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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Offlee

February 26, 2008

THIS IS TO CERTIFY THAT ANNEXED IS A TRUE COPY FROM THE RECORDS OF THIS OFFICE OF A DOCUMENT RECORDED ON March 02,2006.

By Authority of the
Under Secretary of Commerce for Intellectual Property
and Director of the United States Patent and Trademark Office

Z?o.v - J? --,
W.

L.EDELEN

Certifying Officer

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A’S 14:15 F r om-MONSANTO + T-01$ P - 004/007 F-630

Attorney Docket No. &2_1-(L22_0_5j

ASSIGNMEENT

WHEREAS, WE, the undersigned, have made, and have an obligation to assign to Monsanto Technology LLC, catain invention or inventions which we disclosed in patent application(s) and/or provisional pment applicati.ori(s) entitled:
NucleotLdeSecuences-En diar.InsectioidaIPr-Oleins

identified as JJAS. Sg?jLal No. 60n 13,144 and filed on August 31-205 and

WHEPXAS, Monsanto Technology LLC, of St. Louis, NEssouri, a CoTporation of the State of Delaware, is desiroO

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s of acquiring the entire right, title and interest in and to said invention or
inventions and any and all patents to be obtained dwrefOT;

NOW, THEWORE, FOR GOOD AND VALUABLE CONSIDERATION, the receipt of which is hereby acknowledged, WE do hereby sell, assign and transfer to Wd Monsanto Technology LLC, its successors and assigns, the entire right, title and interest in and to said invention or inventions, in any form or embodiment thereof, and in and to said application(s); and in and to any and all applications filed in any coantry based thereon, including the, right to file applications in countries other than the country of priority filing under the provisions of any international convention; also inj, and to any and all improvements on said invention or inventions now or hereaftei made by us as employee(s), agenT(s) or contractor(s) of said Monsanto Technology LLQ also the entiro right, title and interest in and to any and all patents, including reissues and extensions thereof, to be obtained in any country upon said invention, inventions or improvements, and, any and all continuing applications, including divisional, continuation and continuation-in-part applications, substitute applications, and applications claiming benefit of an earlier filed provisional application, which may be filed upon said invention, inventions or improvements in any country; and

WE hereby authozize and request the issuing authority to issue any and all patents on said application or appOcations to said Monsanto Technology LLC, as assignee of tile entire interest.

WE further agree, without any p"ent by Moumnto Technology LLC oft. r th4n in reimbursement of, reasonable expenses we may incur, to communicate to said Monsanto Technology LIC, its mprescntiaives, agents or assignees of the entire right, title and interest hereto, any facts relating to said invention, inventions or improvements, including evidence for pwposes of interference, opposition or other legal proceedings, whenever requested; testify in any interference, opposition or other legal proceedings, whenever requested; and execute and
deliver, on reques all lawful papers required to make any of the foregoing provisions effective.

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solicitudes que se presenten en cualquier pais en base a 6stas, incluido el derecho a presentar solicitudes en paises fuera del pafs de la solicitud prioritaria, en virtud de cualquier convenjo internacional; ademAs sobre todas y cada una de las mejoras, presentes o futuras, de divha o dichas invenciones, y efectuadas por nosotros en cardcter de enipleados, agentes o contratistas de dicha Monsanto Technology LLC; tambi6n todos los derechos sobre todas y cada una de dichas patentes, incluidas las revd1idas y pr6rrogas de 6stas, que se obtengan en cualquier pais respecto de dicha/s invenciones. o mejoras, y sobre todas y cada, una de las solicitudes adicionales, incluidas las SOliCitUdes divisionales,continuaciones, y continuaciones parciales, solicitudes de sustituci6n y soli-eltudes que reivindiquen el beneficio de uria solicitud provisional presentada anteriormente, que se presenten respecto de dicha invencion, invenciones o mejoras en cualquier pais; y
Pbr la presente autorizamos y solicitamos a la autoridad emisora a emItir todas y cada una de las patentes relativas a dicha solicitud o solicitudes a nombre de Monsanto Technology LLC, en su carActer de cesionaria de todos los derechos.
Acordamos ademds que, sin que medie pago alguno por parte de Monsanto Technology LLC apar-te del reembolso de los gastos razonables en los que incurramps, comunicaremos a dicha Monsanto Technology LLC, a sus representantes legales, agentes o cesionarios sobre cualquier hecho respecto de dicha invenci6n, invenciones o mejoras, incluso pruebas para casos de interferencia, oposici6n o cualquier otro procedimiento legal siempre que se nos lo solicite; prestaremos testimonio en casos de interferencia, oposici6n o en otros proccdimientos legales, siempre que se nos lo solicite y, firmaremos y entregaremos a pedido de la cesionaria, todos aquellos documentos licitos necesarios para hacer efectivas I las cldu.sulas preccdentes.
EN TESTIMONIO DE LO CUAL, firmamos al pie en las fechas indicadas junto a nuestras firmas.

(Firmado, ilegiblq) - Nombre- Natalia Bogdanova - Fecha: 15 de febrero de 2006 - Ciudad y Estado o Pais de residencia- St. Louis, Missouri
Estado de Missouri, Condado de St. Louis- A saber:
El dia 15 de febrero de 2006, ante mi, compareci6 personalmente Natalia Bogdanova persona de mi conocimiento, quien firm6 el instrumento adjunto y declar6 haberlo firmado

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Ciudad y Estado 0 Pais de residencia: Chesterfield, Missouri
Estado de Missouri, Condado de St. Louis- A saber
Fl dia 15 de marzo de 2006, ante mi, compareci6 personalmente James’K. Roberts, de mi conocimiento, quien firm6 el instrumento adjunto y declar6 haberlo firmado por su propia voluntad. En testimonio de lo cual, firmo y sello en el dia indicado anteriormente.
(Firma y sello): Darla D. Gault Notario ftblico Estado de Missouri Mi matricula vence el 01/10/2007 Matricula nro: 03385595 - Mi matricula vence el 01/10/2007 (Firmado, ilegible) Nombre: Charles P. Romano - Fecha: 15 de febrero de 2006
Ciudad y Estado o Pais de residencia: Chesterfield, Missouri
Estado de Missouri, Chidad de St. Louis- A saber
El dia 15 de febrero de 2006, ante mf, compareci6 personalmente Charles P. Romano, de mi conocimiento, quien firm6 el instrumento adjunto y declar6 haberlo firmado por su p"ropia voluntad. En testin-ionio de lo cual, firmo y sello en el dia indicado anteriormente. (Firma y sello): Christine Y. Hogan Notario Pfiblico Sello Notarial - Estado de Missouri Ciudad de St. Louis - Mi matricula vence el 17/11/2008 Matricula nro: 04513239
Mi matricula vence el 17/11/2008

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From the
INTERNATIONAL PWLIMINARY EXAMINING AUTHORITY

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To:

VON KREISLER, SELTING, WERNER PatentanwAlte
Postfach 10 22 41
0-50462 KdIn

ALLEMAGNE VyKFSTTMAK

0 6. DEL 200 7 -- I Date 4f mailing

03-12.2007

Applicant’s or agent’s f1le reference
062130wo JH/cw I PORTANT NOTIFICATION

International application No. International filing date (dayhnonth*ear) Priority date (dayAnonittkear)

PCTA)S2006)033808 30.08.2006 31.0&2005

Applicant
MONSANTO TECHNOLOGY LLC et al

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NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL PRELIMINARY
REPORT ON PATENTABILITY

(PCT Rule 71.1)

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the
international, preliminary report on patentability and its annexes, if any, established on the international application.

2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for
communication to all the elected Offices.

3. Where required, by any of the elected Offices, the International Bureau will prepare an English translation of
the report (but not of any annexes) and will transmit such translation to those Offices.

4. REMINDER

The applicant Must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices)
(Article 39(l)) (see also the reminder sent by the International Bureau with Form PCTAB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary report on patentability. It is the applicant’s responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume 11 of the PCT Applicant’s Guide.

The applicant’sattention is drawn to Article 33(5), which provides that the criteria of novelty, inventive step and industrial a plicability described in Article 33(2) to (4) merely serve the purposes of international preliminary exa ination and that "any Contracting State may apply additional or different criteria for the purposes of d"iding whether, in that State, the claimed inventions is patentable or not" (see also Article 27(5)). Such additional criteria may relate, for example, to exemptions from patentability, requirements for enabling disclo0ure, clarity and support for the claims.

Name and mailing address of the international
preliminary examining atIthority:

EuropeanFatent Office
0-80298 Munich
Tel. +49 89 2399 - 0 Tx: 523656 epmu d
Fax: +49 89 2399 - 4465

Form PCTAPEA/416 (January 2004)

Authorized Officer

Rauf, Anna jjj)
Tel. +49 89 2399-7548

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (Chapter 11 of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant’s or agents file reference I
FOR FURTHER ACTION 062130wo JHkw See Form PCTAPEA/4116

International application No.
PCTAJS2006/033868

International filing date (da#nonMIlearl Priority date (day4nonthlljear)
30.08.2006 31.08.2005

International Patent Classification (IPC) or national classification and [PC
INV. C07K14/325

Applicant
MONSANTO TECHNOLOGY LLC et al

I - This report is the international preliminary examination report, established by this International Preliminary Examining
Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 6 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
a. 0 sent to the applicant and to the international Bureau) a total of 6 sheets, as follows:
sheets of the description, claims andbr drawings which have been amended and are the basis of this report
ancUpr sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
C3 sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the International application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
b. C3 (sent to the international Bureau only) a total of (indicate type and number of electronic carrier(s)), containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box
Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

Box No. I Basis of the report
El Box No. 11 Priority
C3 Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
1:1 Box No. IV Lack of unity of invention
Z Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial
applicability: citations and explanations supporting such statement
El Box No. VI Certain documents cited
C3 Box No. VII Certain defects in the international application
Box No. Vill Certain observations on the international application

Dateolsubmission 0 Ithe demand Date of completion of this report

2007-07-02 03.12.2007

I Name and mailing address of the international
preliminary examining allthoft:

Authorized officer

European Patent Offico

D-80298 Munich PUONTI-KAERLAS, J Tel. +49 89 2399 - 0 Tx: 523656 epmu d
Fax: +49 80 2399 - 4465 Telephone No. +49 89 2399-7888

Form PCTAPEA/409 (Cover Sheet) (April 2005)

I

INTERNATIONAL PRELIMINARY REPORT International application No. ON PATENTABILITY PCTAJS2006/033868

Box No. I Mole of the report

1. With regard to the language, this report is based on

0 the international application in the language in which it was filed

0 a translation of the international application into, which is the language
of a translation furnished for the purposes of:
0 international search (under Rules 12.3(a) and 23.1 (b))
0 publication of the international application (under Rule 12.4(a))
13 international preliminary examination (under Rules 55.2(a) and/or 55.3(a))

2. With regard to the elements* of the international application, this report is based on (replacement sheets which have been furnis?ed to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originalfy filed’ and are not annexed to this report):

Description, Pages

1-23 as originally filed

Sequence listings part of the description, Pages

1-34 as originally filed

Claims, Numbors

1-36 received on 02.07.2007 with letter of 02.07.2007

0 a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing I
3.0 The amendments have resulted in the cancellation of:

0 the description, pages
El the claims, Nos.
0 the drawings, sheetsAigs
13 the sequence listing (specify):
El any table(§) related to sequence listing (specify):

4. El This report has been established as if (some of) the amendments annexed to this report and listed below
had not been made, since they have been considered to go beyond the disclosure as tiled, as indicated in the Supplemental Bok(Rule 70.2(c)).
0 the description, pages
0 the claims, Nos.
C) the drawinos, sheetsAigs
El the sequence listing (specify):
0 any table(s) related to sequence listing (specify):

if item 4 applies, some or all of these sheets may be marked "superseded."

Form PCTAPEA/409 (April 2005)

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INTERNATIONAL PRELIMINARY REPORT International application No. ON PATENTABILITY PCT/LJS2006A)33868

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or Industrial aeplicability; citations and explanations supporting such statement

1. Statement

Novelty (N) Yes: Claims 1-20,23-31,g4-3§
No: Claims 211,22,32,3?

inventive step (18) Yes: Claims 1-20,23-3134-$6
No: Claims 21,22,32.33

Industrial applicability (IA) Yes: Claims 1-36
No: Claims z

0 2. Citations and explanations (Rule 70.7):

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INTERNATIONA? PRELIMINARY REPORT International application No. ON PATENTABI ITY PCTAJS2006/033868

?upplernental Box relating to Sequence Listing
Continuation of Box 1, Item 2:
1. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the;Iaimed invention, this report was established on the basis of:
a. type of material:
0 a sequence listing
El table(s) related to the sequence listing
b. format of material:
on paper
in electronic form
c. time of filingiumishing:
0 contained,in the international application as filed
0 filed together with the International application in electronic form
11 furnished subsequently to this Authority for the purposes of search and/or examination
Cl received by this Authority as an amendment* on

2. 11 In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or
additional copies is identical to that in the application as filed or does not go beyond the application as filed,
as appropriate, were furnished.
3. Additional comments:

If item 4 in Box No. I applies, the listing andlbr table(s) related thereto, which form part of the basis of the report, may be marked "superseded. "

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INTERNATIONAL PRELIMINARY
REPORT ON PATENTABILITY
(SEPARATE SHEET)

International application No.

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1.1. Present application shows that a chimeric synthetic crylAb protein having the
amino acid sequence according to SEQ ID NO: 2 has a broad insecticidal activity range and can be expressed in transgenic plant without phytotoxic effects.

1.2. Reference is made to the following documents:
DII: WO 02/14517 A (MONSANTO TECHNOLOGY LLC; [US)) 21 February 2002 (2002-02-21)
D& WO 03/093484 A (BAYER SIOSCIENCE N V [BE]) 13 November 2003 (2003-11-13)

1.3. Document D1 discloses chimeric synthetic CrylAb proteins with broadened insect
host range. The protein disclosed in SEQ ID NO: 34 is 98.9% identical with that having the amino acid sequence according to SEQ ID NO: 2 of the current application over the whole length. Amino acids 460-650 comprise a region which
is 100% identical with amino acids 461-650 of SEQ ID NO: 2. The nucleotide sequence encoding said protein has 16 out of 19 and 19 out of 20 nucleotides identical with nucleotides 1401-1420 and nucleoticles 1821-1840 of SEQ ID NO: 1 of the current application. Di also discloses methods for detecting said polynucleotides/proteins in a sample,

Document D6 discloses a modified CrylAb protein having no phytotoxic effects.
The overall identity of said protein with that according to SEQ ID NO: 2 of the
current application is 90%, amino acids 10-466 of SEQ ID NO: 2 of the current application are 100% identical with the amino acids 11 -467 of the protein
disclosed, in D6.

2. Novelty and inventive step
2.1. Claims 21,22,33 and 32 are not new in view of document D1, thus failing to fulfil the requirements of Art. 33(2) PCT.

2.2. Although the prior art presently available to the IPEA discloses various chimeric
Cry proteins and segments of the claimed chimeric protein, it neither discloses nor suggests a chimeric protein having an amino acid sequence according to SEQ ID
NO: 2.

Consequently, present claims 1-20, 23-31 and 34-36 meet the requirement$ of
Art. 33(2)(3) PCT.

Form PCT/Separate Sheet/409 JSheet 1) (EPO-April 2005)

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INTERNATIONAL PRELIMINARY International application No. REPORT ON PATENTABILITY

(SEPARATE §HEED PCT/US2006/033868

Further comments:

1.1. From ft description it is clear that expression of the Cry protein in the transgenic
plants is an essential feature required for the technical effect of insect resistance.
This essential feature is not present in claims 34-36.

1.2. The use of the term "about" in claims 23-30 and 34 renders the scope of said
claims unclear (Art. 6 PCT).

Form PCT/Separate Sheet/409?,Sheet 2) (EPO-April 2005)

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Claims

What is claimed is-,

1, An isolated polynucleotide encoding an insecticidal protein comprising an amino acid sequence as set forth in SEQ ID NO.2 from amino acid position 10 through amino acid position 6M.

2. The isolated polynocleotide of Claim I selected from the group consisting of SEQ ID
NO. I and SEQ ID NO.3.

3. The isolated polynuclaotide of Claim 2 for use In expressing said insecticidal protein in a
crop piant.

4. The isolated polynuclaotide of Claim 3 wherein said crop plant is selected from the group
consistiq of a monocotyledonous crop plant and a dicotyledonous crop plant.

5. The isolated polynoclaotide of Claim 4 whtrein said monocatylodonous plant is selected
from the SMUP Of plants consisting of corn, wheat, oat, Yice, sorghum, Milo, buckwbeat, rye, graso (fescue, timothy, brorne, orchard, St. Augustinc, Bermuda, bentgrass), and barley.

6. The isolated polynuclootide of Claim 4 wherein said dicotyledonous planr is selected
from the group of plants consisting of alfalfa, apple, apricot, asparagus, bean, berry, blackberry, blueberry, canola, carrot, cauliflower, celery, oberry, chickpea, citrus 0m, cotton. cowpea, cranberry, cucumber, cucurbit, egg plant, fruit u-ee, grape, lemon, lettuce, linsocA melon, mustard, nut bearing tree, olcm orange, pea, peach, peanut, pear, plum, potato, soybeans, squash, stmwberry, sugar beet, sunflower, sweet potato, tobacco, tomato, turnip, and vegetable.

7. Az) isolated and purified insecticidal protein comprising an amino acid sequence as set
forth in S9Q IX) NO., 2 from amino acid position 10 through amino acid position 600.

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8. A composition comprising an insecticidally effective amount of the isolated and purified protein of Claim 7.

9. An expression cassette for use in expressing an insecticidal protein having an arnino acid sequeneg as set fortb in SEQ ID NO-2 in a host cell, wherein said expression cassette comptim in operable linkage a promoter sequence functional in said host cell and a polynucleotide encoding said protein.

10- Tht expression Cassette Of Claim 9 Wherein said host cell is selected from the group consisting of a bacterial cell, a fungal cell, a rnwrimalian cell, and a plant cell.

11. The exMssion cassette of Claim 10 wherein

(a) said bacterial cell is selected from the group consisting of a BacfUus spedes cell, a Enterobacteriacae species cell, a Pseudomonas species cell, a Clostridium species
cell. and a Rhizobium species cell, and a Agrobacterium species cell; and
(b) said plant cell is selected from the group of plants consisting of a dicotyledonous plant and a monocotyledonous plan? said dicotyledonous plant being furrher selected from the group consisting of alfalfa, apple, apricot, asparagu-s, bean, berry, blackberry, blueberry, canola, carrot, cauliflower, celery, cherry, chickpea, citrus tree, cotton, covqxa, cmberry, cucurnber, cucurbit, egg plant. fruit tree? grape, lemon, lettuce, linseed, melon, mustard, out beating tree, okra, orange, pea, peach, peanut, pear,
plum, potato, soybeans, squash, strawberry, sugar beet, sunflower, sweet potato, tob=o, tomato, turnip, and vegetable, and said monocotyledonous plant being furdwr selected ftorn the group consisting of corn, wheat, oat, rice, sorghum, mjlo’ buckwhem, rye, grass (fescue, timothy, brome, orchard, St Augustine, Bermuda, bcatgrass), aW barley.

12. The expression cassette of Claim 9 wherein said host cell is a plant cell and said expression cassette further comprises in operable linkage a polyaucleotide selected from the group consisting of an expression enhancer sequence, an untranslated leader sequence,, an intron sequence, a chloroplast targeting popEide encoding sequence, and a trawc6ption termination and polyadenylation sequence.

13. A vector comprising the expression cassede of any of Claims 9 through Claim 12.

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14, A tramgvnic plant or plant cell resistant to lepidopteran insect infestation comprising a polynuclootide encoding a protein exhibiting an amino add sequence as set forth in SEQ ID NO.2 f3rom amino acid position 10 through amino acid position 600, wherein said protein exhibits insecticidal activity when expressed in said plant or plant cell.

15. The a-augenic plant or plant cell of claim 14 wherein said transgenic plant is Selected from the group consisting of a dicotyledonous plant and a monocotyledonous plant, said dicorylodonous plant being fta-ther selected from the group consisting of alfWa, apple, apricot? 4sparagus, bean, berry, blackberry, blueberry, canola, carrot, cauliflower, celery, cherry, chickpea, citrus tiee, cotton, cowpea, cranberry, cucumber, cacurbit, egg plant, fruit tree, grape, lemon, lettuce, linseed. melon, mustard, nut bearing tree, okra, orange, pea, peach, peanut, pm, pluin, potato, soybeans, squash, strawberry, sugar beet, sunflowej? sweet potato, tobacco, tomato, turnip, and vegetable, and said monocotyledonous plant being further selected from the group consisting of corn, wheat? oat, rice, sorghum, milo, buckwheat, rye, grass (fescue. timothy, brome, orchard, St. Augustine, Bermuda, bentgrass), and barley.

16. T’he transgenic plant or plant cell of claim 15 resistant to lepidoptem insect infestation, wherein said lepidopteran insect is selected from the group consisting of a leaf roller, a cutworm an armyworm, a borer, a bagwom and a forage fWer.

17. The transZenic plant or plant cell of claim 16, wherein said lepidoptmn insect is further selected trom the group consisting of a fall annyworm, a European corn borer, a corn earworm or cotton bollwom, a southwestern corn borer, and a black cutworm.

18. Progeny or seed of the transgenic plant or plant cell of cl4im 15, wherein said progeny or seed comprise said polynucleotide.

19. A method for controlling lepidopteran insect infestation of a plant by providing in the diet of the insect one or more plant cells transformed with a nucleic acid comprising in operable Unkage a plant fimctional promoter and a polynucleodde encoding a protein that ex1iibits an amino acid sequence as set forth in SEQ ID NO:2 from arnino acid position 10 through amino acid position 600 exhibiting lepidoptcran insecticidal activity.

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Substitute Sheet

20, The expression cassette of claim 12 comprising a polynucleotide selected from the group consisting of SEQ ID NO:5 and SEQ ID 140:7.

21. A method of ideatif?ing in a biological sample a polynucleotide encoding a CrylA.105
protein exhibiting an amino acid sequence as set forth in SEQ ID NO:2 from about amino add position 10 through about amino acid position 600, said method comprising contacting said sample with a polyaucleotide probe that hybridizes to the polyaucleotide under stringent hybridization conditions and detecting the binding of said polynuelcotide probe to said polyntioleotide, wherein said binding is diagnostic for the presence of said polynuclaotide in said sample.

22. A method of identifying in a swnple a Cry1A. 105 protein exhibiting an antino acid sequence as set forth in SEQ ID NO-.2 from about amino acid position 10 thtough about amino acid position 600, said method comprising contacting said sample with an antibody that binds specifically to said protein, and detecting the binding, wherein said binding is diaposd?- for the presenx?c of said protein in said sample.

23? An isolated polynucleotide encoding an insecticidal protein exhibiting an amino acid sequence;as set forth at SEQ ID NO:2 from about amino acid I.through about amino acid
612.

24. An isolated polynucleodde encoding an insecticidal protein as set forth at SEQ fl) NO:2 from aboot ainino acid I through about amino acid 610.

25. The isolaW polynuclootidc of Claim 23 exhibiting at lC’Ut about 90% identity to the nucleo" sequence, as set forth at SEQ ID NO: i -

26, The isolated polyntioleotide of Claim 23 exhibiting at kast about 90% identity to the nucleodde sequence as Set forth at SEQ W NO:3.

27, A hybrid Insecticidal Protein com?risino an amino acid segment comprising from about 500 to about 600 contiguous amino acids selected from the araino acid segment as set forth at SEQ U) NO-.2 from about amino acid position 10 through about amino acid positioll 60.

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