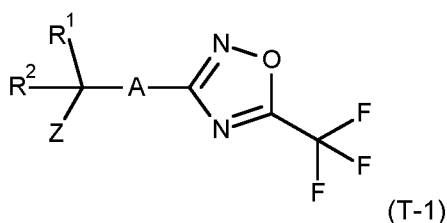
A seed dressing formulation is applied in a manner known per se to the seeds employing the
40 combination of the invention and a diluent in suitable seed dressing formulation form, e.g. as an

aqueous suspension or in a dry powder form having good adherence to the seeds. Such seed dressing formulations are known in the art. Seed dressing formulations may contain the single active ingredients or the combination of active ingredients in encapsulated form, e.g. as slow release capsules or microcapsules.

5 In general, the formulations include from 0.01 to 90% by weight of active agent, from 0 to 20% agriculturally acceptable surfactant and 10 to 99.99% solid or liquid formulation inerts and adjuvant(s), the active agent consisting of at least the compound of Formula (I) optionally together with other active agents, particularly microbiocides or conservatives or the like. Concentrated forms of compositions generally contain in between about 2 and 80%, preferably between about 5 and 70% by weight of active agent. Application forms of formulation may for example contain from 0.01 to 20% by weight, preferably from 0.01 to 5% by weight of active agent. Whereas commercial products will preferably be formulated as concentrates, the end user will normally employ diluted formulations.

Whereas it is preferred to formulate commercial products as concentrates, the end user will normally use dilute formulations.

15 Table 1.1: This table discloses 65 specific compounds of the formula (T-1):



wherein A is 2,5-thienyl and R¹ and R², are hydrogen, and Z is as defined below in the Table 1.

20 Each of Tables 1.2 to 1.3 (which follow Table 1.1) make available 65 individual compounds of the formula (T-1) in which A, R¹, and R² are as specifically defined in Tables 1.2 to 1.3, which refer to Table 1 wherein Z is specifically defined.

Table 1

Compound no.	Z	Compound no.	Z
1.001	1H-pyrazole-4-carboxylic acid	1.034	4-fluoropyrazol-1-yl
1.002	methyl 1H-pyrazole-4-carboxylate	1.035	1H-pyrazole-4-carbonitrile
1.003	ethyl 1H-pyrazole-4-carboxylate	1.036	5-(2-bromophenyl)tetrazol-1-yl
1.004	propyl 1H-pyrazole-4-carboxylate	1.037	4-nitropyrazol-1-yl
1.005	prop-2-enyl 1H-pyrazole-4-carboxylate	1.038	pyrrolo[2,3-b]pyridin-1-yl
1.006	prop-2-ynyl 1H-pyrazole-4-carboxylate	1.039	pyrazol-1-yl

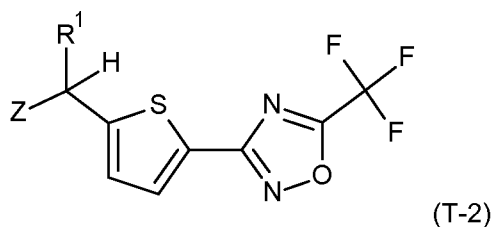
1.007	tert-butyl 1H-pyrazole-4-carboxylate	1.040	methyl 1H-1,2,4-triazole-3-carboxylate
1.008	isopropyl 1H-pyrazole-4-carboxylate	1.041	4-methylpyrazol-1-yl
1.009	2-(dimethylamino)ethyl 1H-pyrazole-4-carboxylate	1.042	1,2,3-triazol-1-yl
1.010	2-methoxyethyl 1H-pyrazole-4-carboxylate	1.043	1,2,4-triazol-1-yl
1.011	cyclopropyl 1H-pyrazole-4-carboxylate	1.044	5,5-dimethyl-isoxazolidin-3-one
1.012	cyclopropylmethyl 1H-pyrazole-4-carboxylate	1.045	N,N-dimethyl-1H-1,2,4-triazol-3-amine
1.013	1H-pyrazole-4-carboxamide	1.046	benzimidazol-1-yl
1.014	N-methyl-1H-pyrazole-4-carboxamide	1.047	5-methoxybenzimidazol-1-yl
1.015	N-ethyl-1H-pyrazole-4-carboxamide	1.048	6-methoxybenzimidazol-1-yl
1.016	N-propyl-1H-pyrazole-4-carboxamide	1.049	1H-pyrazole-4-carbaldehyde
1.017	N-isopropyl-1H-pyrazole-4-carboxamide	1.050	3,5-dimethylpyrazol-1-yl
1.018	N-prop-2-enyl-1H-pyrazole-4-carboxamide	1.051	azetidin-1-yl
1.019	N-prop-2-ynyl-1H-pyrazole-4-carboxamide	1.052	methyl 3-(methoxymethyl)-1H-pyrazole-4-carboxylate
1.020	N-cyclopropyl-1H-pyrazole-4-carboxamide	1.053	5-(difluoromethyl)-3-amino-1,2,4-triazol-2-yl
1.021	N-(cyclopropylmethyl)-1H-pyrazole-4-carboxamide	1.054	1-piperidyl
1.022	N-(2-methoxyethyl)-1H-pyrazole-4-carboxamide	1.055	morpholin-4-yl
1.023	N-methoxy-1H-pyrazole-4-carboxamide	1.056	3-oxo-morpholin-4-yl
1.024	N-ethoxy-1H-pyrazole-4-carboxamide	1.057	3-oxo-isoxazolidin-2-yl
1.025	N-prop-2-enyloxy-1H-pyrazole-4-carboxamide	1.058	5,5-dimethyl-3-oxo-isoxazolidin-2-yl
1.026	N-methoxy-N-methyl-1H-pyrazole-4-carboxamide	1.059	2-oxo-1-piperidyl
1.027	N-ethoxy-N-methyl-1H-pyrazole-4-carboxamide	1.060	3,3-dimethyl-2-oxo-1-piperidyl
1.028	N,N-dimethyl-1H-pyrazole-4-carboxamide	1.061	4,4-dimethyl-3-oxo-isoxazolidin-2-yl
1.029	N,N-diethyl-1H-pyrazole-4-carboxamide	1.062	4-methyl-2-oxo-1-pyridyl
1.030	N-ethyl-N-methyl-1H-pyrazole-4-carboxamide	1.063	2-oxo-1-pyridyl

1.031	N-prop-2-enyl-N-methyl-1H-pyrazole-4-carboxamide	1.064	1,1-dioxo-1,2-thiazolidin-2-yl
1.032	imidazol-1-yl	1.065	2-oxopyrrolidin-1-yl
1.033	5-methyl-3-aminopyrazol-2-yl		

Table 1.2: This table discloses 65 specific compounds of formula (T-1) wherein A is 3,5-thienyl and R¹ and R² are hydrogen, Z is as defined above in Table 1.

5 Table 1.3: This table discloses 65 specific compounds of formula (T-1) wherein A is 2,5-thienyl and R¹ is hydrogen, R² is methyl, and Z is as defined above in Table 1.

Table 2.1: This table discloses 372 specific compounds of the formula (T-2):



10 wherein R¹ is hydrogen and Z is as defined below in Table 2.

Table 2.2 (which follows Table 2.1) makes available 372 individual compounds of the formula (T-2) in which R¹ is as specifically defined in Table 2.2, which refers to Table 2 wherein Z is specifically defined.

15

Table 2

Compound no.	Z	Compound no.	Z
2.001	2H-pyrazole-3-carboxylic acid	2.187	1H-1,2,4-triazole-3-carboxylic acid
2.002	methyl 2H-pyrazole-3-carboxylate	2.188	methyl 1H-1,2,4-triazole-3-carboxylate
2.003	ethyl 2H-pyrazole-3-carboxylate	2.189	ethyl 1H-1,2,4-triazole-3-carboxylate
2.004	propyl 2H-pyrazole-3-carboxylate	2.190	propyl 1H-1,2,4-triazole-3-carboxylate
2.005	prop-2-enyl 2H-pyrazole-3-carboxylate	2.191	prop-2-enyl 1H-1,2,4-triazole-3-carboxylate
2.006	prop-2-ynyl 2H-pyrazole-3-carboxylate	2.192	prop-2-ynyl 1H-1,2,4-triazole-3-carboxylate
2.007	tert-butyl 2H-pyrazole-3-carboxylate	2.193	tert-butyl 1H-1,2,4-triazole-3-carboxylate
2.008	isopropyl 2H-pyrazole-3-carboxylate	2.194	isopropyl 1H-1,2,4-triazole-3-carboxylate

2.009	2-(dimethylamino)ethyl 2H-pyrazole-3-carboxylate	2.195	2-(dimethylamino)ethyl 1H-1,2,4-triazole-3-carboxylate
2.010	2-methoxyethyl 2H-pyrazole-3-carboxylate	2.196	2-methoxyethyl 1H-1,2,4-triazole-3-carboxylate
2.011	cyclopropyl 2H-pyrazole-3-carboxylate	2.197	cyclopropyl 1H-1,2,4-triazole-3-carboxylate
2.012	cyclopropylmethyl 2H-pyrazole-3-carboxylate	2.198	cyclopropylmethyl 1H-1,2,4-triazole-3-carboxylate
2.013	2H-pyrazole-3-carboxamide	2.199	1H-1,2,4-triazole-3-carboxamide
2.014	N-methyl-2H-pyrazole-3-carboxamide	2.200	N-methyl-1H-1,2,4-triazole-3-carboxamide
2.015	N-ethyl-2H-pyrazole-3-carboxamide	2.201	N-ethyl-1H-1,2,4-triazole-3-carboxamide
2.016	N-propyl-2H-pyrazole-3-carboxamide	2.202	N-propyl-1H-1,2,4-triazole-3-carboxamide
2.017	N-isopropyl-2H-pyrazole-3-carboxamide	2.203	N-isopropyl-1H-1,2,4-triazole-3-carboxamide
2.018	N-prop-2-enyl-2H-pyrazole-3-carboxamide	2.204	N-prop-2-enyl-1H-1,2,4-triazole-3-carboxamide
2.019	N-prop-2-ynyl-2H-pyrazole-3-carboxamide	2.205	N-prop-2-ynyl-1H-1,2,4-triazole-3-carboxamide
2.020	N-cyclopropyl-2H-pyrazole-3-carboxamide	2.206	N-cyclopropyl-1H-1,2,4-triazole-3-carboxamide
2.021	N-(cyclopropylmethyl)-2H-pyrazole-3-carboxamide	2.207	N-(cyclopropylmethyl)-1H-1,2,4-triazole-3-carboxamide
2.022	N-(2-methoxyethyl)-2H-pyrazole-3-carboxamide	2.208	N-(2-methoxyethyl)-1H-1,2,4-triazole-3-carboxamide
2.023	N-methoxy-2H-pyrazole-3-carboxamide	2.209	N-methoxy-1H-1,2,4-triazole-3-carboxamide
2.024	N-ethoxy-2H-pyrazole-3-carboxamide	2.210	N-ethoxy-1H-1,2,4-triazole-3-carboxamide
2.025	N-prop-2-enyloxy-2H-pyrazole-3-carboxamide	2.211	N-prop-2-enyloxy-1H-1,2,4-triazole-3-carboxamide
2.026	N-methoxy-N-methyl-2H-pyrazole-3-carboxamide	2.212	N-methoxy-N-methyl-1H-1,2,4-triazole-3-carboxamide
2.027	N-ethoxy-N-methyl-2H-pyrazole-3-carboxamide	2.213	N-ethoxy-N-methyl-1H-1,2,4-triazole-3-carboxamide
2.028	N,N-dimethyl-2H-pyrazole-3-carboxamide	2.214	N,N-dimethyl-1H-1,2,4-triazole-3-carboxamide
2.029	N,N-diethyl-2H-pyrazole-3-carboxamide	2.215	N,N-diethyl-1H-1,2,4-triazole-3-carboxamide
2.030	N-ethyl-N-methyl-2H-pyrazole-3-carboxamide	2.216	N-ethyl-N-methyl-1H-1,2,4-triazole-3-carboxamide
2.031	N-prop-2-enyl-N-methyl-2H-pyrazole-3-carboxamide	2.217	N-prop-2-enyl-N-methyl-1H-1,2,4-triazole-3-carboxamide

2.032	1H-pyrazole-3-carboxylic acid	2.218	3H-triazole-4-carboxylic acid
2.033	methyl 1H-pyrazole-3-carboxylate	2.219	methyl 3H-triazole-4-carboxylate
2.034	ethyl 1H-pyrazole-3-carboxylate	2.220	ethyl 3H-triazole-4-carboxylate
2.035	propyl 1H-pyrazole-3-carboxylate	2.221	propyl 3H-triazole-4-carboxylate
2.036	prop-2-enyl 1H-pyrazole-3-carboxylate	2.222	prop-2-enyl 3H-triazole-4-carboxylate
2.037	prop-2-ynyl 1H-pyrazole-3-carboxylate	2.223	prop-2-ynyl 3H-triazole-4-carboxylate
2.038	tert-butyl 1H-pyrazole-3-carboxylate	2.224	tert-butyl 3H-triazole-4-carboxylate
2.039	isopropyl 1H-pyrazole-3-carboxylate	2.225	isopropyl 3H-triazole-4-carboxylate
2.040	2-(dimethylamino)ethyl 1H-pyrazole-3-carboxylate	2.226	2-(dimethylamino)ethyl 3H-triazole-4-carboxylate
2.041	2-methoxyethyl 1H-pyrazole-3-carboxylate	2.227	2-methoxyethyl 3H-triazole-4-carboxylate
2.042	cyclopropyl 1H-pyrazole-3-carboxylate	2.228	cyclopropyl 3H-triazole-4-carboxylate
2.043	cyclopropylmethyl 1H-pyrazole-3-carboxylate	2.229	cyclopropylmethyl 3H-triazole-4-carboxylate
2.044	1H-pyrazole-3-carboxamide	2.230	3H-triazole-4-carboxamide
2.045	N-methyl-1H-pyrazole-3-carboxamide	2.231	N-methyl-3H-triazole-4-carboxamide
2.046	N-ethyl-1H-pyrazole-3-carboxamide	2.232	N-ethyl-3H-triazole-4-carboxamide
2.047	N-propyl-1H-pyrazole-3-carboxamide	2.233	N-propyl-3H-triazole-4-carboxamide
2.048	N-isopropyl-1H-pyrazole-3-carboxamide	2.234	N-isopropyl-3H-triazole-4-carboxamide
2.049	N-prop-2-enyl-1H-pyrazole-3-carboxamide	2.235	N-prop-2-enyl-3H-triazole-4-carboxamide
2.050	N-prop-2-ynyl-1H-pyrazole-3-carboxamide	2.236	N-prop-2-ynyl-3H-triazole-4-carboxamide
2.051	N-cyclopropyl-1H-pyrazole-3-carboxamide	2.237	N-cyclopropyl-3H-triazole-4-carboxamide
2.052	N-(cyclopropylmethyl)-1H-pyrazole-3-carboxamide	2.238	N-(cyclopropylmethyl)-3H-triazole-4-carboxamide
2.053	N-(2-methoxyethyl)-1H-pyrazole-3-carboxamide	2.239	N-(2-methoxyethyl)-3H-triazole-4-carboxamide
2.054	N-methoxy-1H-pyrazole-3-carboxamide	2.240	N-methoxy-3H-triazole-4-carboxamide
2.055	N-ethoxy-1H-pyrazole-3-carboxamide	2.241	N-ethoxy-3H-triazole-4-carboxamide

2.056	N-prop-2-enyloxy-1H-pyrazole-3-carboxamide	2.242	N-prop-2-enyloxy-3H-triazole-4-carboxamide
2.057	N-methoxy-N-methyl-1H-pyrazole-3-carboxamide	2.243	N-methoxy-N-methyl-3H-triazole-4-carboxamide
2.058	N-ethoxy-N-methyl-1H-pyrazole-3-carboxamide	2.244	N-ethoxy-N-methyl-3H-triazole-4-carboxamide
2.059	N,N-dimethyl-1H-pyrazole-3-carboxamide	2.245	N,N-dimethyl-3H-triazole-4-carboxamide
2.060	N,N-diethyl-1H-pyrazole-3-carboxamide	2.246	N,N-diethyl-3H-triazole-4-carboxamide
2.061	N-ethyl-N-methyl-1H-pyrazole-3-carboxamide	2.247	N-ethyl-N-methyl-3H-triazole-4-carboxamide
2.062	N-prop-2-enyl-N-methyl-1H-pyrazole-3-carboxamide	2.248	N-prop-2-enyl-N-methyl-3H-triazole-4-carboxamide
2.063	1H-imidazole-2-carboxylic acid	2.249	2H-triazole-4-carboxylic acid
2.064	methyl 1H-imidazole-2-carboxylate	2.250	methyl 2H-triazole-4-carboxylate
2.065	ethyl 1H-imidazole-2-carboxylate	2.251	ethyl 2H-triazole-4-carboxylate
2.066	propyl 1H-imidazole-2-carboxylate	2.252	propyl 2H-triazole-4-carboxylate
2.067	prop-2-enyl 1H-imidazole-2-carboxylate	2.253	prop-2-enyl 2H-triazole-4-carboxylate
2.068	prop-2-ynyl 1H-imidazole-2-carboxylate	2.254	prop-2-ynyl 2H-triazole-4-carboxylate
2.069	tert-butyl 1H-imidazole-2-carboxylate	2.255	tert-butyl 2H-triazole-4-carboxylate
2.070	isopropyl 1H-imidazole-2-carboxylate	2.256	isopropyl 2H-triazole-4-carboxylate
2.071	2-(dimethylamino)ethyl 1H-imidazole-2-carboxylate	2.257	2-(dimethylamino)ethyl 2H-triazole-4-carboxylate
2.072	2-methoxyethyl 1H-imidazole-2-carboxylate	2.258	2-methoxyethyl 2H-triazole-4-carboxylate
2.073	cyclopropyl 1H-imidazole-2-carboxylate	2.259	cyclopropyl 2H-triazole-4-carboxylate
2.074	cyclopropylmethyl 1H-imidazole-2-carboxylate	2.260	cyclopropylmethyl 2H-triazole-4-carboxylate
2.075	1H-imidazole-2-carboxamide	2.261	2H-triazole-4-carboxamide
2.076	N-methyl-1H-imidazole-2-carboxamide	2.262	N-methyl-2H-triazole-4-carboxamide
2.077	N-ethyl-1H-imidazole-2-carboxamide	2.263	N-ethyl-2H-triazole-4-carboxamide
2.078	N-propyl-1H-imidazole-2-carboxamide	2.264	N-propyl-2H-triazole-4-carboxamide
2.079	N-isopropyl-1H-imidazole-2-carboxamide	2.265	N-isopropyl-2H-triazole-4-carboxamide

2.080	N-prop-2-enyl-1H-imidazole-2-carboxamide	2.266	N-prop-2-enyl-2H-triazole-4-carboxamide
2.081	N-prop-2-ynyl-1H-imidazole-2-carboxamide	2.267	N-prop-2-ynyl-2H-triazole-4-carboxamide
2.082	N-cyclopropyl-1H-imidazole-2-carboxamide	2.268	N-cyclopropyl-2H-triazole-4-carboxamide
2.083	N-(cyclopropylmethyl)-1H-imidazole-2-carboxamide	2.269	N-(cyclopropylmethyl)-2H-triazole-4-carboxamide
2.084	N-(2-methoxyethyl)-1H-imidazole-2-carboxamide	2.270	N-(2-methoxyethyl)-2H-triazole-4-carboxamide
2.085	N-methoxy-1H-imidazole-2-carboxamide	2.271	N-methoxy-2H-triazole-4-carboxamide
2.086	N-ethoxy-1H-imidazole-2-carboxamide	2.272	N-ethoxy-2H-triazole-4-carboxamide
2.087	N-prop-2-enyloxy-1H-imidazole-2-carboxamide	2.273	N-prop-2-enyloxy-2H-triazole-4-carboxamide
2.088	N-methoxy-N-methyl-1H-imidazole-2-carboxamide	2.274	N-methoxy-N-methyl-2H-triazole-4-carboxamide
2.089	N-ethoxy-N-methyl-1H-imidazole-2-carboxamide	2.275	N-ethoxy-N-methyl-2H-triazole-4-carboxamide
2.090	N,N-dimethyl-1H-imidazole-2-carboxamide	2.276	N,N-dimethyl-2H-triazole-4-carboxamide
2.091	N,N-diethyl-1H-imidazole-2-carboxamide	2.277	N,N-diethyl-2H-triazole-4-carboxamide
2.092	N-ethyl-N-methyl-1H-imidazole-2-carboxamide	2.278	N-ethyl-N-methyl-2H-triazole-4-carboxamide
2.093	N-prop-2-enyl-N-methyl-1H-imidazole-2-carboxamide	2.279	N-prop-2-enyl-N-methyl-2H-triazole-4-carboxamide
2.094	1H-imidazole-4-carboxylic acid	2.280	1H-triazole-4-carboxylic acid
2.095	methyl 1H-imidazole-4-carboxylate	2.281	methyl 1H-triazole-4-carboxylate
2.096	ethyl 1H-imidazole-4-carboxylate	2.282	ethyl 1H-triazole-4-carboxylate
2.097	propyl 1H-imidazole-4-carboxylate	2.283	propyl 1H-triazole-4-carboxylate
2.098	prop-2-enyl 1H-imidazole-4-carboxylate	2.284	prop-2-enyl 1H-triazole-4-carboxylate
2.099	prop-2-ynyl 1H-imidazole-4-carboxylate	2.285	prop-2-ynyl 1H-triazole-4-carboxylate
2.100	tert-butyl 1H-imidazole-4-carboxylate	2.286	tert-butyl 1H-triazole-4-carboxylate
2.101	isopropyl 1H-imidazole-4-carboxylate	2.287	isopropyl 1H-triazole-4-carboxylate
2.102	2-(dimethylamino)ethyl 1H-imidazole-4-carboxylate	2.288	2-(dimethylamino)ethyl 1H-triazole-4-carboxylate
2.103	2-methoxyethyl 1H-imidazole-4-carboxylate	2.289	2-methoxyethyl 1H-triazole-4-carboxylate

2.104	cyclopropyl 1H-imidazole-4-carboxylate	2.290	cyclopropyl 1H-triazole-4-carboxylate
2.105	cyclopropylmethyl 1H-imidazole-4-carboxylate	2.291	cyclopropylmethyl 1H-triazole-4-carboxylate
2.106	1H-imidazole-4-carboxamide	2.292	1H-triazole-4-carboxamide
2.107	N-methyl-1H-imidazole-4-carboxamide	2.293	N-methyl-1H-triazole-4-carboxamide
2.108	N-ethyl-1H-imidazole-4-carboxamide	2.294	N-ethyl-1H-triazole-4-carboxamide
2.109	N-propyl-1H-imidazole-4-carboxamide	2.295	N-propyl-1H-triazole-4-carboxamide
2.110	N-isopropyl-1H-imidazole-4-carboxamide	2.296	N-isopropyl-1H-triazole-4-carboxamide
2.111	N-prop-2-enyl-1H-imidazole-4-carboxamide	2.297	N-prop-2-enyl-1H-triazole-4-carboxamide
2.112	N-prop-2-ynyl-1H-imidazole-4-carboxamide	2.298	N-prop-2-ynyl-1H-triazole-4-carboxamide
2.113	N-cyclopropyl-1H-imidazole-4-carboxamide	2.299	N-cyclopropyl-1H-triazole-4-carboxamide
2.114	N-(cyclopropylmethyl)-1H-imidazole-4-carboxamide	2.300	N-(cyclopropylmethyl)-1H-triazole-4-carboxamide
2.115	N-(2-methoxyethyl)-1H-imidazole-4-carboxamide	2.301	N-(2-methoxyethyl)-1H-triazole-4-carboxamide
2.116	N-methoxy-1H-imidazole-4-carboxamide	2.302	N-methoxy-1H-triazole-4-carboxamide
2.117	N-ethoxy-1H-imidazole-4-carboxamide	2.303	N-ethoxy-1H-triazole-4-carboxamide
2.118	N-prop-2-enyloxy-1H-imidazole-4-carboxamide	2.304	N-prop-2-enyloxy-1H-triazole-4-carboxamide
2.119	N-methoxy-N-methyl-1H-imidazole-4-carboxamide	2.305	N-methoxy-N-methyl-1H-triazole-4-carboxamide
2.120	N-ethoxy-N-methyl-1H-imidazole-4-carboxamide	2.306	N-ethoxy-N-methyl-1H-triazole-4-carboxamide
2.121	N,N-dimethyl-1H-imidazole-4-carboxamide	2.307	N,N-dimethyl-1H-triazole-4-carboxamide
2.122	N,N-diethyl-1H-imidazole-4-carboxamide	2.308	N,N-diethyl-1H-triazole-4-carboxamide
2.123	N-ethyl-N-methyl-1H-imidazole-4-carboxamide	2.309	N-ethyl-N-methyl-1H-triazole-4-carboxamide
2.124	N-prop-2-enyl-N-methyl-1H-imidazole-4-carboxamide	2.310	N-prop-2-enyl-N-methyl-1H-triazole-4-carboxamide
2.125	3H-imidazole-4-carboxylic acid	2.311	1H-tetrazole-5-carboxylic acid
2.126	methyl 3H-imidazole-4-carboxylate	2.312	methyl 1H-tetrazole-5-carboxylate
2.127	ethyl 3H-imidazole-4-carboxylate	2.313	ethyl 1H-tetrazole-5-carboxylate

2.128	propyl 3H-imidazole-4-carboxylate	2.314	propyl 1H-tetrazole-5-carboxylate
2.129	prop-2-enyl 3H-imidazole-4-carboxylate	2.315	prop-2-enyl 1H-tetrazole-5-carboxylate
2.130	prop-2-ynyl 3H-imidazole-4-carboxylate	2.316	prop-2-ynyl 1H-tetrazole-5-carboxylate
2.131	tert-butyl 3H-imidazole-4-carboxylate	2.317	tert-butyl 1H-tetrazole-5-carboxylate
2.132	isopropyl 3H-imidazole-4-carboxylate	2.318	isopropyl 1H-tetrazole-5-carboxylate
2.133	2-(dimethylamino)ethyl 3H-imidazole-4-carboxylate	2.319	2-(dimethylamino)ethyl 1H-tetrazole-5-carboxylate
2.134	2-methoxyethyl 3H-imidazole-4-carboxylate	2.320	2-methoxyethyl 1H-tetrazole-5-carboxylate
2.135	cyclopropyl 3H-imidazole-4-carboxylate	2.321	cyclopropyl 1H-tetrazole-5-carboxylate
2.136	cyclopropylmethyl 3H-imidazole-4-carboxylate	2.322	cyclopropylmethyl 1H-tetrazole-5-carboxylate
2.137	3H-imidazole-4-carboxamide	2.323	1H-tetrazole-5-carboxamide
2.138	N-methyl-3H-imidazole-4-carboxamide	2.324	N-methyl-1H-tetrazole-5-carboxamide
2.139	N-ethyl-3H-imidazole-4-carboxamide	2.325	N-ethyl-1H-tetrazole-5-carboxamide
2.140	N-propyl-3H-imidazole-4-carboxamide	2.326	N-propyl-1H-tetrazole-5-carboxamide
2.141	N-isopropyl-3H-imidazole-4-carboxamide	2.327	N-isopropyl-1H-tetrazole-5-carboxamide
2.142	N-prop-2-enyl-3H-imidazole-4-carboxamide	2.328	N-prop-2-enyl-1H-tetrazole-5-carboxamide
2.143	N-prop-2-ynyl-3H-imidazole-4-carboxamide	2.329	N-prop-2-ynyl-1H-tetrazole-5-carboxamide
2.144	N-cyclopropyl-3H-imidazole-4-carboxamide	2.330	N-cyclopropyl-1H-tetrazole-5-carboxamide
2.145	N-(cyclopropylmethyl)-3H-imidazole-4-carboxamide	2.331	N-(cyclopropylmethyl)-1H-tetrazole-5-carboxamide
2.146	N-(2-methoxyethyl)-3H-imidazole-4-carboxamide	2.332	N-(2-methoxyethyl)-1H-tetrazole-5-carboxamide
2.147	N-methoxy-3H-imidazole-4-carboxamide	2.333	N-methoxy-1H-tetrazole-5-carboxamide
2.148	N-ethoxy-3H-imidazole-4-carboxamide	2.334	N-ethoxy-1H-tetrazole-5-carboxamide
2.149	N-prop-2-enyloxy-3H-imidazole-4-carboxamide	2.335	N-prop-2-enyloxy-1H-tetrazole-5-carboxamide
2.150	N-methoxy-N-methyl-3H-imidazole-4-carboxamide	2.336	N-methoxy-N-methyl-1H-tetrazole-5-carboxamide

2.151	N-ethoxy-N-methyl-3H-imidazole-4-carboxamide	2.337	N-ethoxy-N-methyl-1H-tetrazole-5-carboxamide
2.152	N,N-dimethyl-3H-imidazole-4-carboxamide	2.338	N,N-dimethyl-1H-tetrazole-5-carboxamide
2.153	N,N-diethyl-3H-imidazole-4-carboxamide	2.339	N,N-diethyl-1H-tetrazole-5-carboxamide
2.154	N-ethyl-N-methyl-3H-imidazole-4-carboxamide	2.340	N-ethyl-N-methyl-1H-tetrazole-5-carboxamide
2.155	N-prop-2-enyl-N-methyl-3H-imidazole-4-carboxamide	2.341	N-prop-2-enyl-N-methyl-1H-tetrazole-5-carboxamide
2.156	2H-1,2,4-triazole-3-carboxylic acid	2.342	2H-tetrazole-5-carboxylic acid
2.157	methyl 2H-1,2,4-triazole-3-carboxylate	2.343	methyl 2H-tetrazole-5-carboxylate
2.158	ethyl 2H-1,2,4-triazole-3-carboxylate	2.344	ethyl 2H-tetrazole-5-carboxylate
2.159	propyl 2H-1,2,4-triazole-3-carboxylate	2.345	propyl 2H-tetrazole-5-carboxylate
2.160	prop-2-enyl 2H-1,2,4-triazole-3-carboxylate	2.346	prop-2-enyl 2H-tetrazole-5-carboxylate
2.161	prop-2-ynyl 2H-1,2,4-triazole-3-carboxylate	2.347	prop-2-ynyl 2H-tetrazole-5-carboxylate
2.162	tert-butyl 2H-1,2,4-triazole-3-carboxylate	2.348	tert-butyl 2H-tetrazole-5-carboxylate
2.163	isopropyl 2H-1,2,4-triazole-3-carboxylate	2.349	isopropyl 2H-tetrazole-5-carboxylate
2.164	2-(dimethylamino)ethyl 2H-1,2,4-triazole-3-carboxylate	2.350	2-(dimethylamino)ethyl 2H-tetrazole-5-carboxylate
2.165	2-methoxyethyl 2H-1,2,4-triazole-3-carboxylate	2.351	2-methoxyethyl 2H-tetrazole-5-carboxylate
2.166	cyclopropyl 2H-1,2,4-triazole-3-carboxylate	2.352	cyclopropyl 2H-tetrazole-5-carboxylate
2.167	cyclopropylmethyl 2H-1,2,4-triazole-3-carboxylate	2.353	cyclopropylmethyl 2H-tetrazole-5-carboxylate
2.168	2H-1,2,4-triazole-3-carboxamide	2.354	2H-tetrazole-5-carboxamide
2.169	N-methyl-2H-1,2,4-triazole-3-carboxamide	2.355	N-methyl-2H-tetrazole-5-carboxamide
2.170	N-ethyl-2H-1,2,4-triazole-3-carboxamide	2.356	N-ethyl-2H-tetrazole-5-carboxamide
2.171	N-propyl-2H-1,2,4-triazole-3-carboxamide	2.357	N-propyl-2H-tetrazole-5-carboxamide
2.172	N-isopropyl-2H-1,2,4-triazole-3-carboxamide	2.358	N-isopropyl-2H-tetrazole-5-carboxamide
2.173	N-prop-2-enyl-2H-1,2,4-triazole-3-carboxamide	2.359	N-prop-2-enyl-2H-tetrazole-5-carboxamide

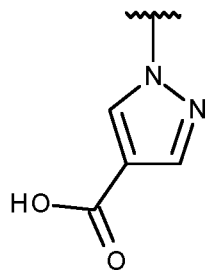
2.174	N-prop-2-ynyl-2H-1,2,4-triazole-3-carboxamide	2.360	N-prop-2-ynyl-2H-tetrazole-5-carboxamide
2.175	N-cyclopropyl-2H-1,2,4-triazole-3-carboxamide	2.361	N-cyclopropyl-2H-tetrazole-5-carboxamide
2.176	N-(cyclopropylmethyl)-2H-1,2,4-triazole-3-carboxamide	2.362	N-(cyclopropylmethyl)-2H-tetrazole-5-carboxamide
2.177	N-(2-methoxyethyl)-2H-1,2,4-triazole-3-carboxamide	2.363	N-(2-methoxyethyl)-2H-tetrazole-5-carboxamide
2.178	N-methoxy-2H-1,2,4-triazole-3-carboxamide	2.364	N-methoxy-2H-tetrazole-5-carboxamide
2.179	N-ethoxy-2H-1,2,4-triazole-3-carboxamide	2.365	N-ethoxy-2H-tetrazole-5-carboxamide
2.180	N-prop-2-enyloxy-2H-1,2,4-triazole-3-carboxamide	2.366	N-prop-2-enyloxy-2H-tetrazole-5-carboxamide
2.181	N-methoxy-N-methyl-2H-1,2,4-triazole-3-carboxamide	2.367	N-methoxy-N-methyl-2H-tetrazole-5-carboxamide
2.182	N-ethoxy-N-methyl-2H-1,2,4-triazole-3-carboxamide	2.368	N-ethoxy-N-methyl-2H-tetrazole-5-carboxamide
2.183	N,N-dimethyl-2H-1,2,4-triazole-3-carboxamide	2.369	N,N-dimethyl-2H-tetrazole-5-carboxamide
2.184	N,N-diethyl-2H-1,2,4-triazole-3-carboxamide	2.370	N,N-diethyl-2H-tetrazole-5-carboxamide
2.185	N-ethyl-N-methyl-2H-1,2,4-triazole-3-carboxamide	2.371	N-ethyl-N-methyl-2H-tetrazole-5-carboxamide
2.186	N-prop-2-enyl-N-methyl-2H-1,2,4-triazole-3-carboxamide	2.372	N-prop-2-enyl-N-methyl-2H-tetrazole-5-carboxamide

Table 2.2: This table discloses 372 specific compounds of formula (T-2) wherein R¹ is methyl and Z is as defined above in Table 2.

5 For Z as defined in Tables 1 and 2 above (with the exceptions of compound no.s 1.034, 1.036 to 1.039, 1.041 to 1.043, 1.046 to 1.048, 1.050, 1.051, 1.053 to 1.065 identified as radicals), Z groups are disclosed as a compound where the available ring nitrogen (as designated by an N-H group) is the binding point to the rest of the molecule in accordance with a Z radical for the compounds of Formula (I) of the present invention.

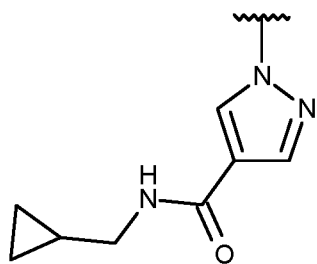
10

By way of example, the Z radical of compound 1.001 (1H-pyrazole-4-carboxylic acid) in Table 1 is:



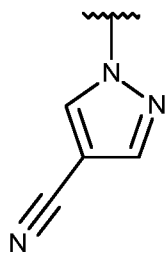
;

the Z radical of compound 1.021 (N-(cyclopropylmethyl)-1H-pyrazole-4-carboxamide) in Table 1 is:



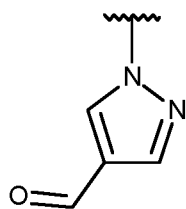
;

5 the Z radical of compound 1.035 (1H-pyrazole-4-carbonitrile) in Table 1 is:



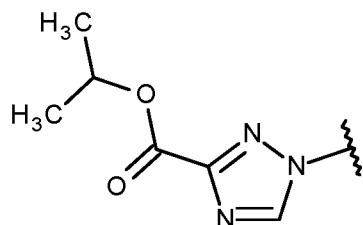
;

the Z radical of compound 1.049 (1H-pyrazole-4-carbaldehyde) in Table 1 is:



;

the Z radical of compound 2.194 (isopropyl 1H-1,2,4-triazole-3-carboxylate) in Table 2 is:



10 , and so on.

The following general procedure was used in a combinatorial fashion using appropriate building blocks (compounds of Formulas (II) and (III)) to provide the compounds of Formula (I). The compounds prepared via the following combinatorial protocol were analyzed using LC/MS Method B.

EXAMPLES

The Examples which follow serve to illustrate the invention. The compounds of the invention can be distinguished from known compounds by virtue of greater efficacy at low application rates, which can be verified by the person skilled in the art using the experimental procedures outlined in the Examples, using lower application rates if necessary, for example 50 ppm, 12.5 ppm, 6 ppm, 3 ppm, 1.5 ppm, 0.8 ppm or 0.2 ppm.

Compounds of Formula (I) may possess any number of benefits including, *inter alia*, advantageous levels of biological activity for protecting plants against diseases that are caused by fungi or superior properties for use as agrochemical active ingredients (for example, greater biological activity, an advantageous spectrum of activity, an increased safety profile (including improved crop tolerance), improved physico-chemical properties, or increased biodegradability).

Throughout this description, temperatures are given in degrees Celsius (°C) and "mp." means melting point. LC/MS means Liquid Chromatography Mass Spectrometry and the description of the apparatus and the method (Methods A, B and C) is as follows:

The description of the LC/MS apparatus and the method A is:

SQ Detector 2 from Waters

Ionisation method: Electrospray

Polarity: positive and negative ions

Capillary (kV) 3.0, Cone (V) 30.00, Extractor (V) 2.00, Source Temperature (°C) 150, Desolvation Temperature (°C) 350, Cone Gas Flow (L/Hr) 0, Desolvation Gas Flow (L/Hr) 650

Mass range: 100 to 900 Da

DAD Wavelength range (nm): 210 to 500

Method Waters ACQUITY UPLC with the following HPLC gradient conditions:

(Solvent A: Water/Methanol 20:1 + 0.05% formic acid and Solvent B: Acetonitrile+ 0.05% formic acid)

Time (minutes)	A (%)	B (%)	Flow rate (ml/min)
0	100	0	0.85
1.2	0	100	0.85
1.5	0	100	0.85

Type of column: Waters ACQUITY UPLC HSS T3; Column length: 30 mm; Internal diameter of column: 2.1 mm; Particle Size: 1.8 micron; Temperature: 60°C.

The description of the LC/MS apparatus and the method B is:

SQ Detector 2 from Waters

Ionisation method: Electrospray

Polarity: positive ions

Capillary (kV) 3.5, Cone (V) 30.00, Extractor (V) 3.00, Source Temperature (°C) 150, Desolvation Temperature (°C) 400, Cone Gas Flow (L/Hr) 60, Desolvation Gas Flow (L/Hr) 700

5 Mass range: 140 to 800 Da

DAD Wavelength range (nm): 210 to 400

Method Waters ACQUITY UPLC with the following HPLC gradient conditions:

10 (Solvent A: Water/Methanol 9:1 + 0.1% formic acid and Solvent B: Acetonitrile + 0.1% formic acid)

	Time (minutes)	A (%)	B (%)	Flow rate (ml/min)
	0	100	0	0.75
	2.5	0	100	0.75
	2.8	0	100	0.75
15	3.0	100	0	0.75

Type of column: Waters ACQUITY UPLC HSS T3; Column length: 30 mm; Internal diameter of column: 2.1 mm; Particle Size: 1.8 micron; Temperature: 60°C.

The description of the LC/MS apparatus and the method C is:

20 SQ Detector 2 from Waters

Ionisation method: Electrospray

ACQUITY H Class UPLC, Mass Spectrometer from Waters

Polarity: positive and Negative Polarity Switch

Scan Type MS1 Scan

25 Capillary (kV) 3.00, Cone (V) 40.00, Desolvation Temperature (°C) 500, Cone Gas Flow (L/Hr) 50, Desolvation Gas Flow (L/Hr) 1000

Mass range: 0 to 2000 Da

DAD Wavelength range (nm): 200 to 350

30 Method Waters ACQUITY UPLC with the following HPLC gradient conditions:

(Solvent A: Water +,0.1% formic acid and Solvent B: Acetonitrile)

	Time (minutes)	A (%)	B (%)	Flow rate (ml/min)
	0	70	30	0.5
35	0.05	70	30	0.5
	0.8	5	95	0.5
	1.8	5	95	0.5
	2.45	70	30	0.5
	2.50	70	30	0.5

Type of column: Waters ACQUITY UPLC BEH C18; Column length: 50 mm; Internal diameter of column: 2.1 mm; Particle Size: 1.7 micron; Temperature: 35°C.

Where necessary, enantiomerically pure final compounds may be obtained from racemic materials as appropriate via standard physical separation techniques, such as reverse phase chiral chromatography, or through stereoselective synthetic techniques, e.g., by using chiral starting materials.

Formulation Examples

Wettable powders

	a)	b)	c)
Active ingredient [compound of Formula (I)]	25 %	50 %	75 %
sodium lignosulfonate	5 %	5 %	-
sodium lauryl sulfate	3 %	-	5 %
sodium diisobutyl naphthalenesulfonate	-	6 %	10 %
phenol polyethylene glycol ether (7-8 mol of ethylene oxide)	-	2 %	-
highly dispersed silicic acid	5 %	10 %	10 %
Kaolin	62 %	27 %	-

The active ingredient is thoroughly mixed with the adjuvants and the mixture is thoroughly ground in a suitable mill, affording wettable powders that can be diluted with water to give suspensions of the desired concentration.

Powders for dry seed treatment

	a)	b)	c)
Active ingredient [compound of Formula (I)]	25 %	50 %	75 %
light mineral oil	5 %	5 %	5 %
highly dispersed silicic acid	5 %	5 %	-
Kaolin	65 %	40 %	-
Talcum	-	-	20 %

The active ingredient is thoroughly mixed with the adjuvants and the mixture is thoroughly ground in a suitable mill, affording powders that can be used directly for seed treatment.

Emulsifiable concentrate

active ingredient [compound of Formula (I)]	10 %
octylphenol polyethylene glycol ether (4-5 mol of ethylene oxide)	3 %
calcium dodecylbenzenesulfonate	3 %
castor oil polyglycol ether (35 mol of ethylene oxide)	4 %

Cyclohexanone	30 %
xylene mixture	50 %

Emulsions of any required dilution, which can be used in plant protection, can be obtained from this concentrate by dilution with water.

<u>Dusts</u>	a)	b)	c)
Active ingredient [compound of Formula (I)]	5 %	6 %	4 %
Talcum	95 %	-	-
Kaolin	-	94 %	-
mineral filler	-	-	96 %

5

Ready-for-use dusts are obtained by mixing the active ingredient with the carrier and grinding the mixture in a suitable mill. Such powders can also be used for dry dressings for seed.

Extruder granules

Active ingredient [compound of Formula (I)]	15 %
sodium lignosulfonate	2 %
Carboxymethylcellulose	1 %
Kaolin	82 %

10

The active ingredient is mixed and ground with the adjuvants, and the mixture is moistened with water. The mixture is extruded and then dried in a stream of air.

Coated granules

Active ingredient [compound of Formula (I)]	8 %
polyethylene glycol (mol. wt. 200)	3 %
Kaolin	89 %

15

The finely ground active ingredient is uniformly applied, in a mixer, to the kaolin moistened with polyethylene glycol. Non-dusty coated granules are obtained in this manner.

Suspension concentrate

Active ingredient [compound of Formula (I)]	40 %
propylene glycol	10 %
nonylphenol polyethylene glycol ether (15 mol of ethylene oxide)	6 %
Sodium lignosulfonate	10 %
Carboxymethylcellulose	1 %
Silicone oil (in the form of a 75 % emulsion in water)	1 %
Water	32 %

The finely ground active ingredient is intimately mixed with the adjuvants, giving a suspension concentrate from which suspensions of any desired dilution can be obtained by dilution with water. Using such dilutions, living plants as well as plant propagation material can be treated and protected against infestation by microorganisms, by spraying, pouring or immersion.

Flowable concentrate for seed treatment

Active ingredient [compound of Formula (I)]	40 %
propylene glycol	5 %
copolymer butanol PO/EO	2 %
tristyrenephenol with 10-20 moles EO	2 %
1,2-benzisothiazolin-3-one (in the form of a 20% solution in water)	0.5 %
monoazo-pigment calcium salt	5 %
Silicone oil (in the form of a 75 % emulsion in water)	0.2 %
Water	45.3 %

The finely ground active ingredient is intimately mixed with the adjuvants, giving a suspension concentrate from which suspensions of any desired dilution can be obtained by dilution with water. Using such dilutions, living plants as well as plant propagation material can be treated and protected against infestation by microorganisms, by spraying, pouring or immersion.

Slow-Release Capsule Suspension

28 parts of a combination of the compound of Formula I are mixed with 2 parts of an aromatic solvent and 7 parts of toluene diisocyanate/polymethylene-polyphenylisocyanate-mixture (8:1). This mixture is emulsified in a mixture of 1.2 parts of polyvinylalcohol, 0.05 parts of a defoamer and 51.6 parts of water until the desired particle size is achieved. To this emulsion a mixture of 2.8 parts 1,6-diaminohexane in 5.3 parts of water is added. The mixture is agitated until the polymerization reaction is completed.

The obtained capsule suspension is stabilized by adding 0.25 parts of a thickener and 3 parts of a dispersing agent. The capsule suspension Formulation contains 28% of the active ingredients. The medium capsule diameter is 8-15 microns.

The resulting formulation is applied to seeds as an aqueous suspension in an apparatus suitable for that purpose.

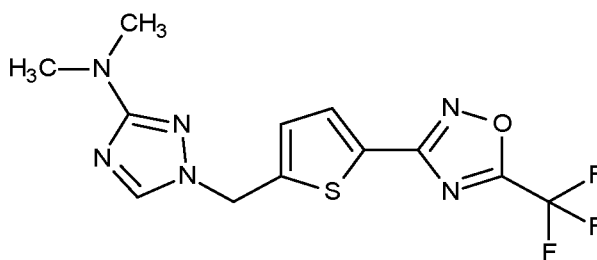
AIBN	= azobisisobutyronitrile
DMF	= dimethylformamide
DMA	= dimethylacetamide
DIPEA	= N,N-di-isopropylethylamine

	EtOAc	= ethyl acetate
	HCl	= hydrochloric acid
	mp	= melting point
	°C	= degrees celsius
5	MeOH	= methyl alcohol
	NaOH	= sodium hydroxide
	NBS	= N-bromosuccinimide
	min	= minutes
	rt	= room temperature
10	h	= hour(s)
	TFAA	= trifluoroacetic acid anhydride
	THF	= tetrahydrofuran
	R _t	= retention time (in minutes)
15	LC/MS	= Liquid Chromatography Mass Spectrometry (description of the apparatus and the methods used for LC/MS analysis are given above)

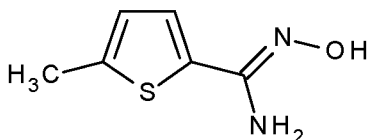
Preparation Examples

Using the synthetic techniques described both above and below, compounds of formula (I) may be prepared accordingly.

Example 1: This example illustrates the preparation of N,N-dimethyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]-1,2,4-triazol-3-amine (Compound 1.4 of Table T1)



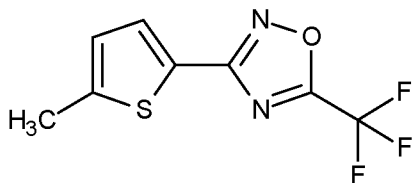
Step 1: Preparation of N'-hydroxy-5-methyl-thiophene-2-carboxamidine



To a suspension of 5-methylthiophene-2-carbonitrile (9.0 g, 73 mmol) in ethanol (365 mL) stirring at room temperature was added triethylamine (20.6 mL, 146 mmol) followed by the portionwise introduction of hydroxylamine hydrochloride (10.3 g, 146 mmol). The reaction contents were heated at reflux for 3.5 hours, cooled to 25°C, and concentrated under reduced pressure to provide N'-hydroxy-

5-methyl-thiophene-2-carboxamidine as a crude residue which was used in the next transformations without further purification. LC/MS (Method A) retention time = 0.24 minutes, 156 (M+H).

Step 2: Preparation of 3-(5-methyl-2-thienyl)-5-(trifluoromethyl)-1,2,4-oxadiazole



5

To a suspension of crude N'-hydroxy-5-methyl-thiophene-2-carboxamidine (32.0 g) in tetrahydrofuran (1.0 L) was introduced pyridine (24 mL, 292 mmol) and the contents were cooled to 10°C. To this suspension, TFAA (30.9 mL, 219 mL) was introduced dropwise. The reaction mixture was allowed to warm to 25°C overnight, and then concentrated at reduced pressure. The resultant residue was dissolved in ethyl acetate, washed with an aqueous 1M HCl solution, water, and a saturated aqueous Na₂CO₃ solution. The organic layer was dried over sodium sulfate, filtered, and the volatiles were removed at reduced pressure. The crude residue was purified by flash chromatography over silica gel using a cyclohexane/EtOAc eluent gradient to afford 3-(5-methyl-2-thienyl)-5-(trifluoromethyl)-1,2,4-oxadiazole as a clear oil (13.1 g, 76% yield). LC/MS (Method A) retention time = 1.13 minutes, mass not detected.

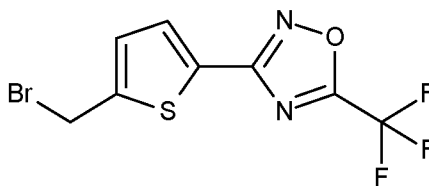
10

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¹H NMR (400 MHz, CDCl₃) δ ppm: 7.68 (d, 1H), 6.84 (d, 1H), 2.57 (s, 3H).

¹⁹F NMR (400 MHz, CDCl₃) δ ppm: -65.44 (s).

20 Step 3a: Preparation of 3-[5-(bromomethyl)-2-thienyl]-5-(trifluoromethyl)-1,2,4-oxadiazole



25

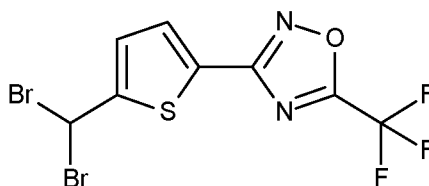
30

To a solution of 3-(5-methyl-2-thienyl)-5-(trifluoromethyl)-1,2,4-oxadiazole (13.1 g, 55.7 mmol) and tetrachloromethane (111 mL) under argon atmosphere was added AIBN (0.93 g, 5.6 mmol) then NBS (11.02 g, 61.3 mmol). The contents were heated at 70°C for 18 hours. The mixture was cooled to 25°C then diluted with dichloromethane and water. The layers were separated, the organic phase was dried over sodium sulfate, and the volatiles were removed under reduced pressure. The crude residue was purified by flash chromatography over silica gel using a cyclohexane/EtOAc eluent gradient to afford 3-[5-(bromomethyl)-2-thienyl]-5-(trifluoromethyl)-1,2,4-oxadiazole as a yellow oil (3.86 g, 22% yield). LC/MS (Method A) retention time = 1.14 minutes, mass not detected.

¹H NMR (400 MHz, CDCl₃) δ ppm: 8.11 (d, 1H), 7.55 (d, 1H), 4.53 (s, 2H).

¹⁹F NMR (400 MHz, CDCl₃) δ ppm: -65.31 (s).

3-[5-(dibromomethyl)-2-thienyl]-5-(trifluoromethyl)-1,2,4-oxadiazole was isolated as by-product as a yellow amorphous solid (13.0 g)



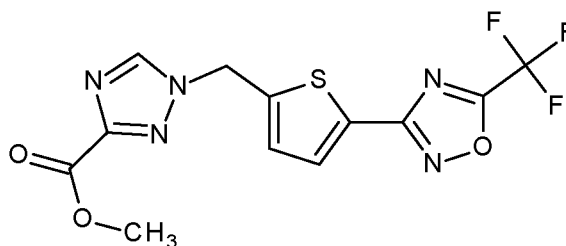
5 ^1H NMR (400 MHz, CDCl_3) δ ppm: 7.73 (d, 1H), 7.32 (d, 1H), 6.91 (s, 1H).

Step 4: Preparation of N,N-dimethyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]-1,2,4-triazol-3-amine

10 A solution of 3-[5-(bromomethyl)-2-thienyl]-5-(trifluoromethyl)-1,2,4-oxadiazole (150 mg, 0.48 mmol), N,N-dimethyl-4H-1,2,4-triazol-3-amine (64 mg, 0.57 mmol), and potassium carbonate (133 mg, 0.96 mmol) in acetonitrile (6.0 mL) was stirred at rt overnight. The solids were removed by filtration, washed with ethyl acetate, and the volatiles were removed under reduced pressure. The resultant residue purified by flash chromatography over silica gel using a cyclohexane/EtOAc eluent gradient to afford N,N-dimethyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]-1,2,4-triazol-3-amine as a yellow solid (49 mg, 30% yield). LC/MS (Method A) retention time = 0.96 minutes, 345 (M+H). mp: 113-116°C

20 ^1H NMR (400 MHz, CDCl_3) δ ppm: 7.78 (s, 1H), 7.75 (d, 1H), 7.11 (d, 1H), 5.37 (s, 2H), 2.99 (s, 6H).

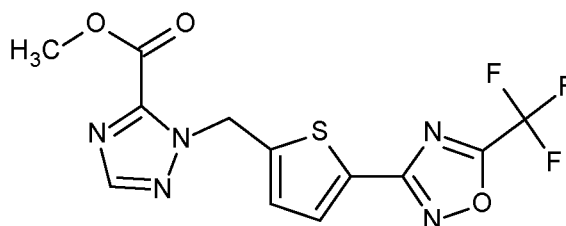
Example 2: This example illustrates the preparation of methyl 1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]-1,2,4-triazole-3-carboxylate (Compound 1.6 of Table T1)



25 A mixture of 3-[5-(bromomethyl)-2-thienyl]-5-(trifluoromethyl)-1,2,4-oxadiazole (1.0 g, 3.2 mmol), methyl 1H-1,2,4-triazole-3-carboxylate (610 mg, 4.8 mmol) and potassium carbonate (880 mg, 6.4 mmol) in acetonitrile (32 mL) was heated at 110°C for 2 hours. The resultant orange suspension was filtered to remove the solids and the filtrate solution was then concentrated under reduced pressure. The resultant crude residue was purified by chromatography on silica gel using a cyclohexane/ethyl acetate gradient to afford 750 mg of the title compound as a white solid. LC/MS (Method A) retention time = 0.91 minutes, 360 (M+H).

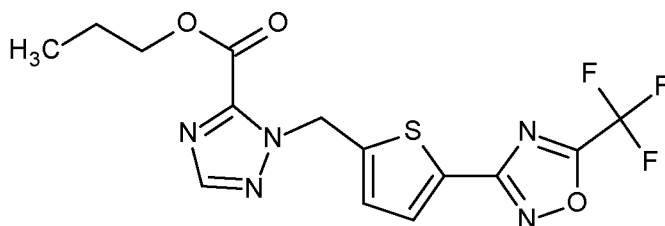
^1H NMR (400 MHz, CDCl_3) δ ppm: 8.25 (s, 1H), 7.81 (d, 1H), 7.22 (d, 1H), 5.65 (s, 2H), 4.05 (s, 3H).

- 5 methyl 2-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]-1,2,4-triazole-3-carboxylate (Compound 1.55 of Table T1) was isolated as a byproduct in form of a colorless gum (306 mg), LC/MS (Method A) retention time = 0.91 minutes, 360 (M+H).



- 10 ^1H NMR (400 MHz, CDCl_3) δ ppm: 8.05 (s, 1H), 7.75 (d, 1H), 7.22 (d, 1H), 6.50 (s, 2H), 4.05 (s, 3H).

Example 3: This example illustrates the preparation of propyl 2-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]-1,2,4-triazole-3-carboxylate (Compound 1.44 of Table T1)

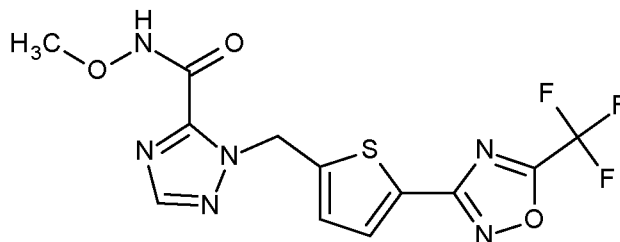


- 15 To a solution of methyl 2-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]-1,2,4-triazole-3-carboxylate (100 mg, 0.27 mmol) and propanol (0.83 mL) was introduced concentrated sulfuric acid (0.01 mL). The white suspension was stirred 12 hours under reflux during which time it turned into a clear solution. The reaction mixture was concentrated under reduced pressure and the residue was purified by flash chromatography on silica gel using a cyclohexane/ethyl acetate gradient
- 20 to afford 47mg of the title compound as a colorless gum. LC/MS (Method A) retention time = 1.10 minutes, 388 (M+H).

^1H NMR (400 MHz, CDCl_3) δ ppm: 8.05 (s, 1H), 7.75 (d, 1H), 7.25 (d, 1H), 6.05 (s, 2H), 4.45 (t, 2H), 1.85 (m, 2H), 1.05 (t, 3H).

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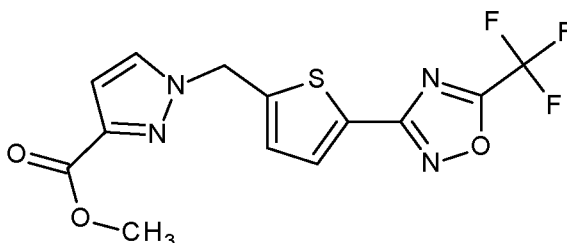
Example 4: This example illustrates the preparation of N-methyl-N-methoxy-2-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]-1,2,4-triazole-3-carboxamide (Compound 1.61 of Table T1)



To a clear solution of O-methylhydroxylamine hydrochloride (136 mg, 1.67 mmol) in toluene (2 mL) was introduced dropwise diethylaluminum chloride (1M in toluene, 1.67 mL, 1.67 mmol). After 10 minutes, methyl 2-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]-1,2,4-triazole-3-carboxylate (150 mg, 0.41 mmol) was added and the mixture was heated for 12 hours at 70°C. The reaction was quenched with water (ca. 0.030 mL) and the suspension was concentrated under reduced pressure. The resultant residue was purified by flash chromatography on silica gel using a cyclohexane/ethyl acetate gradient to afford 64 mg of the title compound as a white solid. m.p: 135-140°C; LC/MS (Method A) retention time = 0.93 minutes, 375 (M+H).

¹H NMR (400 MHz, CDCl₃) δ ppm: 7.95 (s, 1H), 7.75 (d, 1H), 7.35 (d, 1H), 6.12 (s, 2H), 3.97 (s, 3H).

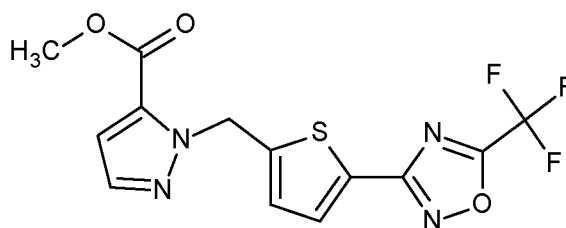
Example 5: This example illustrates the preparation of methyl 1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-3-carboxylate (Compound 1.53 of Table T1)



A mixture of 3-[5-(bromomethyl)-2-thienyl]-5-(trifluoromethyl)-1,2,4-oxadiazole (1.0 g, 3.2 mmol), methyl 1H-pyrazole-3-carboxylate (600 mg, 4.8 mmol) and potassium carbonate (880 mg, 6.4mmol) in acetonitrile (32 mL) was heated at 110°C for 2 hours. The orange suspension was filtered to remove the solids and the filtrate solution was then concentrated under reduced pressure. The resultant crude residue was purified by flash chromatography on silica gel using a cyclohexane/ethyl acetate gradient to afford 610 mg of the title compound as a white solid. LC/MS (Method A) retention time = 1.00 minutes, 359 (M+H).

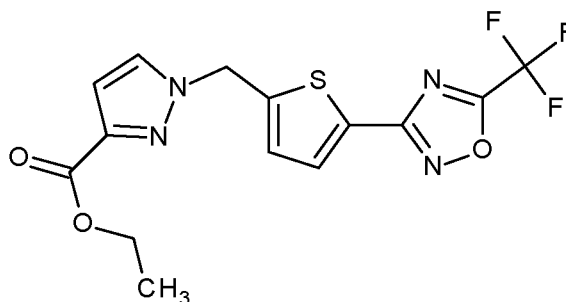
¹H NMR (400 MHz, CDCl₃) δ ppm: 7.78 (d, 1H), 7.51 (d, 1H), 7.12 (d, 1H), 6.89 (d, 1H), 5.61 (s, 2H), 3.98 (s, 3H).

methyl 2-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-3-carboxylate (Compound 1.54 of Table T1) was isolated as a byproduct in form of a white solid (274 mg). LC/MS (Method A) retention time = 1.10 minutes, 359 (M+H).



5 ^1H NMR (400 MHz, CDCl_3) δ ppm: 7.72 (d, 1H), 7.58 (d, 1H), 7.18 (d, 1H), 6.89 (d, 1H), 6.05 (s, 2H), 3.98 (s, 3H).

Example 6: This example illustrates the preparation of ethyl 1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-3-carboxylate (Compound 1.42 of Table T1)



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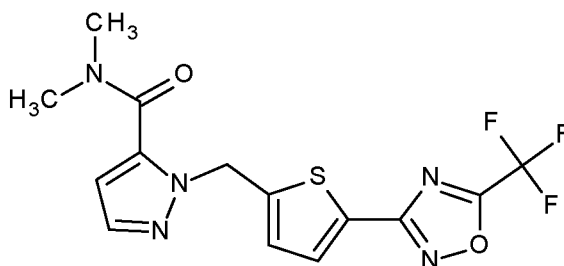
To a solution of methyl 1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-3-carboxylate (100 mg, 0.27 mmol) and ethanol (0.83 mL) was introduced concentrated sulfuric acid (0.01 mL). The white suspension was stirred for 2 hours at reflux during which time it became a clear solution. The reaction mixture was concentrated under reduced pressure and the resultant crude residue was purified by reverse phase column chromatography using a water/acetonitrile eluent gradient to afford 20 mg of the title compound as a white solid. mp: 120-124°C; LC/MS (Method A) retention time = 1.07 minutes, 373 (M+H).

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^1H NMR (400 MHz, CDCl_3) δ ppm: 7.71 (d, 1H), 7.52 (d, 1H), 7.12 (d, 1H), 6.85 (d, 1H), 5.62 (s, 2H), 4.45 (q, 2H), 1.45 (t, 3H).

20

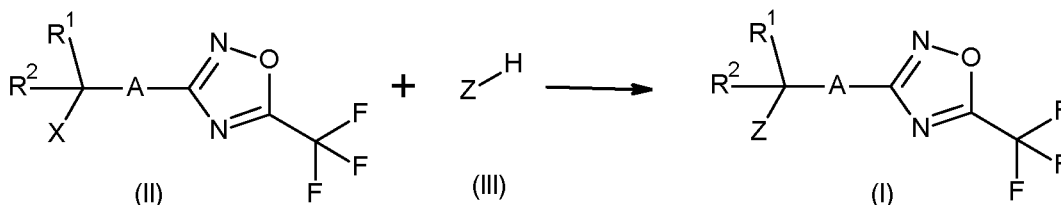
Example 7: This example illustrates the preparation of N,N-dimethyl-2-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-3-carboxamide (Compound 1.58 of Table T1)



To a clear solution of N-methylmethanamine hydrochloride (136 mg, 1.67 mmol) in toluene (2 mL) was introduced dropwise diethylaluminum chloride (1M in toluene, 1.67 mL, 1.67 mmol). After 10 minutes, methyl 2-[[5-[[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-3-carboxylate (150 mg, 0.41 mmol) was added and the mixture was heated for 12 hours at 70°C. The reaction was quenched with water (ca. 0.030 mL) and the suspension was concentrated under reduced pressure. The resultant residue was purified by flash chromatography on silica gel using a cyclohexane/ethyl acetate gradient to afford the title compound (105 mg, 67% yield) as a yellow gum. LC/MS (Method A) retention time = 0.96 minutes, 372 (M+H).

¹H NMR (400 MHz, CDCl₃) δ ppm: 7.71 (d, 1H), 7.55 (d, 1H), 7.12 (d, 1H), 6.42 (d, 1H), 5.78 (s, 2H), 3.05 (s, 3H), 3.15 (s, 3H).

The following general procedure was performed in a combinatorial fashion using appropriate building blocks (compounds of Formula (II) and (III)) to provide the compounds of Formula (I). The compounds prepared *via* the following combinatorial protocol were analyzed using LC/MS Method B.

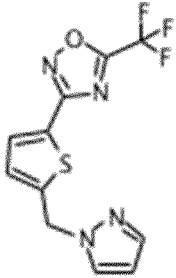
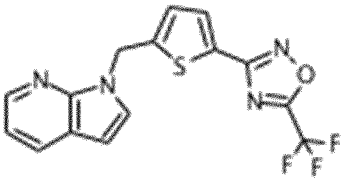
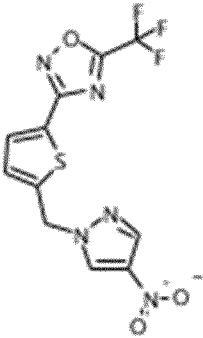
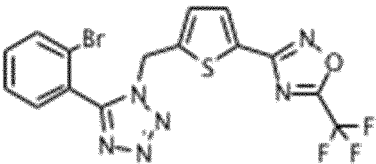
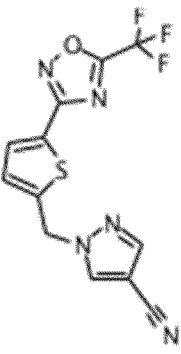


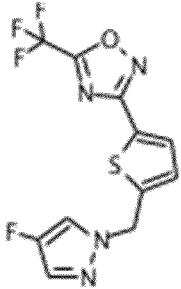
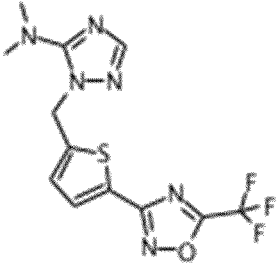
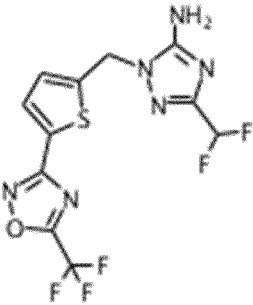
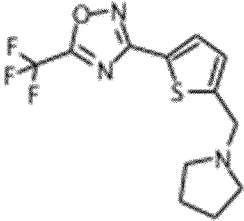
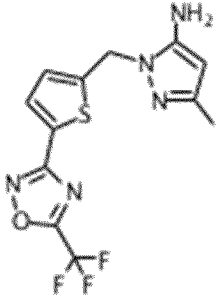
By way of exemplification, [[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]heteroaryl]methylbromide derivatives of formula (II) (0.03 mmol) in acetonitrile (1.0 mL) was transferred to microwave vials containing amine derivative of Formula (III) (0.03 mmol), potassium carbonate (0.06 mmol), and were stirred under microwaves irradiation at 120°C for 20 minutes in the parallel microwave apparatus. The solvent was removed under a stream of nitrogen. The resultant crude residues were solubilized in a mixture of MeOH (250 µL) and DMA (500 µL) and directly submitted for preparative LC/MS purification which provided the compounds of Formula (I). Structures of isomers were assigned by NMR techniques.

Where necessary, enantiomerically pure final compounds may be obtained from racemic materials as appropriate *via* standard physical separation techniques, such as reverse phase chiral chromatography, or through stereoselective synthetic techniques, (e.g., by using chiral starting materials).

Table T1: Melting point (mp) data and/or retention times (R_t) for compounds according to Formula (I):

Entry	Name	Structure	R _t (min)	Mass charge	Method	mp (°C)
1.1	ethyl 1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-4-carboxylate		1.08	373.2	B	115.7 - 116.5
1.2	3-[5-(1,2,4-triazol-1-ylmethyl)-2-thienyl]-5-(trifluoromethyl)-1,2,4-oxadiazole		0.89	302.3	A	
1.3	5,5-dimethyl-2-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]isoxazolidin-3-one		1.04	348.2	A	
1.4	<i>N,N</i> -dimethyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]-1,2,4-triazol-3-amine					113 - 116
1.5	3-[5-[(4-methylpyrazol-1-yl)methyl]-2-thienyl]-5-(trifluoromethyl)-1,2,4-oxadiazole		1.63	315	B	
1.6	methyl 1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]-1,2,4-triazole-3-carboxylate		1.34	360	B	

Entry	Name	Structure	R _t (min)	Mass charge	Method	mp (°C)
1.7	3-[5-(pyrazol-1-ylmethyl)-2-thienyl]-5-(trifluoromethyl)-1,2,4-oxadiazole		1.52	301	B	
1.8	3-[5-(pyrrolo[2,3-b]pyridin-1-ylmethyl)-2-thienyl]-5-(trifluoromethyl)-1,2,4-oxadiazole		0.95	351	B	
1.9	3-[5-[(4-nitropyrazol-1-yl)methyl]-2-thienyl]-5-(trifluoromethyl)-1,2,4-oxadiazole		1.63	346.4	B	
1.10	3-[5-[[5-(2-bromophenyl)tetrazol-1-yl)methyl]-2-thienyl]-5-(trifluoromethyl)-1,2,4-oxadiazole		1.74	457	B	
1.11	1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-4-carbonitrile		1.54	326	B	

Entry	Name	Structure	R _t (min)	Mass charge	Method	mp (°C)
1.12	3-[5-[(4-fluoropyrazol-1-yl)methyl]-2-thienyl]-5-(trifluoromethyl)-1,2,4-oxadiazole		1.63	319	B	
1.13	<i>N,N</i> -dimethyl-2-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]-1,2,4-triazol-3-amine		1.44	345.1	B	
1.14	5-(difluoromethyl)-2-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]-1,2,4-triazol-3-amine		1.36	367	B	
1.15	3-[5-(pyrrolidin-1-ylmethyl)-2-thienyl]-5-(trifluoromethyl)-1,2,4-oxadiazole		0.84	304	B	
1.16	5-methyl-2-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazol-3-amine		1.14	330	B	

Entry	Name	Structure	R _t (min)	Mass charge	Method	mp (°C)
1.17	3-[5-(imidazol-1-ylmethyl)-2-thienyl]-5-(trifluoromethyl)-1,2,4-oxadiazole		0.83	301	B	
1.18	4-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]morpholine		0.89	320	B	
1.19	methyl 3-(methoxymethyl)-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-4-carboxylate		1.58	403.1	B	
1.20	3-[5-(azetidin-1-ylmethyl)-2-thienyl]-5-(trifluoromethyl)-1,2,4-oxadiazole		0.82	290	B	
1.21	3-[5-[(3,5-dimethylpyrazol-1-yl)methyl]-2-thienyl]-5-(trifluoromethyl)-1,2,4-oxadiazole		1.68	329	B	
1.22	1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-4-carbaldehyde		1.41	3.29	B	

Entry	Name	Structure	R _t (min)	Mass charge	Method	mp (°C)
1.23	3-[5-[(6-methoxybenzimidazol-1-yl)methyl]-2-thienyl]-5-(trifluoromethyl)-1,2,4-oxadiazole		1.25	381.1	B	
1.24	3-[5-[(5-methoxybenzimidazol-1-yl)methyl]-2-thienyl]-5-(trifluoromethyl)-1,2,4-oxadiazole		1.28	381.1	B	
1.25	3-[5-(benzimidazol-1-ylmethyl)-2-thienyl]-5-(trifluoromethyl)-1,2,4-oxadiazole		1.28	351	B	
1.26	ethyl 1-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-4-carboxylate					119 - 123
1.27	6-methyl-1-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyridin-2-one		0.97	342	A	

Entry	Name	Structure	R _t (min)	Mass charge	Method	mp (°C)
1.28	5,5-dimethyl-2-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]isoxazolidin-3-one		1.03	348	A	
1.29	2-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]-1,2-thiazolidine 1,1-dioxide		0.96	mass not detected	A	
1.30	ethyl 1-[1-[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]ethyl]pyrazole-4-carboxylate		1.12	387	A	
1.31	1-[[4-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]piperidin-2-one		0.98	332	A	
1.32	2-[1-[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]ethyl]-1,2-thiazolidine 1,1-dioxide		1.01	384	A	
1.33	6-methyl-1-[1-[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]ethyl]pyridin-2-one		1.02	356	A	
1.34	1-[1-[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]ethyl]piperidin-2-one		1.04	346	A	

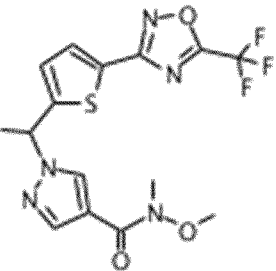
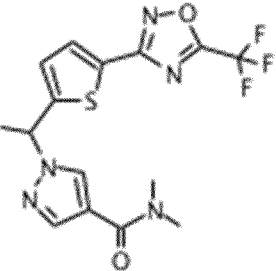
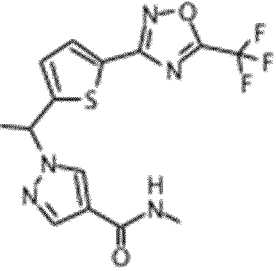
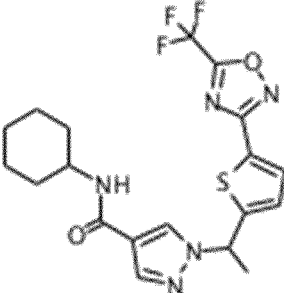
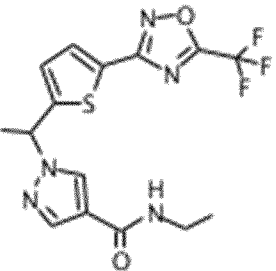
Entry	Name	Structure	R _t (min)	Mass charge	Method	mp (°C)
1.35	azetidin-1-yl-[1-[1-[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]ethyl]pyrazol-4-yl]methanone					76 - 78
1.36	1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-4-carboxylic acid					182 - 185
1.37	1-[1-[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]ethyl]pyrazole-4-carboxylic acid					133 - 143
1.38	N-methyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-4-carboxamide					150.8 - 155.7
1.39	N-(2-methoxyethyl)-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-4-carboxamide					135.3 - 137.9
1.40	ethyl 1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]-1,2,4-triazole-3-carboxylate					136 - 140
1.41	ethyl 2-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-		1.05	374	<u>A</u>	

Entry	Name	Structure	R _t (min)	Mass charge	Method	mp (°C)
	thienyl)methyl]-1,2,4-triazole-3-carboxylate					
1.42	ethyl 1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl)methyl]pyrazole-3-carboxylate					120 - 124
1.43	propyl 1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl)methyl]-1,2,4-triazole-3-carboxylate					140 - 160
1.44	propyl 2-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl)methyl]-1,2,4-triazole-3-carboxylate		1.09	388	<u>A</u>	
1.45	ethyl 2-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl)methyl]pyrazole-3-carboxylate		1.16	373	<u>A</u>	
1.46	propyl 1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl)methyl]pyrazole-3-carboxylate					88 - 94
1.47	propyl 2-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl)methyl]pyrazole-3-carboxylate		1.22	387	A	

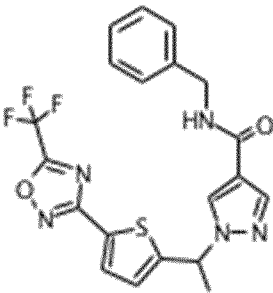
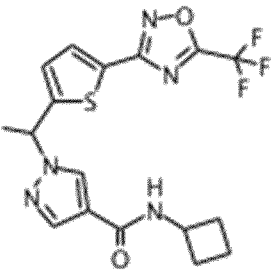
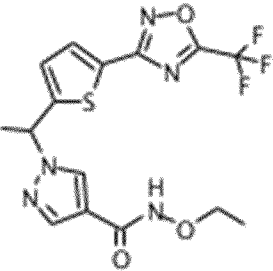
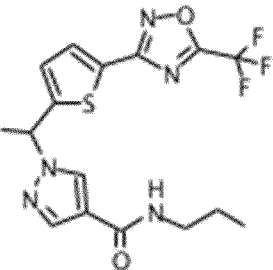
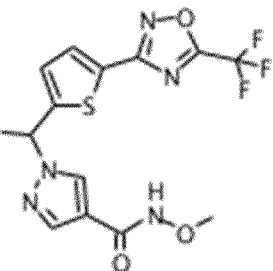
Entry	Name	Structure	R _t (min)	Mass charge	Method	mp (°C)
1.48	<i>N</i> -methyl-2-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]-1,2,4-triazole-3-carboxamide					132 - 140
1.49	<i>N</i> -methyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]-1,2,4-triazole-3-carboxamide					198 - 218
1.50	<i>N,N</i> -dimethyl-2-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]-1,2,4-triazole-3-carboxamide		0.96	373	A	
1.51	<i>N</i> -methyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-3-carboxamide					124 - 126
1.52	<i>N</i> -methyl-2-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-3-carboxamide					148 - 151
1.53	methyl 1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-3-carboxylate		1.00	359	A	
1.54	methyl 2-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-3-carboxylate		1.10	359	A	

Entry	Name	Structure	R _t (min)	Mass charge	Method	mp (°C)
1.55	methyl 2-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]-1,2,4-triazole-3-carboxylate		0.98	360	A	
1.56	N-methoxy-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-3-carboxamide					134 - 141
1.57	N,N-dimethyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-3-carboxamide					90 - 96
1.58	N,N-dimethyl-2-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-3-carboxamide		0.96	388	A	
1.59	N-methoxy-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]-1,2,4-triazole-3-carboxamide					168 - 178
1.60	N-methoxy-2-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-3-carboxamide					105 - 115
1.61	N-methoxy-2-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]-1,2,4-triazole-3-carboxamide					135 - 140

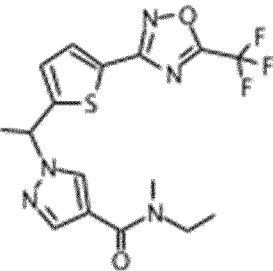
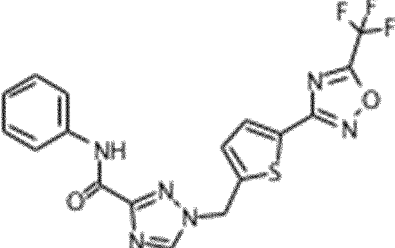
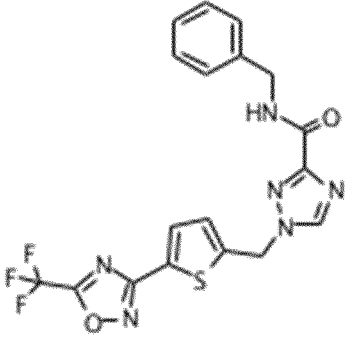
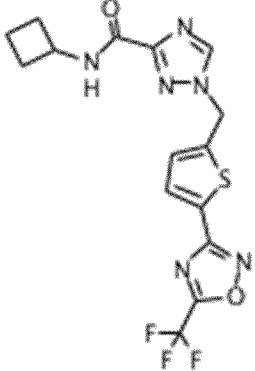
Entry	Name	Structure	R _t (min)	Mass charge	Method	mp (°C)
1.62	1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-3-carboxylic acid					140 - 150
1.63	1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]-1,2,4-triazole-3-carboxylic acid					210 - 220
1.64	2-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-3-carboxylic acid					145 - 165
1.65	<i>N</i> -sec-butyl-1-[1-[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]ethyl]pyrazole-4-carboxamide		1.60	414.08	B	
1.66	<i>N</i> -(2,2-dimethylpropyl)-1-[1-[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]ethyl]pyrazole-4-carboxamide		1.70	428.09	B	
1.67	<i>N</i> -isopropyl-1-[1-[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]ethyl]pyrazole-4-carboxamide		1.52	400.06	B	

Entry	Name	Structure	R _t (min)	Mass charge	Method	mp (°C)
1.68	<i>N</i> -methoxy- <i>N</i> -methyl-1-[1-[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]ethyl]pyrazole-4-carboxamide		1.52	402.03	B	
1.69	<i>N,N</i> -dimethyl-1-[1-[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]ethyl]pyrazole-4-carboxamide		1.43	386.05	B	
1.70	<i>N</i> -methyl-1-[1-[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]ethyl]pyrazole-4-carboxamide		1.33	372.02	B	
1.71	<i>N</i> -cyclohexyl-1-[1-[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]ethyl]pyrazole-4-carboxamide		1.71	440.09	B	
1.72	<i>N</i> -ethyl-1-[1-[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]ethyl]pyrazole-4-carboxamide		1.43	386.05	B	

Entry	Name	Structure	R _t (min)	Mass charge	Method	mp (°C)
1.73	<i>N</i> -allyl-1-[1-[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]ethyl]pyrazole-4-carboxamide		1.48	398.05	B	
1.74	<i>N</i> -isobutyl-1-[1-[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]ethyl]pyrazole-4-carboxamide		1.61	414.08	B	
1.75	<i>N</i> -cyclopropyl-1-[1-[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]ethyl]pyrazole-4-carboxamide		1.44	398.05	B	
1.76	<i>N,N</i> -diethyl-1-[1-[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]ethyl]pyrazole-4-carboxamide		1.61	414.09	B	
1.77	<i>N</i> -phenyl-1-[1-[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]ethyl]pyrazole-4-carboxamide		1.69	434.05	B	

Entry	Name	Structure	R _t (min)	Mass charge	Method	mp (°C)
1.78	<i>N</i> -benzyl-1-[1-[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]ethyl]pyrazole-4-carboxamide		1.65	448.07	B	
1.79	<i>N</i> -cyclobutyl-1-[1-[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]ethyl]pyrazole-4-carboxamide		1.57	412.07	B	
1.80	<i>N</i> -ethoxy-1-[1-[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]ethyl]pyrazole-4-carboxamide		1.42	402.05	B	
1.81	<i>N</i> -propyl-1-[1-[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]ethyl]pyrazole-4-carboxamide		1.52	400.07	B	
1.82	<i>N</i> -methoxy-1-[1-[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]ethyl]pyrazole-4-carboxamide		1.35	388.04	B	

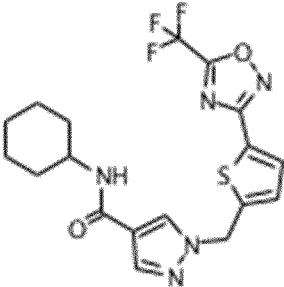
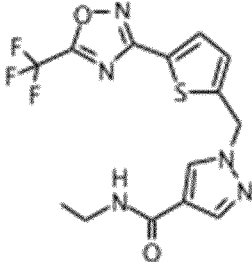
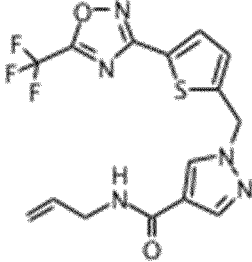
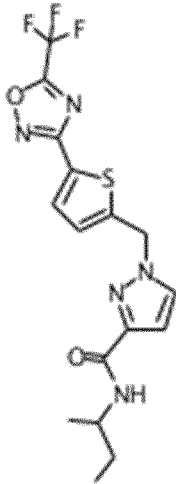
Entry	Name	Structure	R _t (min)	Mass charge	Method	mp (°C)
1.83	<i>N</i> -cyclopentyl-1-[1-[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]ethyl]pyrazole-4-carboxamide		1.64	426.08	B	
1.84	morpholino-[1-[1-[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]ethyl]pyrazol-4-yl]methanone		1.42	428.06	B	
1.85	<i>N</i> -(2-furylmethyl)-1-[1-[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]ethyl]pyrazole-4-carboxamide		1.55	438.04	B	
1.86	<i>N</i> -tert-butyl-1-[1-[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]ethyl]pyrazole-4-carboxamide		1.66	414.07	B	
1.87	<i>N</i> -prop-2-ynyl-1-[1-[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]ethyl]pyrazole-4-carboxamide		1.43	396.01	B	

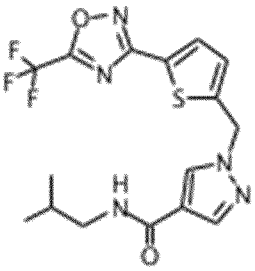
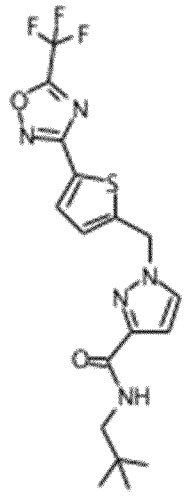
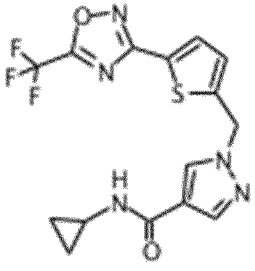
Entry	Name	Structure	R _t (min)	Mass charge	Method	mp (°C)
1.88	<i>N</i> -ethyl- <i>N</i> -methyl-1-[1-[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]ethyl]pyrazole-4-carboxamide		1.52	400.05	B	
1.89	<i>N</i> -phenyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]-1,2,4-triazole-3-carboxamide		1.56	421.00	B	
1.90	<i>N</i> -benzyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]-1,2,4-triazole-3-carboxamide		1.55	435.01	B	
1.91	<i>N</i> -cyclobutyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]-1,2,4-triazole-3-carboxamide		1.46	398.99	B	

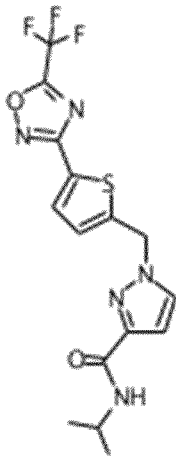
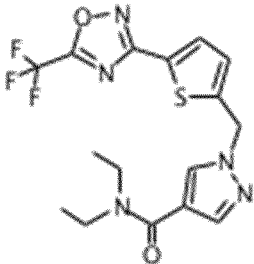
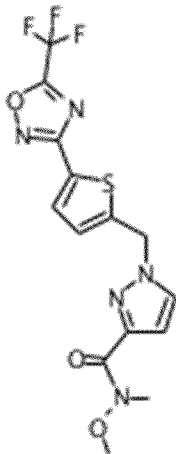
Entry	Name	Structure	R _t (min)	Mass charge	Method	mp (°C)
1.92	N-ethoxy-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]-1,2,4-triazole-3-carboxamide		1.24	388.96	B	
1.93	N-propyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]-1,2,4-triazole-3-carboxamide		1.41	386.99	B	
1.94	N-cyclopentyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]-1,2,4-triazole-3-carboxamide		1.54	413.02	B	
1.95	morpholino-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]-1,2,4-triazol-3-yl]methanone		1.27	414.99	B	

Entry	Name	Structure	R _t (min)	Mass charge	Method	mp (°C)
1.96	<i>N</i> -(2-furylmethyl)-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]-1,2,4-triazole-3-carboxamide		1.42	424.99	B	
1.97	<i>N</i> -tert-butyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]-1,2,4-triazole-3-carboxamide		1.54	401.01	B	
1.98	<i>N</i> -prop-2-ynyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]-1,2,4-triazole-3-carboxamide		1.28	382.96	B	
1.99	<i>N</i> -ethyl- <i>N</i> -methyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]-1,2,4-triazole-3-carboxamide		1.38	386.99	B	

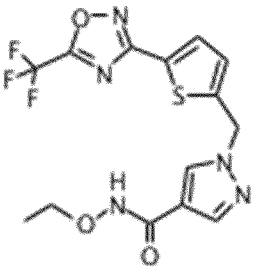
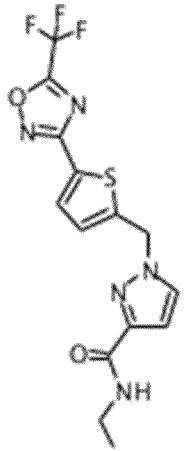
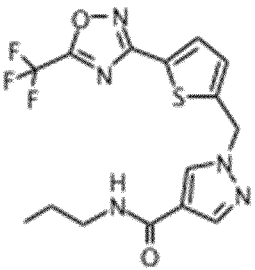
Entry	Name	Structure	R _t (min)	Mass charge	Method	mp (°C)
1.100	<i>N</i> -sec-butyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-4-carboxamide		1.52	400.02	B	
1.101	<i>N</i> -(2,2-dimethylpropyl)-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-4-carboxamide		1.63	414.03	B	
1.102	<i>N</i> -isopropyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-4-carboxamide		1.44	385.99	B	
1.103	<i>N</i> -methoxy- <i>N</i> -methyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-4-carboxamide		1.43	387.97	B	
1.104	<i>N,N</i> -dimethyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-4-carboxamide		1.34	371.97	B	

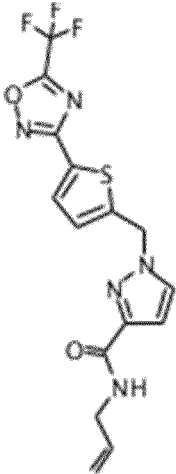
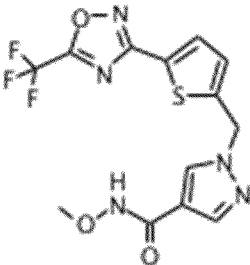
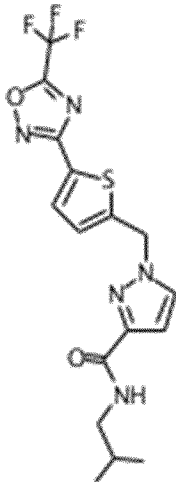
Entry	Name	Structure	R _t (min)	Mass charge	Method	mp (°C)
1.105	<i>N</i> -cyclohexyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-4-carboxamide		1.65	426.04	B	
1.106	<i>N</i> -ethyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-4-carboxamide		1.34	371.97	B	
1.107	<i>N</i> -allyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-4-carboxamide		1.39	383.97	B	
1.108	<i>N</i> -sec-butyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-3-carboxamide		1.66	400.02	B	

Entry	Name	Structure	R _t (min)	Mass charge	Method	mp (°C)
1.109	<i>N</i> -isobutyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-4-carboxamide		1.52	400.01	B	
1.110	<i>N</i> -(2,2-dimethylpropyl)-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-3-carboxamide		1.76	414.04	B	
1.111	<i>N</i> -cyclopropyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-4-carboxamide		1.36	383.97	B	

Entry	Name	Structure	R _t (min)	Mass charge	Method	mp (°C)
1.112	<i>N</i> -isopropyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-3-carboxamide		1.57	386.00	B	
1.113	<i>N,N</i> -diethyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-4-carboxamide		1.58	400.01	B	
1.114	<i>N</i> -methoxy- <i>N</i> -methyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-3-carboxamide		1.45	387.97	B	

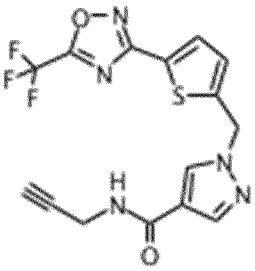
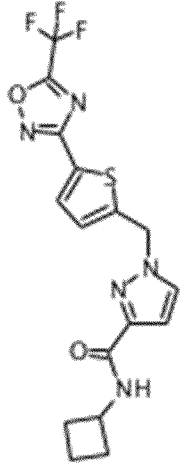
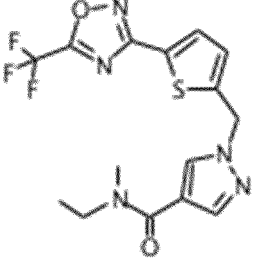
Entry	Name	Structure	R _t (min)	Mass charge	Method	mp (°C)
1.115	<i>N</i> -phenyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-4-carboxamide		1.61	420.00	B	
1.116	<i>N</i> -benzyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-4-carboxamide		1.55	434.01	B	
1.117	<i>N</i> -cyclobutyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-4-carboxamide		1.49	398.00	B	
1.118	<i>N</i> -cyclohexyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-3-carboxamide		1.80	426.05	B	

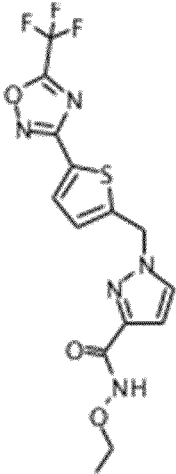
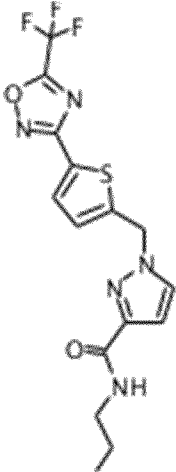
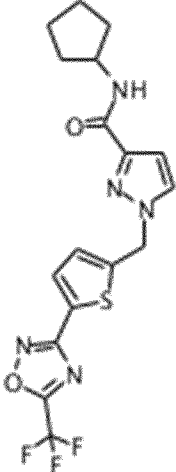
Entry	Name	Structure	R _t (min)	Mass charge	Method	mp (°C)
1.119	<i>N</i> -ethoxy-1-[[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-4-carboxamide		1.33	387.97	B	
1.120	<i>N</i> -ethyl-1-[[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-3-carboxamide		1.46	371.97	B	
1.121	<i>N</i> -propyl-1-[[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-4-carboxamide		1.44	385.99	B	

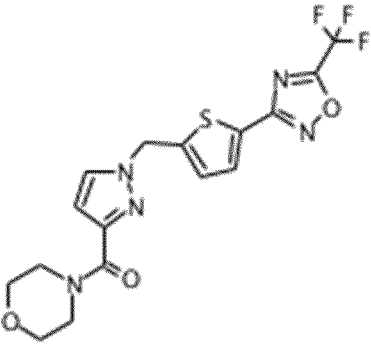
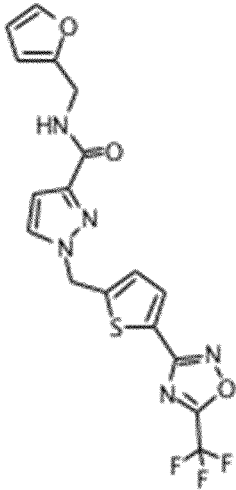
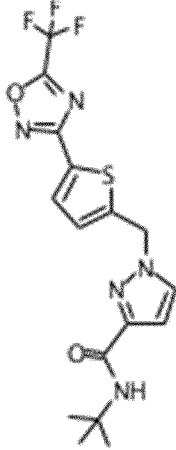
Entry	Name	Structure	R _t (min)	Mass charge	Method	mp (°C)
1.122	<i>N</i> -allyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-3-carboxamide		1.52	383.97	B	
1.123	<i>N</i> -methoxy-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-4-carboxamide		1.25	373.94	B	
1.124	<i>N</i> -isobutyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-3-carboxamide		1.67	400.01	B	

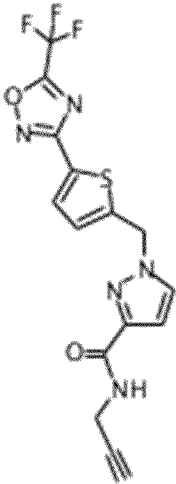
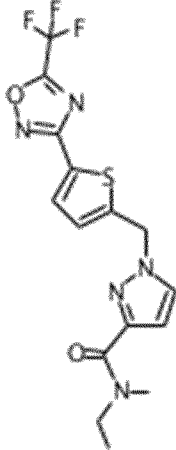
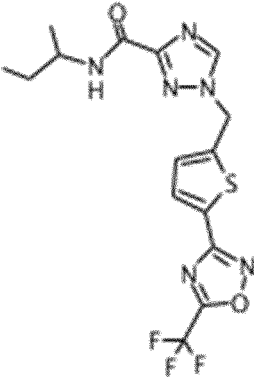
Entry	Name	Structure	R _t (min)	Mass charge	Method	mp (°C)
1.125	<i>N</i> -cyclopentyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-4-carboxamide		1.54	412.02	B	
1.126	<i>N</i> -cyclopropyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-3-carboxamide		1.47	383.97	B	
1.127	morpholino-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazol-4-yl]methanone		1.33	414.00	B	
1.128	<i>N,N</i> -diethyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-3-carboxamide		1.66	400.02	B	

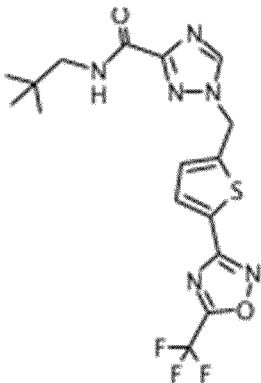
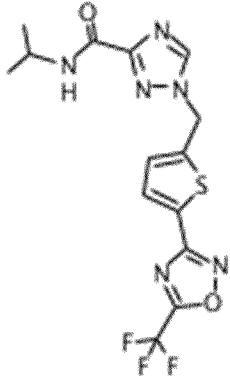
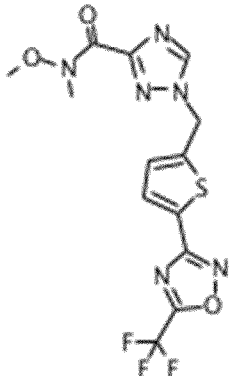
Entry	Name	Structure	R _t (min)	Mass charge	Method	mp (°C)
1.129	<i>N</i> -(2-furylmethyl)-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-4-carboxamide		1.47	423.98	B	
1.130	<i>N</i> -phenyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-3-carboxamide		1.75	420.00	B	
1.131	<i>N</i> -tert-butyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-4-carboxamide		1.58	400.01	B	
1.132	<i>N</i> -benzyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-3-carboxamide		1.69	434.02	B	

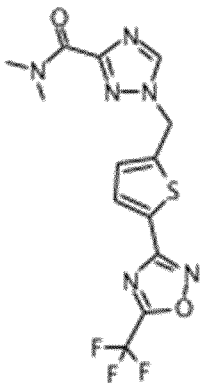
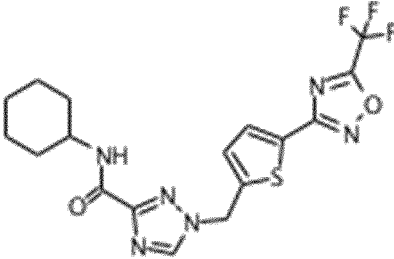
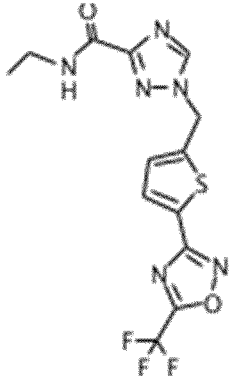
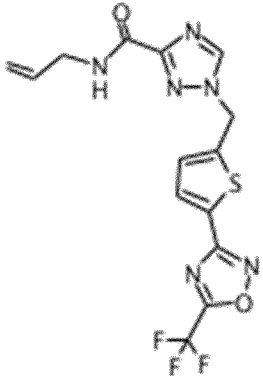
Entry	Name	Structure	R _t (min)	Mass charge	Method	mp (°C)
1.133	<i>N</i> -prop-2-ynyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-4-carboxamide		1.34	381.96	B	
1.134	<i>N</i> -cyclobutyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-3-carboxamide		1.62	397.99	B	
1.135	<i>N</i> -ethyl- <i>N</i> -methyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-4-carboxamide		1.43	385.99	B	

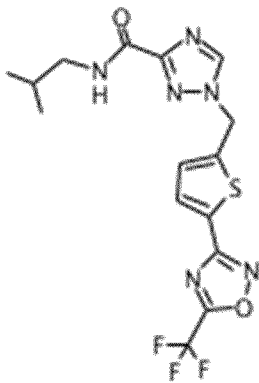
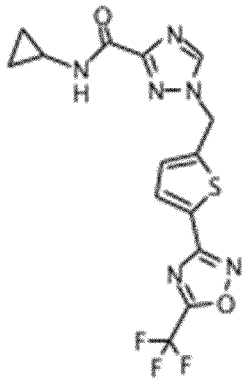
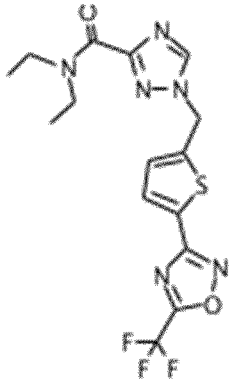
Entry	Name	Structure	R _t (min)	Mass charge	Method	mp (°C)
1.136	<i>N</i> -ethoxy-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-3-carboxamide		1.40	387.98	B	
1.137	<i>N</i> -propyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-3-carboxamide		1.57	386.00	B	
1.138	<i>N</i> -cyclopentyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-3-carboxamide		1.59	424.00	B	

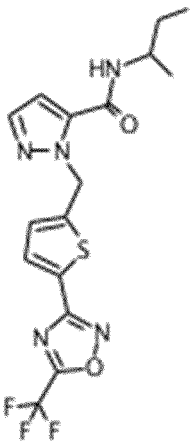
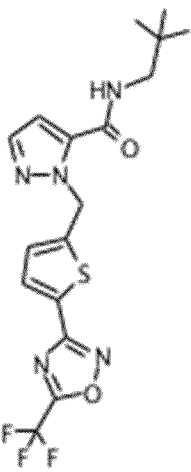
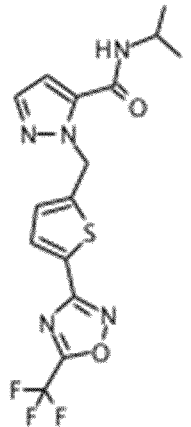
Entry	Name	Structure	R _t (min)	Mass charge	Method	mp (°C)
1.139	morpholino-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazol-3-yl]methanone		1.73	400.01	B	
1.140	<i>N</i> -(2-furylmethyl)-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-3-carboxamide		1.45	381.96	B	
1.141	<i>N</i> - <i>tert</i> -butyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-3-carboxamide		1.59	424.00	B	

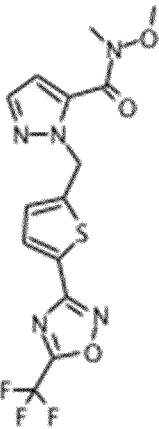
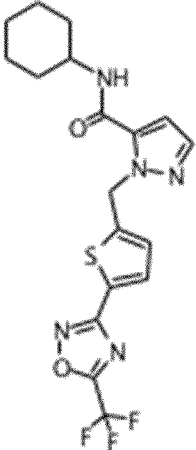
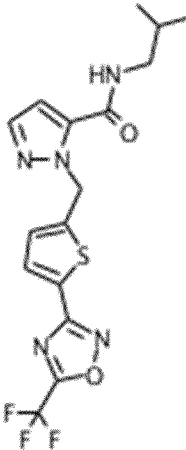
Entry	Name	Structure	R _t (min)	Mass charge	Method	mp (°C)
1.142	<i>N</i> -prop-2-ynyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-3-carboxamide		1.73	400.01	B	
1.143	<i>N</i> -ethyl- <i>N</i> -methyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-3-carboxamide		1.53	386.00	B	
1.144	<i>N</i> -sec-butyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]-1,2,4-triazole-3-carboxamide		1.51	401.01	B	

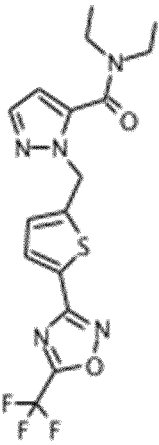
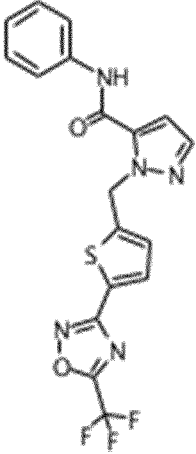
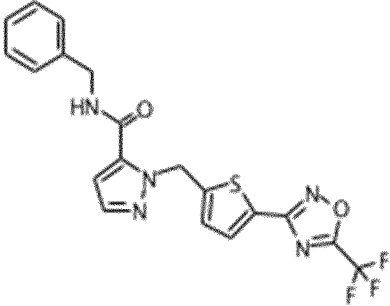
Entry	Name	Structure	R _t (min)	Mass charge	Method	mp (°C)
1.145	<i>N</i> -(2,2-dimethylpropyl)-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]-1,2,4-triazole-3-carboxamide		1.62	415.03	B	
1.146	<i>N</i> -isopropyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]-1,2,4-triazole-3-carboxamide		1.41	386.99	B	
1.147	<i>N</i> -methoxy- <i>N</i> -methyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]-1,2,4-triazole-3-carboxamide		1.32	388.97	B	

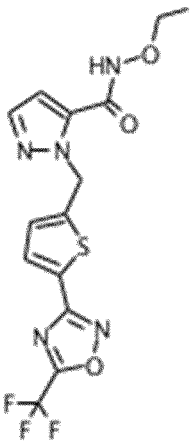
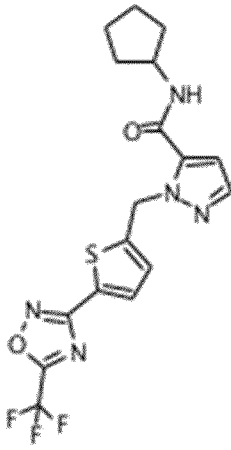
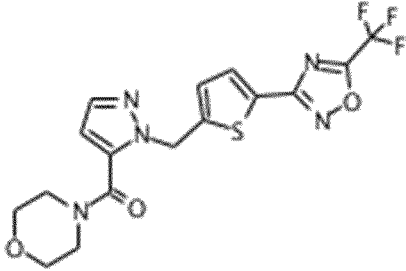
Entry	Name	Structure	R _t (min)	Mass charge	Method	mp (°C)
1.148	<i>N,N</i> -dimethyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]-1,2,4-triazole-3-carboxamide		1.28	372.97	B	
1.149	<i>N</i> -cyclohexyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]-1,2,4-triazole-3-carboxamide		1.64	427.04	B	
1.150	<i>N</i> -ethyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]-1,2,4-triazole-3-carboxamide		1.30	372.97	B	
1.151	<i>N</i> -allyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]-1,2,4-triazole-3-carboxamide		1.36	384.97	B	

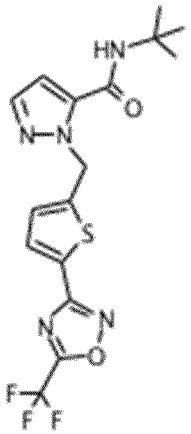
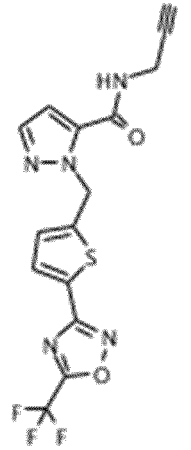
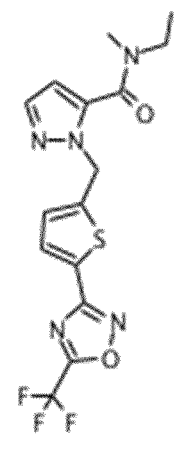
Entry	Name	Structure	R _t (min)	Mass charge	Method	mp (°C)
1.152	<i>N</i> -isobutyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]-1,2,4-triazole-3-carboxamide		1.50	401.01	B	
1.153	<i>N</i> -cyclopropyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]-1,2,4-triazole-3-carboxamide		1.32	384.97	B	
1.154	<i>N,N</i> -diethyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]-1,2,4-triazole-3-carboxamide		1.49	401.01	B	

Entry	Name	Structure	R _t (min)	Mass charge	Method	mp (°C)
1.155	<i>N</i> -sec-butyl-2-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-3-carboxamide		1.72	400.07	B	
1.156	<i>N</i> -(2,2-dimethylpropyl)-2-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-3-carboxamide		1.83	414.09	B	
1.157	<i>N</i> -isopropyl-2-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-3-carboxamide		1.62	386.04	B	

Entry	Name	Structure	R _t (min)	Mass charge	Method	mp (°C)
1.158	<i>N</i> -methoxy- <i>N</i> -methyl-2-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-3-carboxamide		1.58	388.02	B	
1.159	<i>N</i> -cyclohexyl-2-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-3-carboxamide		1.86	426.09	B	
1.160	<i>N</i> -isobutyl-2-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-3-carboxamide		1.73	400.07	B	

Entry	Name	Structure	R _t (min)	Mass charge	Method	mp (°C)
1.161	<i>N,N</i> -diethyl-2-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-3-carboxamide		1.65	400.07	B	
1.162	<i>N</i> -phenyl-2-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-3-carboxamide		1.79	420.03	B	
1.163	<i>N</i> -benzyl-2-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-3-carboxamide		1.75	434.05	B	

Entry	Name	Structure	R _t (min)	Mass charge	Method	mp (°C)
1.164	<i>N</i> -ethoxy-2-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-3-carboxamide		1.46	388.02	B	
1.165	<i>N</i> -cyclopentyl-2-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-3-carboxamide		1.76	412.08	B	
1.166	morpholino-2-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazol-3-yl]methanone		1.43	414.05	B	

Entry	Name	Structure	R _t (min)	Mass charge	Method	mp (°C)
1.167	<i>N</i> -tert-butyl-2-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-3-carboxamide		1.79	400.07	B	
1.168	<i>N</i> -prop-2-ynyl-2-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-3-carboxamide		1.50	382.02	B	
1.169	<i>N</i> -ethyl- <i>N</i> -methyl-2-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]pyrazole-3-carboxamide		1.54	386.08	B	

Entry	Name	Structure	R _t (min)	Mass charge	Method	mp (°C)
1.170	<i>N</i> -methyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]imidazole-4-carboxamide		1.20	358	C	
1.171	<i>N</i> -cyclopropyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]imidazole-4-carboxamide					
1.172	<i>N,N</i> -dimethyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]imidazole-4-carboxamide					
1.173	<i>N</i> -prop-2-ynyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]imidazole-4-carboxamide					
1.174	<i>N</i> -methoxy-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]imidazole-4-carboxamide		1.37	374	C	

Entry	Name	Structure	R _t (min)	Mass charge	Method	mp (°C)
1.175	N-isopropyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]imidazole-4-carboxamide					
1.176	N-methyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]imidazole-2-carboxamide		1.39	358	C	
1.177	N-cyclopropyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]imidazole-2-carboxamide		1.46	384	C	
1.178	N,N-dimethyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]imidazole-2-carboxamide		1.31	372	C	
1.179	N-prop-2-ynyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]imidazole-2-carboxamide		1.45	Not detected	C	
1.180	N-methoxy-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]imidazole-2-carboxamide		1.37	374	C	

Entry	Name	Structure	R _t (min)	Mass charge	Method	mp (°C)
1.181	N-isopropyl-1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]imidazole-2-carboxamide					
1.182	N-methyl-3-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]imidazole-4-carboxamide		0.90	358	C	
1.183	N-cyclopropyl-3-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]imidazole-4-carboxamide					
1.184	<i>N,N</i> -dimethyl-3-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]imidazole-4-carboxamide					
1.185	N-prop-2-ynyl-3-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]imidazole-4-carboxamide					
1.186	N-methoxy-3-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]imidazole-4-carboxamide					

Entry	Name	Structure	R _t (min)	Mass charge	Method	mp (°C)
1.187	N-isopropyl-3-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]imidazole-4-carboxamide					
1.188	methyl 1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]imidazole-2-carboxylate		1.39	359	C	
1.189	methyl 3-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]imidazole-4-carboxylate		1.39	359	C	
1.190	methyl 1-[[5-[5-(trifluoromethyl)-1,2,4-oxadiazol-3-yl]-2-thienyl]methyl]imidazole-4-carboxylate		1.33	359	C	

BIOLOGICAL EXAMPLES

- 5 Leaf disks or leaf segments of various plant species are cut from plants grown in a greenhouse. The cut leaf disks or segments are placed in multiwell plates (24-well format) onto water agar. The leaf disks are sprayed with a test solution before (preventative) or after (curative) inoculation. Compounds to be tested are prepared as DMSO solutions (max. 10 mg/mL) which are diluted to the appropriate concentration with 0.025% Tween20 just before spraying. The inoculated leaf disks or segments are
- 10 incubated under defined conditions (temperature, relative humidity, light, etc.) according to the

respective test system. A single evaluation of disease level is carried out 3 to 14 days after inoculation, depending on the pathosystem. Percent disease control relative to the untreated check leaf disks or segments is then calculated.

5 *General examples of liquid culture tests in well plates:*

10 *Mycelia* fragments or conidia suspensions of a fungus prepared either freshly from liquid cultures of the fungus or from cryogenic storage, are directly mixed into nutrient broth. DMSO solutions of the test compound (max. 10 mg/mL) are diluted with 0.025% Tween20 by a factor of 50 and 10 µL of this solution is pipetted into a microtiter plate (96-well format). The nutrient broth containing the fungal spores/mycelia fragments is then added to give an end concentration of the tested compound. The test plates are incubated in the dark at 24°C and 96% relative humidity. The inhibition of fungal growth is determined photometrically after 2 to 7 days, depending on the pathosystem, and percent antifungal activity relative to the untreated check is calculated.

15

Example 1: Fungicidal activity against *Puccinia recondita* f. sp. *tritici* / wheat / leaf disc preventative (Brown rust)

20 Wheat leaf segments cv. Kanzler were placed on agar in multiwell plates (24-well format) and sprayed with the formulated test compound diluted in water. The leaf disks were inoculated with a spore suspension of the fungus 1 day after application. The inoculated leaf segments were incubated at 19°C and 75% relative humidity (rh) under a light regime of 12 hours light / 12 hours darkness in a climate cabinet and the activity of a compound was assessed as percent disease control compared to untreated when an appropriate level of disease damage appears in untreated check leaf segments (7 to 9 days after application).

25

 The following compounds at 200 ppm in the applied formulation give at least 80% disease control in this test when compared to untreated control leaf disks under the same conditions, which show extensive disease development.

30 Compounds (from Table T1) 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 1.10, 1.11, 1.12, 1.13, 1.14, 1.16, 1.17, 1.18, 1.19, 1.21, 1.22, 1.23, 1.24, 1.25, 1.26, 1.30, 1.32, 1.33, 1.34, 1.35, 1.36, 1.37, 1.38, 1.39, 1.40, 1.41, 1.42, 1.43, 1.44, 1.45, 1.46, 1.47, 1.48, 1.49, 1.50, 1.51, 1.52, 1.53, 1.54, 1.55, 1.56, 1.57, 1.58, 1.59, 1.60, 1.61, 1.62, 1.63, 1.64, 1.66, 1.68, 1.70, 1.71, 1.73, 1.79, 1.82, 1.83, 1.84, 1.85, 1.88, 1.91, 1.94, 1.95, 1.96, 1.98, 1.100, 1.101, 1.102, 1.103, 1.105, 1.106, 1.109, 1.113, 1.115, 1.120, 1.122, 1.126, 1.128, 1.129, 1.130, 1.137, 1.140, 1.144, 1.145, 1.149, 1.151, 1.153, 1.155, 1.156, 1.157, 1.158, 1.159, 1.160, 1.161, 1.162, 1.163, 1.164, 1.165, 1.166, 1.167, 1.168, 1.169, 1.176 and 1.177.

35

Example 2: Fungicidal activity against *Puccinia recondita* f. sp. *tritici* / wheat / leaf disc curative (Brown rust)

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Wheat leaf segments cv. Kanzler are placed on agar in multiwell plates (24-well format). The leaf segments are then inoculated with a spore suspension of the fungus. Plates were stored in darkness at 19°C and 75% relative humidity. The formulated test compound diluted in water was applied 1 day after inoculation. The leaf segments were incubated at 19°C and 75% relative humidity under a light regime of 12 hours light / 12 hours darkness in a climate cabinet and the activity of a compound was assessed as percent disease control compared to untreated when an appropriate level of disease damage appears in untreated check leaf segments (6 to 8 days after application).

The following compounds at 200 ppm in the applied formulation give at least 80% disease control in this test when compared to untreated control leaf disks under the same conditions, which show extensive disease development.

Compounds (from Table T1) 1.1, 1.2, 1.4, 1.6, 1.8, 1.9, 1.11, 1.13, 1.14, 1.16, 1.17, 1.19, 1.21, 1.22, 1.23, 1.24, 1.25, 1.30, 1.32, 1.33, 1.34, 1.35, 1.36, 1.37, 1.38, 1.39, 1.40, 1.41, 1.42, 1.43, 1.44, 1.45, 1.46, 1.47, 1.48, 1.49, 1.50, 1.51, 1.52, 1.53, 1.54, 1.55, 1.56, 1.57, 1.58, 1.59, 1.60, 1.61, 1.63, 1.64, 1.66, 1.68, 1.70, 1.73, 1.79, 1.82, 1.83, 1.84, 1.85, 1.88, 1.91, 1.94, 1.95, 1.96, 1.98, 1.100, 1.101, 1.102, 1.103, 1.105, 1.106, 1.109, 1.113, 1.120, 1.122, 1.126, 1.128, 1.129, 1.130, 1.137, 1.140, 1.144, 1.145, 1.151, 1.153, 1.158, 1.160, 1.161, 1.164, 1.166, 1.168, 1.169, 1.176 and 1.177.

Example 3: Fungicidal activity against *Phakopsora pachyrhizi* / soybean / leaf disc preventative (Asian soybean rust)

Soybean leaf disks are placed on water agar in multiwell plates (24-well format) and sprayed with the formulated test compound diluted in water. One day after application leaf discs are inoculated by spraying a spore suspension on the lower leaf surface. After an incubation period in a climate cabinet of 24-36 hours in darkness at 20°C and 75% rh leaf disc are kept at 20°C with 12 h light/day and 75% rh. The activity of a compound is assessed as percent disease control compared to untreated when an appropriate level of disease damage appears in untreated check leaf disks (12 to 14 days after application).

The following compounds at 200 ppm in the applied formulation give at least 80% disease control in this test when compared to untreated control leaf disks under the same conditions, which show extensive disease development.

Compounds (from Table T1) 1.1, 1.4, 1.6, 1.13, 1.14, 1.17, 1.19, 1.21, 1.23, 1.24, 1.25, 1.30, 1.32, 1.33, 1.34, 1.35, 1.38, 1.39, 1.40, 1.41, 1.42, 1.43, 1.44, 1.45, 1.46, 1.47, 1.48, 1.49, 1.50, 1.51, 1.52, 1.53, 1.54, 1.55, 1.56, 1.57, 1.58, 1.59, 1.60 and 1.61.

Example 4: Fungicidal activity against *Glomerella lagenarium* (*Colletotrichum lagenarium*) liquid culture / cucumber / preventative (Anthracnose)

Conidia of the fungus from cryogenic storage are directly mixed into nutrient broth (PDB - potato dextrose broth). After placing a (DMSO) solution of test compound into a microtiter plate (96-well

format), the nutrient broth containing the fungal spores is added. The test plates are incubated at 24°C and the inhibition of growth is measured photometrically 3 to 4 days after application.

The following compounds at 20 ppm in the applied formulation give at least 80% disease control in this test when compared to untreated control under the same conditions, which show extensive disease development.

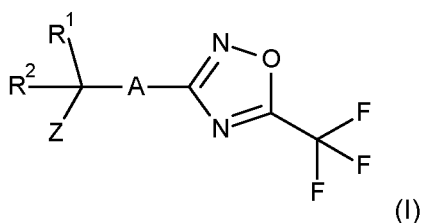
5

10

Compounds (from Table T1) 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 1.10, 1.11, 1.12, 1.13, 1.14, 1.15, 1.16, 1.17, 1.18, 1.19, 1.20, 1.21, 1.22, 1.23, 1.24, 1.25, 1.26, 1.27, 1.28, 1.29, 1.30, 1.31, 1.32, 1.33, 1.34, 1.35, 1.36, 1.37, 1.38, 1.39, 1.40, 1.41, 1.42, 1.43, 1.44, 1.45, 1.46, 1.47, 1.48, 1.49, 1.50, 1.51, 1.52, 1.53, 1.54, 1.55, 1.56, 1.57, 1.59, 1.60, 1.61, 1.62, 1.64, 1.66, 1.68, 1.70, 1.71, 1.73, 1.79, 1.82, 1.84, 1.85, 1.88, 1.91, 1.94, 1.95, 1.96, 1.98, 1.100, 1.101, 1.102, 1.103, 1.105, 1.106, 1.109, 1.115, 1.120, 1.122, 1.126, 1.128, 1.129, 1.130, 1.137, 1.140, 1.144, 1.145, 1.149, 1.151, 1.153, 1.155, 1.156, 1.157, 1.158, 1.159, 1.160, 1.161, 1.162, 1.163, 1.164, 1.165, 1.166, 1.167, 1.168 and 1.169.

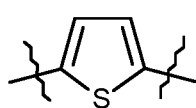
CLAIMS:

1. A compound of Formula (I):

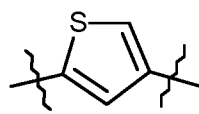


5 wherein

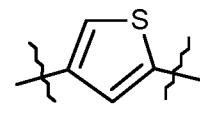
A is selected from A-1, A-2 or A-3;



(A-1)



(A-2)



(A-3)

10

R¹ and R² independently represent hydrogen, methyl, ethyl, fluoro, cyano, difluoromethyl or trifluoromethyl; and

Z is selected from Z¹, Z² or Z³; wherein

15

Z¹ represents a 4- to 6-membered non-aromatic heterocyclyl ring containing 1 ring nitrogen, wherein the heterocyclyl optionally comprises 1 or 2 additional ring members independently selected from N, O, S, C(O) and S(O)₂ with the proviso that the heterocyclyl ring cannot contain 2 contiguous atoms selected from O and S, or the heterocyclyl optionally comprises 1 additional ring member NR³, wherein the heterocyclyl is optionally substituted by 1 or 2 substituents, which may be the same or different, selected from R⁴, and wherein further the heterocyclyl is bound to the rest of the molecule through a ring nitrogen;

20

R³ represents hydrogen, hydroxy, amino, formyl, C₁₋₃alkyl, C₁₋₃alkoxy, C₁₋₃alkylcarbonyl, C₁₋₃alkoxycarbonyl, N-C₁₋₃alkylaminocarbonyl, N,N-diC₁₋₃alkylaminocarbonyl, N-C₁₋₃alkoxyaminocarbonyl, N-C₁₋₃alkyl-N-C₁₋₃alkoxy-aminocarbonyl, C₁₋₂alkylsulfonyl, N-C₁₋₂alkylaminosulfonyl, N,N-diC₁₋₂alkylaminosulfonyl, C₁₋₂alkyldicarbonyl, C₁₋₂alkoxydicarbonyl, N-C₁₋₂alkylaminodicarbonyl or N,N-diC₁₋₂alkylaminodicarbonyl;

25

30

R⁴ represents cyano, halogen, hydroxy, amino, methyl, ethyl, difluoromethyl, trifluoromethyl, methoxy, N-methylamino or N,N-dimethylamino;

Z² represents a 5- or 6-membered heteroaryl ring containing 1 ring nitrogen, wherein the heteroaryl optionally comprises 1, 2 or 3 additional ring members independently selected from O, S, or

N, and wherein the heteroaryl is optionally substituted by: 1 or 2 substituents selected from R⁵, 1 substituent selected from R⁶, or 1 substituent selected from R⁵ and 1 substituent selected from R⁶, and wherein further the heteroaryl is bound to the rest of the molecule through a ring nitrogen;

5 R⁵ represents hydroxyl, amino, cyano, halogen, formyl, nitro, C₁₋₄alkyl, C₁₋₄alkoxy, C₃₋₄alkenyl, C₃₋₄alkynyl, C₃₋₄alkenyloxy, C₃₋₄alkynyloxy, cyanoC₁₋₂alkyl, C₁₋₂haloalkyl, hydroxyC₁₋₂alkyl, C₁₋₂alkoxyC₁₋₂alkyl, C₁₋₂alkoxyC₁₋₂alkoxyC₁₋₂alkyl, N,N-dimethylamino, C₁₋₃alkoxycarbonylC₁₋₂alkyl, C₁₋₃alkylcarbonyloxyC₁₋₂alkyl, N-C₁₋₃alkylaminocarbonylC₁₋₂alkyl, N,N-diC₁₋₃alkylaminocarbonylC₁₋₂alkyl, C₁₋₂alkylsulfonyl, C₁₋₃alkylcarbonyl, C₁₋₃alkyldicarbonyl, C₁₋₃alkoxydicarbonyl, N-C₁₋₃alkylaminodicarbonyl, or N,N-diC₁₋₃alkylaminodicarbonyl; or

R⁵ represents -C(O)N(R^a)(R^b), wherein:

15 R^a represents hydrogen, C₁₋₆alkyl, C₃₋₄alkenyl, C₃₋₄alkynyl, C₁₋₃haloalkyl, C₃₋₄haloalkenyl, C₁₋₄alkoxy, C₁₋₂alkoxyC₁₋₃alkyl, C₂₋₃haloalkoxy, C₃₋₄alkenyloxy, C₃₋₄alkynyloxy, N-C₁₋₃alkylamino, or N,N-diC₁₋₂alkylamino; or

20 R^a represents C₃₋₅cycloalkyl, C₃₋₅cycloalkylC₁₋₂alkyl, phenyl, phenylC₁₋₂alkyl, heterocyclyl, wherein the heterocyclyl moiety is a 4- to 6-membered non-aromatic ring which comprises 1 or 2 heteroatoms independently selected from N, O or S, with the proviso that the heterocyclyl cannot contain 2 contiguous atoms selected from O and S, heteroaryl or heteroarylC₁₋₂alkyl, wherein the heteroaryl moiety is a 5- or 6-membered aromatic ring which comprises 1, 2, 3, or 4 heteroatoms individually selected from N, O and S; wherein the cycloalkyl, phenyl, heterocyclyl or heteroaryl is optionally substituted by 1 or 2 substituents, which may be the same or different, selected from hydroxyl, 25 amino, formyl, acyl, cyano, halogen, methyl, trifluoromethyl, methoxy, or N,N-dimethylamino, and wherein when R^a represents cycloalkyl or heterocyclyl, these cycles optionally contain 1 group selected from C(O) or S(O)₂; and

30 R^b represents hydrogen, methyl, ethyl, propyl, prop-2-enyl, prop-2-ynyl, cyclopropyl, or cyclopropylmethyl; or

R^a and R^b, together with the nitrogen atom they share, form an azetidiny, pyrrolidiny, isooxazolidiny, morpholino, piperazin-4-yl, or piperidiny ring optionally substituted by 1 or 2 groups selected from halogen, methyl, ethyl or methoxy; or

35

R⁵ represents -C(O)O-R^c, wherein:

40 R^c represents hydrogen, C₁₋₆alkyl, C₃₋₅alkenyl, C₃₋₅alkynyl, C₁₋₃haloalkyl, C₃₋₄haloalkenyl, N,N-diC₁₋₃alkylaminoC₁₋₃alkyl, C₃₋₆cycloalkyl, C₃₋₄cycloalkylC₁₋₂alkyl, phenyl, heterocyclyl, wherein the heterocyclyl moiety is a 4- to 6-membered non-aromatic ring which comprises 1 or 2 heteroatoms

independently selected from O, S and N, with the proviso that the heterocyclyl cannot contain 2 contiguous atoms selected from O and S, heteroaryl, wherein the heteroaryl moiety is a 5- or 6-membered aromatic ring which comprises 1, 2 or 3 heteroatoms individually selected from N, O and S; and wherein the cycloalkyl, phenyl, heterocyclyl or heteroaryl is optionally substituted by 1 or 2 substituents, which may be the same or different, selected from hydroxyl, amino, formyl, methylcarbonyl, cyano, halogen, methyl, trifluoromethyl, methoxy, or N,N-dimethylamino, and wherein when R^c represents cycloalkyl or heterocyclyl, these cycles optionally contain 1 group selected from C(O) or S(O)₂; or

10 R⁵ represents -N(R^d)(R^e) or -C₁₋₂alkyl-N(R^d)(R^e), wherein

R^d represents C₁₋₃alkyl, C₃₋₄alkenyl, C₃₋₄alkynyl, methylcarbonyl, methoxycarbonyl, N-methylaminocarbonyl, N,N-dimethylaminocarbonyl, N-methoxyaminocarbonyl, N-methyl-N-methoxyaminocarbonyl, methylsulfonyl, N-methylaminosulfonyl, N,N-dimethylaminosulfonyl, methyldicarbonyl, N-methylaminodicarbonyl, or N,N-dimethylaminodicarbonyl; and

R^e represents hydrogen, methyl, ethyl, or propyl; or

20 R^d and R^e, together with the nitrogen atom they share, form an azetidiny, pyrrolidiny, isooxazolidiny, morpholino, piperazin-4-yl, or piperidiny ring optionally substituted by 1 or 2 groups selected from halogen, methyl, ethyl or methoxy; or

R⁵ represents -CH=N(R^f), wherein R^f represents C₁₋₄alkyl, C₁₋₄alkoxy, C₂₋₄alkenoxy, or C₂₋₄alkynoxy;

25

R⁶ represents C₃₋₆cycloalkyl, phenyl, heteroaryl, wherein the heteroaryl moiety is a 5- or 6-membered aromatic ring which comprises 1, 2, 3 or 4 heteroatoms individually selected from N, O and S, heterocyclyl, wherein the heterocyclyl moiety is a 4- to 6-membered non-aromatic ring which comprises 1 or 2 heteroatoms individually selected from N, O and S, and wherein the cycloalkyl, phenyl, heteroaryl and heterocyclyl is optionally substituted by 1 or 2 substituents, which may be the same or different, selected from hydroxyl, amino, formyl, acyl, cyano, halogen, methyl, trifluoromethyl, methoxy, N,N-dimethylamino, and wherein when R⁶ represents cycloalkyl or heterocyclyl, these cycles optionally contain 1 group selected from C(O) or S(O)₂;

35 and

Z³ represents a heterobicyclyl which is a 7- to 9-membered saturated, partially saturated, or aromatic fused ring or saturated spirocyclic ring system containing 1 nitrogen, wherein the heterobicyclyl optionally comprises 1 or 2 additional ring members independently selected from N, O, S, C(O) and S(O)₂ with the proviso that the heterobicyclyl cannot contain 2 contiguous atoms selected from O and

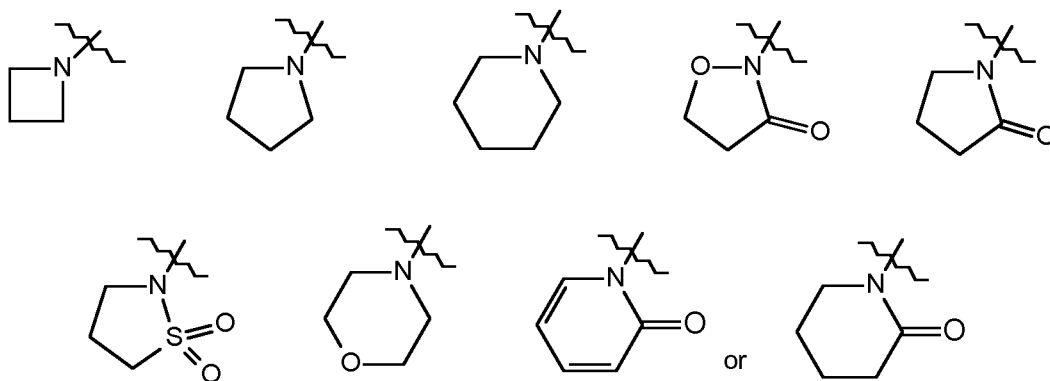
40

S, wherein the heterobicycyl is optionally substituted by 1 substituent selected from R⁷, and wherein further the heterobicycyl is bound to the rest of the molecule through a ring nitrogen; and

R⁷ is cyano, fluoro, chloro, amino, hydroxy, methyl, difluoromethyl, trifluoromethyl, methoxy, N,N-dimethylamino, formyl, methylcarbonyl, methoxycarbonyl, N-methylaminocarbonyl, or N,N-dimethylaminocarbonyl;

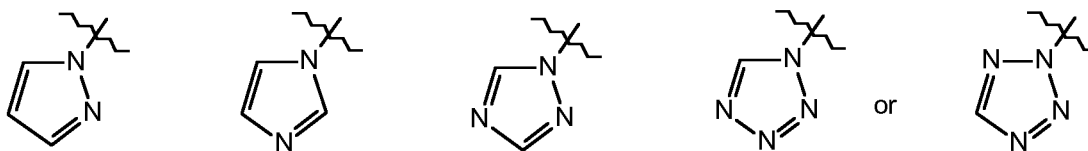
or a salt or N-oxide thereof.

- 10 2. A compound according to claim 1, wherein A is A-1.
3. A compound according to claim 1 or claim 2, wherein R¹ and R² are hydrogen.
4. A compound according to any one of claims 1 to 3, wherein Z is Z¹ selected from:



wherein Z¹ is optionally substituted by 1 or 2 substituents, which may be the same or different, selected from R⁴.

5. A compound according to claim 4, wherein R⁴ is selected from methyl or ethyl.
6. A compound according to any one of claims 1 to 3, wherein Z is Z² selected from:



wherein Z² is optionally substituted by: 1 or 2 substituents selected from R⁵, 1 substituent selected from R⁶, or 1 substituent selected from R⁵ and 1 substituent selected from R⁶.

7. A compound according to claim 6, wherein R⁵ is independently selected from hydroxy, amino, cyano, halogen, formyl, nitro, C₁₋₄alkyl, C₁₋₄alkoxy, C₁₋₂haloalkyl, C₁₋₂alkoxyC₁₋₂alkyl, N,N-dimethylamino, -C(O)O-R^c wherein R^c is C₁₋₄alkyl and -C(O)N(R^a)(R^b), wherein R^a is selected from hydrogen, C₁₋₄alkyl or C₁₋₄alkoxy, and R^b is selected from hydrogen or methyl; and

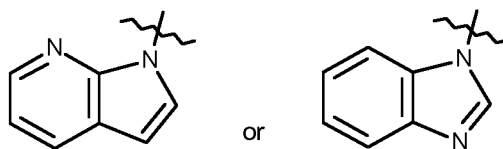
R^6 is phenyl optionally substituted by 1 or 2 substituents, which may be the same or different, selected from hydroxyl, methyl, methoxy, cyano, fluoro, chloro or bromo.

- 5 8. A compound according to claim 7, wherein R^5 is selected from amino, cyano, chloro, fluoro, formyl, nitro, methyl, ethyl, difluoromethyl, methoxymethyl, N,N-dimethylamino, methoxycarbonyl, ethoxycarbonyl or n-propoxycarbonyl; and

10 R^6 is phenyl optionally substituted by 1 or 2 substituents, which may be the same or different, selected from fluoro, chloro or bromo.

9. A compound according to any one of claims 6 to 8, wherein Z^2 is optionally substituted by 1 or 2 substituents selected from R^5 .

- 15 10. A compound according to any one of claims 1 to 3, wherein Z is Z^3 selected from:



wherein Z^3 is optionally substituted by 1 substituent selected from R^7 .

- 20 11. A compound according to claim 10, wherein R^7 is selected from hydroxyl, methoxy, methyl, cyano, fluoro or chloro.

12. An agrochemical composition comprising a fungicidally effective amount of a compound of Formula (I) according to any one of claims 1 to 11.

- 25 13. The composition according to claim 12, further comprising at least one additional active ingredient and/or an agrochemically-acceptable diluent or carrier.

- 30 14. A method of controlling or preventing infestation of useful plants by phytopathogenic microorganisms, wherein a fungicidally effective amount of a compound of Formula (I) according to any one of claims 1 to 11, or a composition comprising this compound as active ingredient, is applied to the plants, to parts thereof or the locus thereof.

15. Use of a compound of Formula (I) according to any one of claims 1 to 11 as a fungicide.

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2018/055042

A. CLASSIFICATION OF SUBJECT MATTER
INV. C07D413/14 A01N43/72 C07D413/04 C07D417/14 C07D471/04
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

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, BIOSIS, CHEM ABS Data, EMBASE, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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A	EP 0 276 432 A2 (CIBA GEIGY AG [CH]) 3 August 1988 (1988-08-03) Formula (I); claims; examples -----	1-15
A	WO 2009/029632 A1 (HELICON THERAPEUTICS INC [US]; KAPLAN ALAN P [US]; KEENAN TERENCE P [U]) 5 March 2009 (2009-03-05) Formula (I); claims; example 10 -----	1-15



Further documents are listed in the continuation of Box C.



See patent family annex.

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

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

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

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

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

"&" document member of the same patent family

Date of the actual completion of the international search

6 April 2018

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2018/055042

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