

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
27 December 2007 (27.12.2007)

PCT

(10) International Publication Number
WO 2007/149069 A3

(51) International Patent Classification:

A01H 5/00 (2006.01) C12N 15/82 (2006.01)
C12N 15/29 (2006.01)

(21) International Application Number:

PCT/US2006/023247

(22) International Filing Date: 15 June 2006 (15.06.2006)

(25) Filing Language: English

(26) Publication Language: English

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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SY, 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, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

- with international search report
- with sequence listing part of description published separately in electronic form and available upon request from the International Bureau

(88) Date of publication of the international search report:
23 April 2009

(54) Title: RESISTANCE TO ACETOLACTATE SYNTHASE-INHIBITING HERBICIDES

(57) Abstract: Nucleotide sequences are disclosed that may be used to impart herbicide resistance to green plants. The sources of novel herbicide resistance were originally isolated in mutant *Coreopsis* plants. Green plants transformed with these sequences are resistant to herbicides that normally inhibit acetolactate synthase (ALS), particularly imidazolinone and sulfonyleurea herbicides.



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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US06/23247

A. CLASSIFICATION OF SUBJECT MATTER

IPC: A01H 5/00(2006.01);C12N 15/29(2006.01),15/82(2006.01)
C12N 15/10(2006.01),15/52(2006.01)

USPC: 435/320.1;536/23.6;800/278,300

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)

U.S. : 435/320.1;536/23.6;800/278,300

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)

Please See Continuation Sheet

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JANDER, G. et al. Ethylmethanesulfonate saturation mutagenesis in Arabidopsis to determine frequency of herbicide resistance. Plant Physiology January 2003, Vol. 131, pages 139-146, see entire document.	2,7,9-15,17,18,20-26,28,33,35-42,59 and 65-71
Y	HATTORI, J. et al. Multiple resistance to sulfonylureas and imidazolinones conferred by an acetohydroxyacid synthase gene with separate mutations for selective resistance. Molecular and General Genetics 1992, Vol. 232, pages 167-173, see entire document.	2,7,9-15,17,18,20-26,28,33,35-42,59 and 65-71
Y	TRANEL, P.J. et al. Resistance of weeds to ALS-inhibiting herbicides: what have we learned? Weed Science November-December 2002, Vol. 50, pages 700-712, see entire document.	2,7,9-15,17,18,20-26,28,33,35-42,59 and 65-71

☐ 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 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

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"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

18 June 2008 (18.06.2008)

Date of mailing of the international search report

22 AUG 2008

Name and mailing address of the ISA/US

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US06/23247

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.: 1,3-6,8,16,18,27,29-32,34,58,60-62 and 64
because they relate to subject matter not required to be searched by this Authority, namely:
The claims are directed to products of nature.
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.:
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:

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 any 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.:
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.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US06/23247

Continuation of B. FIELDS SEARCHED Item 3:
EAST:USPAT,USPGPU,EPO,JPO,DERWENT
STN:AGRICOLA, BIOSIS, CAPLUS, EMBASE
Sequeunce Search of SEQ ID NO: 13