

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/EP2019/055754

International filing date (day/month/year)
07.03.2019

Priority date (day/month/year)
16.03.2018

International Patent Classification (IPC) or both national classification and IPC
INV. A01N43/38 C07D405/12

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 <i>bis</i> .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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Date of completion of
this opinion

see form
PCT/ISA/210

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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>2, 4-14</u>
	No: Claims	<u>1, 3, 15</u>
Inventive step (IS)	Yes: Claims	<u>2, 4-14</u>
	No: Claims	<u>1, 3, 15</u>
Industrial applicability (IA)	Yes: Claims	<u>1-15</u>
	No: Claims	

2. Citations and explanations

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Reference is made to the following documents:

- D1 WO 2016/193290 A1 (SYNGENTA PARTICIPATIONS AG [CH]) 8 December 2016 (2016-12-08)
- D2 WO 2012/080115 A1 (SYNGENTA PARTICIPATIONS AG [CH]; LACHIA MATHILDE DENISE [CH] ET AL.) 21 June 2012 (2012-06-21)

Re Item V

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

1. Novelty (A. 33(2) PCT)

D1 is considered to be prejudicial to the novelty of claim 1 and claim 3 of present application in view of preparation example 1 of **D1** (IIA-1a, IIA-1b). It is however noted that the novelty-destroying compound of **D1** does not appear to be intended as active ingredient, but as N-protected synthetic precursor.

Claim 15 of present application does not require that the compound of formula (I) is still present after the treatment of the propagation material. In that it is not apparent how a plant propagation material having been treated and then freed of the compound (I) would distinguish itself from just the plant propagation material per se, claim 1 cannot be considered to be novel vis-à-vis the prior art, including **D1**, **D2**.

2. Inventive step (A. 33(3) PCT)

Insofar novel subject-matter of present claims is concerned, it can be considered to imply an inventive step.

In that **D2** (claim 1) includes compounds according present claim 1, it can be taken as closest prior art.

The compounds of present claim 1 comprised in the scope of claim 1 of **D2** can be regarded as the result of multiple selections: namely that both R6 and R7 (= present R1 and R2) need to be methyl or ethyl, that in the polycyclic ring system there are no other nitrogen than present "N-R3" and that the functional groups corresponding to R2 to R5, R8, X and W in claim 1 of **D2** are all limited to one possibility: hydrogen for R2 to R5, R8, X and oxygen for W.

According to present application (page 1, lines 29-31), present derivatives with an obligate N-substituent are more effective on the strigolactone receptor of maize "D14".

This appears to be confirmed by the biological data summarised in tables 2 and 3 (pages 17 to 19) of present application.

In view of this, the objective technical problem underlying the invention can be formulated as being the provision of strigolactone derivatives with improved activity on the strigolactone receptor of maize.

Though **D2** generically includes compounds according to present invention, it does not contain any teaching that would have prompted the skilled person looking for a solution to above stated technical problem to carry out the multiple selections as to the aforementioned functional groups in the generic formula of its claim 1 to arrive to the subject-matter of claim 1.

D1 is not in measure to close this gap. Though it discloses a compound falling within the scope of present claims 1 and 3, this compound appears to be intended as synthetic precursor only and not as active ingredient, especially not as one that would be particularly effective on the strigolactone receptor of maize "D14"..

No other document that would contain a relevant teaching in view of solving the aforementioned technical problem was found.

Re Item VIII

Certain observations on the international application

The following issues contrary to the requirements of clarity and conciseness in the sense of A. 6 PCT have been noted:

According to claims 1, 3, 4, and 6 R3 can be "acetonitrile". Acetonitrile is usually understood to be a compound (solvent) of its own and not a functional group. Should the applicant have intended to designate the group "CH₂-CN" as e.g. used in the examples, the correct naming would be cyanomethyl or nitrilomethyl. The current wording is considered unclear in the sense of A. 6 PCT.

It seems that claim 7 is of the same scope as claim 2 and thus contravenes the requirement of conciseness pursuant A. 6 PCT.