



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<b>(51) International Patent Classification<sup>5</sup> :</b> <b>C12N 15/82, 9/10, 9/12</b> <b>A01H 5/00</b>	<b>A3</b>	<b>(11) International Publication Number:</b> <b>WO 94/11520</b> <b>(43) International Publication Date:</b> 26 May 1994 (26.05.94)
<b>(21) International Application Number:</b> PCT/GB93/02305 <b>(22) International Filing Date:</b> 9 November 1993 (09.11.93) <b>(30) Priority data:</b> 9223454.1                      9 November 1992 (09.11.92)    GB <b>(71) Applicant (for all designated States except US):</b> ZENECA LIMITED [GB/GB]; Imperial Chemical House, 9 Millbank, London SW1P 3JF (GB). <b>(72) Inventor; and</b> <b>(75) Inventor/Applicant (for US only) :</b> KEELING, Peter, Lewis [GB/GB]; 3409 Oakland Street, Ames, IA 50010 (GB). <b>(74) Agent:</b> HUSKISSON, Frank, Mackie; Group Patent Services Department, Imperial Chemical Industries plc, P.O. Box 6, Bessemer Road, Welwyn Garden City, Herts AL7 1HD (GB).		<b>(81) Designated States:</b> AU, BB, BG, BR, BY, CA, CZ, FI, HU, JP, KP, KR, KZ, LK, LV, MG, MN, MW, NO, NZ, PL, RO, RU, SD, SK, UA, US, VN, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).  <b>Published</b> <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>  <b>(88) Date of publication of the international search report:</b> 4 August 1994 (04.08.94)
<b>(54) Title:</b> NOVEL PLANTS AND PROCESSES FOR OBTAINING THEM		
<b>(57) Abstract</b>  <p>A method of producing a plant with switchable starch-synthesising ability comprises stably incorporating into the genome of a recipient plant at least one target gene encoding an enzyme involved in a starch or glycogen biosynthetic pathway and under the control of a gene switch. A plant with switchable starch-synthesising ability may have switchable starch yield, and/or switchable starch quality. Starch or glycogen biosynthetic enzymes include soluble starch synthase, branching enzyme, glycogen synthase, ADP-glucose pyrophosphorylase, self-glucosylating protein, glycogenin and amylogenin. DNA constructs for use in this method are described, as well as plants transformed with said DNA constructs, the seeds and progeny of such plants, and hybrids whose pedigree includes such plants.</p>		

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## A. CLASSIFICATION OF SUBJECT MATTER

IPC 5 C12N15/82 C12N9/10 C12N9/12 A01H5/00

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 5 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)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO,A,92 11382 (CALGENE) 9 July 1992	1, 2, 4, 7, 11, 13, 16, 20, 21
Y	see examples 4,6	1, 2, 4, 7, 11, 13, 16, 20, 21
X	WO,A,92 14827 (INSTITUT FÜR GENBIOLOGISCHE FORSCHUNG BERLIN) 3 September 1992	6
Y	see the whole document	6, 14
X	WO,A,91 19806 (MONSANTO) 26 December 1991	3, 4, 8, 15, 17, 26, 27
Y	see examples 3,4,6	3, 4, 8, 15-17, 26, 27, 35
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 Further documents are listed in the continuation of box C. Patent family members are listed in annex.

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- \*&\* document member of the same patent family

Date of the actual completion of the international search

1 March 1994

Date of mailing of the international search report

24. 06. 94

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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.
X	WO,A,92 11376 (AMYLOGENE) 9 July 1992	12
Y	see the whole document ---	12
X	WO,A,92 11375 (AMYLOGENE) 9 July 1992	4
Y	see the whole document ---	4
X	THE PLANT CELL, vol.3, no.10, October 1991 pages 1121 - 1130 RORRELL, A.C., ET AL. 'Expression of a maize sucrose phosphate synthase in tomato alters leaf carbohydrate partitioning'	26,27
Y	see the whole document ---	26,27
X	THE PLANT CELL, vol.1, no.4, April 1989 pages 403 - 413 MEDFORD, J.I., ET AL. 'Alterations in endogenous cytokinins in transgenic plants using a chimeric isopentenyl transferase gene'	31-33
X	see the whole document ---	
X	EP,A,0 438 904 (ADVANCED TECHNOLOGIES) 31 July 1991 see the whole document ---	4,17
P,X	WO,A,93 09237 (SANDOZ) 13 May 1993	1-4,8, 13,16, 17, 22-25, 35-37
Y	see claims 1-20; example 9 ---	
Y	EP,A,0 388 186 (DU PONT) 19 September 1990	1-4,6-8, 11-17, 19-21, 26,27,35
Y	see page 10, line 46 ---	
Y	EP,A,0 455 316 (INSTITUT FÜR GENBIOLOGISCHE FORSCHUNG BERLIN) 6 November 1991 see the whole document ---	3,8,14
Y	WO,A,90 08826 (ICI) 9 August 1990 see the whole document ---	17,19
A	PLANT MOLECULAR BIOLOGY, vol.14, 1990 pages 995 - 1006 JEFFERSON, R., ET AL. 'Transcriptional regulation of a patatin-1 gene in potato' see the whole document -----	17

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/GB93/02305

**Box I Observations where certain claims were found unsearchable (Continuation of item 1 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.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

**Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)**

This International Searching Authority found multiple inventions in this international application, as follows:

- 1.- claims 1-33,35-37: Provision of plants with switchable starch synthesising capability.
- 2.- claim 34: Provision of plants with switchable oil synthesising capability.

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 an additional fee, this Authority did not invite payment of any additional fee.
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.:

1-33, 35-37

Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
- No protest accompanied the payment of additional search fees.

## INTERNATIONAL SEARCH REPORT

information on patent family members

International Application No

PCT/GB 93/02305

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