

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.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/EP2024/077982

International filing date (day/month/year)
04.10.2024

Priority date (day/month/year)
04.10.2023

International Patent Classification (IPC) or both national classification and IPC
INV. A01N43/40 A01N43/54 A01P3/00 A01P5/00

Applicant
SYNGENTA CROP PROTECTION 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 43bis.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 66.1bis(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

Authorized Officer

Größl, Sylvester

Telephone No. -0



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 43*bis*.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.
 - b. ☐ furnished subsequent to the international filing date for the purposes of international search (Rule 13*ter*.1(a)),
 - ☐ accompanied by a statement to the effect that the sequence listing does not go beyond the disclosure in the international application as filed.
4. ☐ With regard to any nucleotide and/or amino acid sequence disclosed in the international application, this opinion has been established to the extent that a meaningful opinion could be formed without a WIPO Standard ST.26 compliant sequence listing.
5. Additional comments:
- see separate sheet**

Box No. V Reasoned statement under Rule 43*bis*.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>1-14</u> |
| | No: Claims | |
| Inventive step (IS) | Yes: Claims | <u>1-14</u> |
| | No: Claims | |
| Industrial applicability (IA) | Yes: Claims | <u>1-14</u> |
| | No: Claims | |
2. Citations and explanations
- see separate sheet**

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

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

Re Item I

Basis of the report

(1) The present application is directed to compositions consisting of two fungicides, namely cyclobutrifluram (A-1) and azoxystrobin (B-1), further characterized by the ratio of these two compounds.

(2) The application is further directed to

- a. methods for controlling and preventing (crop) plant infestations by phytopathogenic microorganism (*e.g. Alternaria, Fusarium, Rhizoctonia*) by applying said binary compositions to the plant, its *locus*, or its propagation material (*e.g.* seeds), and
- b. the use of said binary compositions for controlling and preventing such infestations.

Reference is made to the following documents:

D1 AU 2021 255 795 A1 (BAYER AG) 10 November 2022 (2022-11-10)

D2 WO 2022/073797 A1 (BASF SE [DE]) 14 April 2022 (2022-04-14)

D3 WO 2023/072785 A1 (SYNGENTA CROP PROTECTION AG [CH]) 4 May 2023 (2023-05-04)

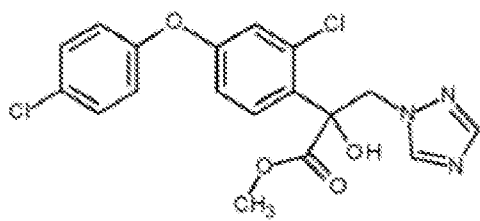
Re Item V

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

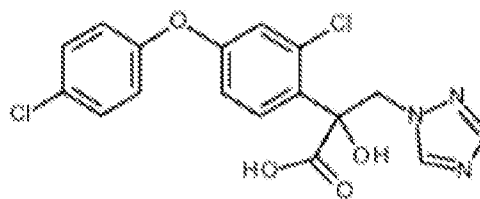
Novelty (Art. 33(2) PCT)

The present application meets the requirements of Art. 33(1) PCT because the subject-matter of claims 1-14 is new in the sense of Art. 33(2) PCT.

(1) Document **D1** discloses various combinations of different fungicidal actives such as explicitly a trinary mixture of compound (I) (description, p. 2, l. 24 to p. 3, l. 6) in combination with both cyclobutrifluram ("2.060") as compound B (description, p. 6, l. 7-9) and azoxystrobin ("3.003") as compound C (description, p. 7, l. 12-13) as one of their most preferred compound combinations "T60", "T-9A" and "T-9A'" in their particularly preferred embodiments (claim 1 and description, p. 24, l. 26-28, p. 26, l. 23-25, p. 28, l. 3-5).



I-1



I-2

However, document **D1** does not disclose any specific ratio between cyclobutrifluram and azoxystrobin.

(2) Document **D2** discloses binary fungicidal mixtures comprising cyclobutrifluram as compound I in combination with another fungicide II (claim 1). Said synergistically active antifungal binary mixtures were tested in different kinds of formulations on both soy and corn showing a synergistic fungicidal effect (description, p. 2, l. 21 to p. 4, l. 1, table).

However, document **D2** does not disclose an example with a combination of cyclobutrifluram with azoxystrobin.

(3) Document **D3** discloses different binary fungicidal mixtures of cyclobutrifluram in combination with phenamacril ("PHM") showing its synergistic effect on *Fusarium proliferatum* (description, p. 28-30, biological examples 1-2, including tables 1-2).

However, document **D3** does not disclose an example with a combination of cyclobutrifluram with azoxystrobin.

Inventive step (Art. 33(3) PCT)

The present application meets the requirements of Art. 33(1) PCT because the subject-matter of claims 1-14 involves an inventive step within the meaning of Art. 33(3) PCT.

(1) The subject-matter of claim 1 is directed to a binary mixture of the two fungicides cyclobutrifluram and azoxystrobin in specific ratios.

Each of prior art documents **D2-D3** may be regarded as being the prior art closest to the subject-matter of present claim 1. These documents disclose synergistic binary fungicidal compositions comprising a) cyclobutrifluram and b) a further fungicide.

The subject-matter of present claim 1 differs in the nature of the additional fungicide.

Directly comparative data has not been provided. The applicant has however demonstrated that a composition comprising cyclobutrifluram and azoxystrobin exhibits a synergistic effect (p. 30-31, tables "results").

The problem to be solved may therefore be regarded as the provision of a further composition comprising cyclobutrifluram and possessing a (synergistically) improved fungicidal effect.

The skilled artisan is generally aware that synergistic effects may not be predicted and come as a surprise to a skilled artisan. Nothing in the prior art would have suggested to the skilled artisan that a combination of cyclobutrifluram and azoxystrobin will exhibit such synergistic antifungal effect. While it has been suggested in document **D1** to combine cyclobutrifluram with azoxystrobin in a ternary composition with compound (I), this document does not provide any hint to such an effect.

Since a synergistic effect has been demonstrated, the subject-matter of present claim 1 may be regarded as involving an inventive step.

(2) The subject-matter of claims 2-7 is directed to methods of controlling or preventing infestations of (crop) plants (*e.g.* cereals like barley, oats and wheat, or soybean, vegetables, *etc.*) by phytopathogenic microorganisms (*e.g.* *Alternaria*, *Fusarium*, *Rhizoctonia* species) by applying said binary fungicide mixture (*e.g.* with a specific weight ratio of compounds A and B, for example of 1:1) to the plant, its locus or its propagation material at a certain application rate (preferably *e.g.* 60-75 g/ha).

As none of the cited prior art documents **D1-D3** gives an incentive for any of these methods specifics, an inventive step shall be acknowledged for the subject-matter of present claims 2-7.

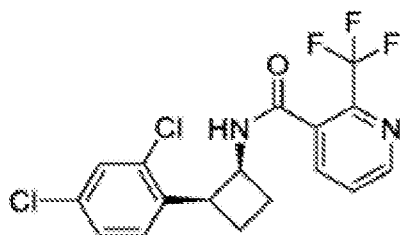
(3) The subject-matter of claim 8 is directed to a composition comprising both azoxystrobin and cyclobutrifluram in a specific ratio suitable for the treatment of (crop) seeds.

An inventive step shall be acknowledged for the subject-matter of present claim 8 as none of the cited prior art documents **D1-D3** gives an incentive for doing so.

(4) The subject-matter of claims 9-11 is again directed to methods of controlling or preventing infestations of (crop) plants by phytopathogenic microorganisms by applying said binary fungicide mixture to plant propagation material, namely seeds at a certain amount of the binary mixture being applied to said seed (most preferably 0.25-0.6 g cyclobutrifluram per kg of seeds and 0.1-0.8 g azoxystrobin per kg of seeds) at a specific application rate (0.002-0.03 mg each of azoxystrobin and cyclobutrifluram per seed).

As none of the cited prior art documents **D1-D3** gives an incentive for any of these methods specifics, an inventive step shall be acknowledged for the subject-matter of present claims 9-11.

(5) The subject-matter of claim 12 is directed to a specific amount (at least 85%, preferably at least 90%) of the *S*-enantiomer of compound A-1a in any of the preceding compositions or methods.



A-1a

An inventive step shall be acknowledged for the subject-matter of present claim 12 as none of the cited prior art documents **D1-D3** gives an incentive for aiming at said specific amount of the *S*-enantiomer.

(6) The subject-matter of claim 13 is directed to coated plant propagation material, wherein said coating comprises said binary fungicidal combination of azoxystrobin and cyclobutrifluram.

An inventive step shall be acknowledged for the subject-matter of present claim 13 as none of the cited prior art documents **D1-D3** gives an incentive for making such a plant propagation material coating therefrom.

(7) The subject-matter of claim 14 is directed to the use of said binary fungicidal composition for the treatment and prevention of plant infestations by phytopathogenic microorganisms (such as the previously stated ones).

An inventive step shall be acknowledged for the subject-matter of present claim 14 as none of the cited prior art documents **D1-D3** gives an incentive for this specific use.

Industrial applicability

The subject-matter of claims 1-14 appears industrially applicable.

Re Item VII

Certain defects in the international application

Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in documents **D1-D3** is not mentioned in the description nor are these documents identified therein.

Re Item VIII

Certain observations on the international application

(1) The subject-matter of present claim 2 is directed to a method comprising “applying [...] a *combination* or composition comprising as component (A), a compound of formula A-1 [...] and, as component (B), a compound of formula B-1”. However, when applied “in any desired sequence” as “a combination” (*i.e.* sequentially), it remains totally unclear whether for example component A is still present when component B is applied or not, and how and/or if this is determined. Therefore, present claim 2 is unclear.

Even in view of the examples it appears that only *compositions* comprising both components have been tested.

(2) Present claim 10 in depending on claim 9 which discloses “...applying to the seed, in any desired sequence or simultaneously, [...] compound of formula A-1 and [...] compound of formula B-1”, which implies a method of applying *both* compounds. However, claim 10 states “...applying to the seed [...] component (A) [...] and/or [...] component B”, which, in the case of “or” would essentially result in taking *only one of both* components, and therefore appears contradictory.

Moreover, it appears that the unit (probably “g” for gram) is missing in present claim 10 in the wording “...per kg of seed and/or 0.001 - 50 of component (B)...”.

(3) Claim 14 is believed to be directed to the use of a composition comprising compounds A-1 and B-1 for the treatment of infestations of a plant by phytopathogenic microorganisms. However, the present claim is contradictory and therefore unclear, since it is currently being formulated in a way that the use of said composition is “for [the] infestation of a plant by phytopathogenic microorganism...”.