

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference MONS:510WO		FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. PCT/US22/78966	International filing date (day/month/year) 31 October 2022 (31.10.2022)	(Earliest) Priority Date (day/month/year) 02 November 2021 (02.11.2021)	
Applicant MONSANTO TECHNOLOGY LLC			

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 6 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 43.6bis(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. 2

☐ 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.

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Box No. I Nucleotide and/or amino acid sequence(s) (Continuation of item 1.c of the first sheet)

1. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out 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 13ter.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.
2. ☐ With regard to any nucleotide and/or amino acid sequence disclosed in the international application, this report has been established to the extent that a meaningful search could be carried out without a WIPO Standard ST.26 compliant sequence listing.
3. Additional comments:

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

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

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☒ Claims Nos.: 4-6, 18-19, 21-23
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

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

This International Searching Authority found multiple inventions in this international application, as follows:
-***-Please See Supplemental Page-***-

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.
3. ☒ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
1st Invention: Claims 1-3, 7-17, 20, and 24-47, SEQ ID NO: 1 (nucleotide sequence associated with corn event ZM_BCS216090).
2nd Invention: Claims 1-3, 7-17, 20, and 24-47, SEQ ID NO: 2 (nucleotide sequence associated with corn event ZM_BCS216090).
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☒ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

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A. CLASSIFICATION OF SUBJECT MATTER

IPC - INV. C12N 15/82; C12Q 1/6888 (2023.01)

ADD. C12N 15/10 (2023.01)

CPC - INV. C12N 15/82; C12Q 1/6888

ADD. C12N 15/10

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)

See Search History document

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

See Search History document

Electronic database consulted during the international search (name of database and, where practicable, search terms used)

See Search History document

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2015/0240253 A1 (E. I. DU PONT DE NEMOURS AND COMPANY) 27 August 2015; paragraphs [0009], [0018]	1st Invention: 1-3, 10, 12, 14-17, 24, 29-35
A	US 2020/0032289 A1 (MONSANTO TECHNOLOGY LLC) 30 January 2020; paragraphs [0007], [0010], [0011], [0014], [0016], [0019], [0020], [0021], [0058], [0060], [0093], [0100], [0103], [0111], [0113], Claim 15	Both Inventions: 7-13, 20, 24-29, 36-47
A	US 2021/0332380 A1 (MONSANTO TECHNOLOGY LLC) 28 October 2021; paragraphs [0007], [0010], [0011], [0012], [0013], [0014], [0016], [0020], [0021], [0062], [0098], [0103], [0106], [0108], [0109], [0111], [0117], [0155] Table 14, claim 21	Both Inventions: 7-13, 20, 24-28, 36-47
A	CN 104388580 A (OIL CROPS RES INST CAAS) 04 March 2015; paragraphs [0110], [0113]	Both Inventions: 7-9, 11, 13, 20, 25-28, 36-47
A	BOWLER, C ET AL. "Phaeodactylum tricornutum CCAP 1055/1 predicted protein partial mRNA" Genbank entry (online). National Center for Biotechnology Information. 16 June 2017; [Retrieved 01 January 2023] Retrieved from the Internet: <URL: https://www.ncbi.nlm.nih.gov/nucleotide/XM_002181742.1 >	1st Invention: 1-3, 14-17, 29-35
A	CACCONI, A ET AL. "Drosophila yakuba nullo gene, partial cds" Genbank entry (online). National Center for Biotechnology Information. 08 February 1997; [Retrieved 01 January 2023] Retrieved from the Internet: <URL: https://www.ncbi.nlm.nih.gov/nucleotide/U44732.1 >	1st Invention: 1-3, 14-17, 30-35
A	MURAMATSU, K ET AL. "Drosophila melanogaster DNA, chromosome 2R, 43A1, GS vector insertion site flanking region, clone: 14174-5p-6.seq" Genbank entry (online). National Center	2nd Invention: 1-3, 14-17, 30-35

☒ 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

"D" document cited by the applicant in the international application

"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

13 April 2023 (13.04.2023)

Date of mailing of the international search report

MAY 04 2023

Name and mailing address of the ISA/

Mail Stop PCT, Attn: ISA/US, Commissioner for Patents

P.O. Box 1450, Alexandria, Virginia 22313-1450

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	for Biotechnology Information. 13 June 2007; [Retrieved 13 April 2023] Retrieved from the Internet: <URL: https://www.ncbi.nlm.nih.gov/nucleotide/AB317463.1 > — NATIONAL CENTER FOR BIOTECHNOLOGY INFORMATION. "PREDICTED: Alligator mississippiensis LSM5 homolog, U6 small nuclear RNA and mRNA degradation associated (LSM5), mRNA" Genbank entry (online). 09 December 1016; [Retrieved 13 April 2023] Retrieved from the Internet: <URL: https://www.ncbi.nlm.nih.gov/nuccore/XM_006258198.3 >	2nd Invention: 1-3, 14-17, 30-35
A	US 2014/0230087 A1 (HARTIG, JV et al.) 14 August 2014; paragraphs [0010], [0030]	2nd Invention: 1-3, 7-17, 20, 24-47

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-Continued From Box No. III: Observations where unity of invention is lacking-

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Groups I+, claims 1-3, 7-17, 20, and 24-47, SEQ ID NO: 1 (nucleotide sequence associated with corn event ZM_BCS216090), are directed to recombinant DNA molecules, DNA probes and primers, methods and kits for detecting DNA molecules related to corn event ZM_BCS216090, methods of producing hybrid progeny corn plants comprising corn event ZM_BCS216090, said hybrid corn plants or seeds, and products and methods related to said plants or seeds.

The molecules, kits, plants, seeds, and methods of Claims 1-3, (each in-part), 7, 8-10 (each in-part), 11, 12-17 (each in-part), 20, 24 (in-part), 25-28, 29 (in-part), and 30-47 are believed to encompass the first named invention of Groups I+ and are the claims that will be searched to the extent that they comprise a nucleotide sequence encompassing SEQ ID NO: 1 (first exemplary nucleotide sequence associated with corn event ZM_BCS216090). This first named invention of Group I+ has been selected to encompass the first species of the genus found in claims 1, 8, 10, 12-14, 24, and 29 based on the guidance set forth in section 10.54 of the PCT International Search and Preliminary Examination Guidelines.

Applicant is invited to elect additional nucleotide sequences associated with corn event ZM_BCS216090, with specified SEQ ID NO: for each, or with specified substitution(s) at specified site(s) of a SEQ ID NO:, such that the sequence of each elected species is fully specified (i.e. no optional or variable residues or substituents), and where available as an option within at least one searchable claim, to be searched. Additional sequence(s) will be searched upon the payment of additional fees. Applicants must specify the searchable claims that encompass any additionally elected sequence(s). Applicants must further indicate, if applicable, the claims which encompass the first named invention, if different than what was indicated above for this group. Failure to clearly identify how any paid additional invention fees are to be applied to the "+" group(s) will result in only the first claimed invention to be searched/examined. An exemplary election would be SEQ ID NO: 2 (nucleotide sequence associated with corn event ZM_BCS216090).

No technical features are shared between the nucleotide sequences associated with corn event ZM_BCS216090 of Groups I+ and, accordingly, these groups lack unity a priori.