

PATENT COOPERATION TREATY

From the:
INTERNATIONAL SEARCHING AUTHORITY

To:

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PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing (*day/month/year*)
18 February 2020

Applicant's or agent's file reference
UPL0008PCT

FOR FURTHER ACTION

See paragraph 2 below

International application No.

PCT/US2019/061135

International filing date (*day/month/year*)

13 November 2019

Priority date (*day/month/year*)

13 November 2018

International Patent Classification (IPC) or both national classification and IPC

A01N 43/88 (2006.01) A01N 43/653 (2006.01) A01N 47/36 (2006.01) A01P 13/02 (2006.01)

Applicant

UPL LIMITED et al.

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 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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AUSTRALIA
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Date of completion of this opinion

18 February 2020

Authorised Officer

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Box No. I Basis of this 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 (under 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(b))
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:

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Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application

☒ claims Nos: **12**

because:

☐ the said international application, or the said claim Nos.

relate to the following subject matter which does not require an international search (*specify*):

the subject matter listed in Rule 67 on which, under Article 34(4)(a)(i), an international preliminary examination [or a written opinion, via the application of Rule 43bis.1(b)], is not required to be carried out, including

☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos.
are so unclear that no meaningful opinion could be formed (*specify*):

☐ the claims, or said claims Nos.
are so inadequately supported by the description that no meaningful opinion could be formed (*specify*):

☒ no international search report has been established for said claims Nos. **12**

☐ a meaningful opinion could not be formed without the sequence listing; the applicant did not, within the prescribed time limit:

☐ furnish a sequence listing in the form of an Annex C/ST.25 text file, and such listing was not available to the International Searching Authority in a form and manner acceptable to it; or the sequence listing furnished did not comply with the standard provided for in Annex C of the Administrative Instructions.

☐ furnish a sequence listing on paper or in the form of an image file complying with the standard provided for in Annex C of the Administrative Instructions, and such listing was not available to the International Searching Authority in a form and manner acceptable to it; or the sequence listing furnished did not comply with the standard provided for in Annex C of the Administrative Instructions.

☐ pay the required late furnishing fee for the furnishing of a sequence listing in response to an invitation under Rule 13ter.1(a) or (b).

☐ See Supplemental Box for further details.

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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 <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%; vertical-align: top;"> Novelty (N) </td> <td style="width: 40%; vertical-align: top;"> Claims NONE Claims 1-11 & 13-18 </td> <td style="width: 30%; vertical-align: top; text-align: center;"> YES NO </td> </tr> <tr> <td style="vertical-align: top;"> Inventive step (IS) </td> <td style="vertical-align: top;"> Claims NONE Claims 1-11 & 13-18 </td> <td style="vertical-align: top; text-align: center;"> YES NO </td> </tr> <tr> <td style="vertical-align: top;"> Industrial applicability (IA) </td> <td style="vertical-align: top;"> Claims 1-11 & 13-18 Claims NONE </td> <td style="vertical-align: top; text-align: center;"> YES NO </td> </tr> </table>			Novelty (N)	Claims NONE Claims 1-11 & 13-18	YES NO	Inventive step (IS)	Claims NONE Claims 1-11 & 13-18	YES NO	Industrial applicability (IA)	Claims 1-11 & 13-18 Claims NONE	YES NO
Novelty (N)	Claims NONE Claims 1-11 & 13-18	YES NO									
Inventive step (IS)	Claims NONE Claims 1-11 & 13-18	YES NO									
Industrial applicability (IA)	Claims 1-11 & 13-18 Claims NONE	YES NO									
2. CITATIONS AND EXPLANATIONS: <u>CITATIONS</u> D1: CN 105994331 A (HENAN ZHONG TIAN HENG XIN BIOCHEMICAL TECH CO LTD) 12 October 2016 D2: WO 2000/027203 A1 (NOVARTIS AG) 18 May 2000 D3: SOLTANI, N. <i>et al.</i>, "Weed management in white beans with postemergence herbicide tankmixes", <i>Canadian Journal of Plant Science</i> (2013) vol 93, pages 669-674. D4: WO 2014/013998 A1 (NIHON NOHYAKU CO., LTD.) 23 January 2014 D5: WO 2016/116531 A1 (BASF AGRO B.V.) 28 July 2016 D6: CN 108651490 A (BEIJING KEFA WEIYE PESTICIDE TECH CT) 16 October 2018 D7: WO 2009/141367 A2 (BASF SE) 26 November 2009 D8: BLUM, R. R. <i>et al.</i>, "Purple (<i>Cyperus rotundus</i>) and Yellow Nutsedge (<i>C. esculentus</i>) Control in Bermudagrass (<i>Cynodon dactylon</i>) Turf", <i>Weed Technology</i> (2000) vol 14, pages 357-365. D9: TAZIAR, A. N. <i>et al.</i>, "Sulfentrazone plus a Low Rate of Halosulfuron for Weed Control in White Bean (<i>Phaseolus vulgaris</i> L.)", <i>Agricultural Sciences</i> (2017) vol 8, pages 227-238. <u>NOVELTY (N)</u> Claims 1-11 & 13-18 are not novel and therefore do not comply with PCT Article 33(2). <i>Construction Note: A "combination" as presently claimed is not considered to be limited to agents mixed together in a composition or individual agents when used simultaneously or sequentially, but is considered to encompass the disclosure of agents in any proximity in the prior art.</i> <i>It is further noted that many of the herbicides presently claimed simultaneously belong to more than one of the defined categories. For instance, sulfentrazone and halosulfuron act as both acetolactate synthase (ALS) inhibitors and chlorophyll and heme biosynthesis (C&HB) inhibitors.</i> D1 (HENAN ZHONG TIAN HENG XIN BIOCHEMICAL TECH CO LTD)discloses a herbicidal composition, for controlling weeds in crops, comprising pendimethalin, sulfentrazone, bentazone, clethodim and halosulfuron-methyl. It is noted that weed control is considered to inevitably increase crop yield and improve crop plant health as presently defined in claims 17-18. See: Abstract (<i>based on English machine translation obtained from Espacenet, 11 FEB 2020</i>). Consequently, claims 1-11 & 14-18 lack novelty over D1. D2 (NOVARTIS AG)discloses a number of binary herbicidal compositions for use in crops such as maize or rice, including the specifically identified binary compositions of sulfentrazone with one of bentazone or halosulfuron. Ternary & quaternary compositions of the active ingredients disclosed therein are also contemplated. See: p9 par 5 & p18 ln 15-16, p66 par 2 & p72 ln 7, p107 par 2, p147 ln 8 & 11, Claims 5, 8, 12 & 19-20. Consequently, claims 1-11 & 13-18 lack novelty over D2. D3 (SOLTANI <i>et al.</i>) discloses a binary composition comprising bentazone and halosulfuron, used for controlling weeds in white bean crops. A ternary composition further comprising fomesafen, a protoporphyrinogen oxidase inhibitor (which inhibits											

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chlorophyll & heme biosynthesis). See: Abstract, Table 1, p670 col 1 par 2-4. Consequently, claims 1-7, 10 & 14-18 lack novelty over **D3**.

D4 (NIHON NOHYAKU CO., LTD.) discloses a binary herbicidal composition for use in the cultivation of crops, comprising a protoporphyrinogen oxidase inhibitor (i.e. a C&HB inhibitor, e.g. pyraflufen-ethyl, sulfentrazone) and a photosynthesis inhibitor (e.g. bentazone, bentazone-sodium). See: Abstract, Examples (*based on English machine translation obtained from Google Patents, 11 FEB 2020*). Consequently, claims 1-11 & 14-18 lack novelty over **D4**.

D5 (BASF AGRO B.V.) discloses ternary herbicidal compositions falling within the scope of the claims, such as compositions comprising saflufenacil, sulfentrazone and one of imazethapyr, imazamox, diclosulam, atrazine or flumioxazin. It is noted that these compositions are registered under CAS numbers 1973389-87-5, 1973389-85-3, 1973389-81-9, 1973389-80-8 & 1973389-75-1, respectively. Furthermore, a combination comprising saflufenacil, sulfentrazone and a photosystem II (PSII) inhibitor selected from bentazone is also disclosed. See: Table 1 (No 1 & 8-11), claims 1 & 7. Consequently, claims 1-11 & 14-18 lack novelty over **D5**.

D6 (BEIJING KEFA WEIYE PESTICIDE TECH CT) discloses a synergistic herbicidal composition comprising diclosulam, metribuzin and as a further active ingredient, sulfentrazone, which is registered under CAS number 225117-52-7. The further active ingredient may alternatively be selected from imazethapyr or bentazone. See: Abstract (*based on English machine translation obtained from Espacenet, 05 FEB 2020*). Consequently, claims 1-11 & 14-18 lack novelty over **D6**.

D7 (BASF SE) discloses a number of multi-component herbicidal compositions which fall within the scope of the present claims. For example, four compositions are disclosed that comprise sulfentrazone, hexazinone and diuron, as well as 2-3 further active agents, and these compositions are registered under CAS numbers 1197022-28-8, 1197022-04-0, 1197018-20-4 & 1197017-99-4. It is noted that bentazone is listed as a potential alternative PSII inhibitor and halosulfuron is listed as a potential alternative ALS inhibitor. See: Table 1 (No 298, 320, 591 & 612), p7 ln 25-28, p36 ln 13-14. Consequently, claims 1-11 & 13-18 lack novelty over **D7**.

D8 (BLUM *et al.*) discloses an experimental field study for the control of nutsedge weeds in turf, comprising the testing of single or double applications of one of bentazone, halosulfuron or sulfentrazone. See: Abstract, Table 3. Consequently, claims 1-11 & 13-14 lack novelty over **D8**.

D9 (TAZIAR *et al.*) discloses tank-mix compositions comprising sulfentrazone and halosulfuron for the control of broadleaf weeds in crops. See: Abstract, Tables 1-6, Conclusion. However, **D9** does not disclose a photosystem II inhibitor herbicide as presently claimed.

It is noted that the presently claimed herbicides are commonly known in the art, and **D1-D9** discussed *supra* are considered to be mere examples selected from many in a well-traversed art.

INVENTIVE STEP (IS)

Claims 1-11 & 13-18 do not meet the requirements of Article 33(3) of the PCT with regard to inventive step.

The problem to be solved by the present invention is the need for new and/or alternative herbicidal combinations and compositions (see present description [0007-0008]).

Claims 1-11 & 13-18 lack novelty over at least one of **D1-D8** as previously discussed, and thereby also do not meet the criteria of Article 33(3) of the PCT, and thus lack an inventive step.

INDUSTRIAL APPLICABILITY (IA)

The invention defined by claims 1-11 & 13-18 is considered to meet the requirements of Industrial Applicability under Article 33(4) of the PCT because it can be made by, or used in, industry.

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Box No. VII Certain defects in the international application

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

Claim 12 does not comply with Rule 6.2(a) because it relies on references to the description ("...at least three herbicides listed as combinations in 1 - 2550 of table 1").

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Box No. VIII Certain observations on the international application

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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:

Clarity

Claim 16 is unclear because there is no antecedent for "The composition" when appended to claim 1, which defines a combination. For the purposes of this Opinion, claim 16 is considered to intend to read "The combination".