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Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for all designations
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for all designations
- of inventorship (Rule 4.17(iv)) for US only

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

(57) Abstract: Nucleotide sequences are disclosed that may be used to impart herbicide resistance to green plants. The sources of novel resistance were originally isolated in mutant rice plants. The sequences impart pre-emergence resistance, post-emergence resistance, or both pre-emergence resistance and post-emergence resistance to multiple herbicides. To date, resistance has been demonstrated against at least the following herbicides: imazethapyr, imazapic, imazapyr, imazamox, sulfometuron methyl, imazaquin, chlorimuron ethyl, metsulfuron methyl, rimsulfuron, thifensulfuron methyl, pyriithiobac sodium, tribenuron methyl, and nicosulfuron. Green plants transformed with these sequences are resistant to these herbicides and to derivatives of these herbicides, and to at least some of the other herbicides that normally inhibit acetohydroxyacid synthase (AHAS), particularly imidazolinone and sulfonylurea herbicides.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 01/15072

A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 C12N15/82 C12N9/88 A01H1/00 A01H5/10

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)

IPC 7 C12N A01H

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 practical, search terms used)

EPO-Internal, SEQUENCE SEARCH, WPI Data, PAJ, BIOSIS, FSTA, CAB Data, SCISEARCH, BIOTECHNOLOGY ABS, CHEM ABS Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P, X	WO 00 27182 A (UNIV LOUISIANA STATE (US)) 18 May 2000 (2000-05-18) cited in the application the whole document	37-69
X	WO 97 41218 A (UNIV LOUISIANA STATE) 6 November 1997 (1997-11-06) cited in the application	14, 16, 34, 36, 52, 54, 67, 69-81, 101, 104, 122, 125, 142, 145
Y	page 9, line 31 -page 11, line 25; claims 10-18	1, 17, 37, 55
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Further documents are listed in the continuation of box C.

Patent family members are listed in 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 document 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.
- *Z* document member of the same patent family

Date of the actual completion of the international search

26 April 2002

Date of mailing of the international search report

07/05/2002

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INTERNATIONAL SEARCH REPORT

International Application No

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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.
Y	<p>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, SPRINGER VERLAG, BERLIN, DE, vol. 232, 1992, pages 167-173, XP002056388 ISSN: 0026-8925 the whole document</p>	<p>1,17,37, 55</p>
A	<p>OTT ET AL: "rational molecular design and genetic engineering of herbicide resistant crops by structure modelling and site-directed mutagenesis of acetohydroxyacid synthase" JOURNAL OF MOLECULAR BIOLOGY, LONDON, GB, vol. 263, 1996, pages 359-368, XP002118465 ISSN: 0022-2836 page 362 -page 363</p>	<p>98,100, 103,119, 121,124, 141,144</p>
A	<p>US 5 767 366 A (MURAI NORIMOTO ET AL) 16 June 1998 (1998-06-16) cited in the application the whole document</p>	<p>1-14</p>

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.2

Claims Nos.: 1-145, all partially

In view of the large number and also the wording of the claims presently on file, which render it difficult, if not impossible, to determine the matter for which protection is sought, the present application fails to comply with the clarity and conciseness requirements of Article 6 PCT (see also Rule 6.1(a) PCT) to such an extent that a meaningful search is impossible. Consequently, the search has been carried out for those parts of the application which do appear to be clear (and concise), namely the putative invention as described on page 12, line 28 to page 13, line 33, i.e. rice (*Oryza sativa*) acetohydroxyacid synthase (AHAS) nucleic acids which confer herbicide resistance to green plants and in which the serine molecule at position 627 has been replaced by respectively asparagine, glutamine, glutamic acid, aspartic acid, lysine, arginine or histidine, as well as vectors, hosts, nucleic acid constructs and transgenic plants comprising said nucleic acids.

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.

INTERNATIONAL SEARCH REPORT

information on patent family members

Inter. Patent Application No

PCT/US 01/15072

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 0027182	A	18-05-2000	AU 1342400	A 29-05-2000
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