

SCORE Placeholder Sheet for IFW Content

Application Number: 12907488

Document Date: 10/19/2010

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Form Revision Date: February 8, 2006

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Form Revision Date: February 8, 2006

UTILITY PATENT APPLICATION TRANSMITTAL (Only for new nonprovisional applications under 37 CFR 1.53(b))	Attorney Docket No.: 035718/387563
	First Inventor: James Wayne Bing
	Title: CORN EVENT DAS-59122-7 AND METHODS FOR DETECTION THEREOF

ADDRESS TO: **COMMISSIONER FOR PATENTS**
P.O. BOX 1450
ALEXANDRIA, VA 22313-1450

Transmitted herewith for filing in the United States Patent Office is a utility patent application.

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Assignees of this invention are Pioneer Hi-Bred International, Inc., E.I. DuPont deNemours and Company, Dow AgroSciences LLC

1. ☒ The Filing Fee has been calculated as shown below:
2. ☐ Applicant claims Small Entity Status. See 37 CFR 1.27.

		Small Entity		Large Entity		
No. Filed		No. Extra	Rate	Fee 0	Rate	Fee 1
BASIC FEE				\$ 0		\$ 330
SEARCH FEE				\$ 0		\$ 540
EXAMINATION FEE				\$ 0		\$ 220
TOTAL CLAIMS:		9 - 20 = 0		X 26 = 0		x 52 = \$ 0
INDEP CLAIMS:		4 - 3 = 1		X 110 = \$ 0		x 220 = \$ 220
APPLICATION SIZE FEE	If the specification, drawings, and sequence listing exceed 100 sheets of paper, the application size fee due is \$270 (\$135 for small entity) for each additional 50 sheets or fraction thereof.					
☐ MULTIPLE DEPENDENT CLAIMS PRESENTED				+195 = \$		+390 = \$
*If the difference in Column 1 is less than zero, enter "0" in Column 2.			TOTAL	\$	TOTAL	\$ 1310.00

The Commissioner is hereby authorized to credit overpayments or charge the following fees to Deposit Acct. No. 16-0605.

- a. ☒ Fees required under 37 CFR 1.16 (National filing fees).
b. ☒ Fees required under 37 CFR 1.17 (National application processing fees) including any extension of time fees under 37 CFR § 1.136(a) that are required for consideration of papers filed during prosecution.
- ☐ A check in the amount of \$ ___ for the filing fee is enclosed.
☒ The filing fees are being authorized when e-filing.
- ☐ The above filing fee will be paid along with Applicant(s) Response to the Notice to File Missing Parts.
3. ☒ Specification; Total Pages 44
4. ☒ 7 Sheets of Drawing(s) (35 USC 113)
5. ☒ Declaration and Power of Attorney; [Total Pages 13]
a. ☐ Newly executed (original or copy)
b. ☒ Copy from a prior application (37 CFR 1.63(d))
(for continuation/divisional with Box 18 completed)

- i. ☐ DELETION OF INVENTOR(S) Signed statement attached deleting inventor(s) named in the prior application, see 37 CFR 1.63(d)(2) & 1.33(b).
6. ☒ Application Data Sheet. See 37 CFR 1.76
7. ☐ CD-ROM or CD-R in duplicate, large table or Computer Program (Appendix)
☐ Landscape Table on CD
8. Nucleotide and/or Amino Acid Sequence Submission (if applicable, all necessary)
- a. ☐ Computer Readable Form (CRF)
- b. ☐ Request for Transfer of Computer Readable Form of Sequence Listing under 37 CFR § 1.821(e) and MPEP 2422.05 (must be compliant with new rules)
- c. ☒ Specification Sequence Listing on:
- i. ☐ CD-ROM or CD-R (2 copies); or
- ii. ☐ Paper
- iii. ☒ Electronic Text File Submission
- d. ☐ Statements verifying identity of above copies

ACCOMPANYING APPLICATION PARTS

9. ☐ Assignment Papers (cover sheet & document(s) (including \$40.00 fee)
Name of Assignee
10. ☐ 37 CFR 3.73(b) Statement and General Power of Attorney by Assignee. OR
☒ Revocation Of Power of Attorney And New Power Of Attorney By Assignee And Change Of Correspondence Address, filed in parent application no. 11/938,483, filed November 12, 2007
11. ☐ English Translation Document (*if applicable*)
12. ☒ Information Disclosure Statement (IDS)/PTO-1449; 0 Copies of IDS Citations
13. ☐ Preliminary Amendment
14. ☐ Return Receipt Postcard (MPEP 503) (*Should be specifically itemized*)
15. ☐ Certified Copy of Priority Document(s) (*if foreign priority is claimed*)
☐ Foreign Priority is claimed as Application No. , filed
16. ☐ Nonpublication Request under 35 U.S.C. 122(b)(2)(B)(i).
Applicant **must** attach form PTO/SB35 or its equivalent.
17. ☐ Request for Early Publication Under 37 CFR § 1.219. Fee of \$300.00 is enclosed.
18. **If a CONTINUING APPLICATION, check appropriate box and supply the requisite information below and in a preliminary amendment, or in an Application Data Sheet under 37 CFR 1.76:**
☐ Continuation ☒ Divisional ☐ Continuation in Part (CIP)
of prior Application No: 11/938,483; Filed November 12, 2007

Prior Application Information: Examiner Anne R. Kubelik Group/Art Unit: 1638

For CONTINUATION or DIVISIONAL APPS only: The entire disclosure of the prior application, from which an oath or declaration is supplied under Box 5b, is considered a part of the disclosure of the accompanying continuation or divisional application and is hereby incorporated by reference. The incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application parts.

19. **CORRESPONDENCE ADDRESS** **CUSTOMER NUMBER 29122**

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(Utility Patent Application Transmittal) Page 2

CORN EVENT DAS-59122-7 AND METHODS FOR
DETECTION THEREOF

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CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a divisional of U.S. Serial No. 11/938,483, filed November 12, 2007, which is a divisional of U.S. Serial. No. 11/237,222 filed September 28, 2005, which claims the benefit of U.S. Provisional Application Serial No. 60/614,225, filed September 29, 2004, the contents of all of which are herein incorporated by reference in their entirety.

FIELD OF INVENTION

Embodiments of the present invention relate to the field of plant molecular biology, specifically an embodiment of the invention relates to a DNA construct for conferring insect resistance to a plant. Embodiments of the invention more specifically relate to an insect resistant corn plant DAS-59122-7 and to assays for detecting the presence of corn plant DAS-59122-7 DNA in a sample and compositions thereof.

BACKGROUND OF INVENTION

An embodiment of this invention relates to the insect resistant corn (*Zea mays*) plant DAS-59122-7, also referred to as maize line DAS-59122-7 or maize event DAS-59122-7, and

to the DNA plant expression construct of corn plant DAS-59122-7 and the detection of the transgene/flanking insertion region in corn plant DAS-59122-7 and progeny thereof.

Corn is an important crop and is a primary food source in many areas of the world. Damage caused by insect pests is a major factor in the loss of the world's corn crops, despite the use of protective measures such as chemical pesticides. In view of this, insect resistance has been genetically engineered into crops such as corn in order to control insect damage and to reduce the need for traditional chemical pesticides. One group of genes which have been utilized for the production of transgenic insect resistant crops are the delta-endotoxins from *Bacillus thuringiensis* (*B.t.*). Delta-endotoxins have been successfully expressed in crop plants such as cotton, potatoes, rice, sunflower, as well as corn, and have proven to provide excellent control over insect pests. (Perlak, F.J *et al.* (1990) *Bio/Technology* 8, 939-943; Perlak, F.J. *et al.* (1993) *Plant Mol. Biol.* 22: 313-321; Fujimoto H. *et al.* (1993) *Bio/Technology* 11: 1151-1155; Tu *et al.* (2000) *Nature Biotechnology* 18:1101-1104; PCT publication number WO 01/13731; and Bing JW *et al.* (2000) Efficacy of Cry1F Transgenic Maize, 14th Biennial International Plant Resistance to Insects Workshop, Fort Collins, CO).

The expression of foreign genes in plants is known to be influenced by their location in the plant genome, perhaps due to chromatin structure (e.g., heterochromatin) or the proximity of transcriptional regulatory elements (e.g., enhancers) close to the integration site (Weising *et al.*, *Ann. Rev. Genet* 22:421-477, 1988). At the same time the presence of the transgene at different locations in the genome will influence the overall phenotype of the plant in different ways. For this reason, it is often necessary to screen a large number of events in order to identify an event characterized by optimal expression of an introduced gene of interest. For example, it has been observed in plants and in other organisms that there may be a wide variation in levels of expression of an introduced gene among events. There may also be differences in spatial or temporal patterns of expression, for example, differences in the relative expression of a transgene in various plant tissues, that may not correspond to the patterns expected from transcriptional regulatory elements present in the introduced gene construct. For this reason, it is common to produce hundreds to thousands of different events and screen those events for a single event that has desired transgene expression levels and patterns for commercial purposes. An event that has desired levels or patterns of transgene expression is useful for introgressing the transgene into other genetic backgrounds by sexual outcrossing using conventional breeding methods. Progeny of such crosses maintain the transgene

expression characteristics of the original transformant. This strategy is used to ensure reliable gene expression in a number of varieties that are well adapted to local growing conditions.

It would be advantageous to be able to detect the presence of a particular event in order to determine whether progeny of a sexual cross contain a transgene of interest. In addition, a method for detecting a particular event would be helpful for complying with regulations requiring the pre-market approval and labeling of foods derived from recombinant crop plants, for example, or for use in environmental monitoring, monitoring traits in crops in the field, or monitoring products derived from a crop harvest, as well as for use in ensuring compliance of parties subject to regulatory or contractual terms.

It is possible to detect the presence of a transgene by any nucleic acid detection method known in the art including, but not limited to, the polymerase chain reaction (PCR) or DNA hybridization using nucleic acid probes. These detection methods generally focus on frequently used genetic elements, such as promoters, terminators, marker genes, etc., because for many DNA constructs, the coding region is interchangeable. As a result, such methods may not be useful for discriminating between different events, particularly those produced using the same DNA construct or very similar constructs unless the DNA sequence of the flanking DNA adjacent to the inserted heterologous DNA is known. For example, an event-specific PCR assay is described in U.S. Patent No. 6,395,485 for the detection of elite event GAT-ZM1. Accordingly, it would be desirable to have a simple and discriminative method for the identification of event DAS-59122-7.

SUMMARY OF INVENTION

Embodiments of this invention relate to methods for producing and selecting an insect resistant monocot crop plant. More specifically, a DNA construct is provided that when expressed in plant cells and plants confers resistance to insects. According to one aspect of the invention, a DNA construct, capable of introduction into and replication in a host cell, is provided that when expressed in plant cells and plants confers insect resistance to the plant cells and plants. The DNA construct is comprised of a DNA molecule named PHI17662A and it includes three (3) transgene expression cassettes. The first expression cassette comprises a DNA molecule which includes the promoter, 5' untranslated exon, and first intron of the maize ubiquitin (Ubi-1) gene (Christensen *et al.* (1992) *Plant Mol. Biol.* 18:675-689 and Christensen

and Quail (1996) *Transgenic Res.* 5:213-218) operably connected to a DNA molecule encoding a *B.t.* δ -endotoxin identified as Cry34Ab1 (U.S. Pat. Nos. 6,127,180, 6,624,145 and 6,340,593) operably connected to a DNA molecule comprising a Pin II transcriptional terminator isolated from potato (Gyheung An *et al.* (1989) *Plant Cell.* 1:115-122). The second transgene expression cassette of the DNA construct comprises a DNA molecule encoding the wheat peroxidase promoter (Hertig *et al.* (1991) *Plant Mol. Biol.* 16:171-174) operably connected to a DNA molecule encoding a *B.t.* δ -endotoxin identified as Cry35Ab1 (U.S. Pat. Nos. 6,083,499, 6,548,291 and 6,340,593) operably connected to a DNA molecule comprising a Pin II transcriptional terminator isolated from potato (Gyheung An *et al.* (1989) *Plant Cell.* 1:115-122). The third transgene expression cassette of the DNA construct comprises a DNA molecule of the cauliflower mosaic virus (CaMV) 35S promoter (Odell J.T. *et al.* (1985) *Nature* 313: 810-812; Mitsuhashi *et al.* (1996) *Plant Cell Physiol.* 37: 49-59) operably connected to a DNA molecule encoding a phosphinothricin acetyltransferase (PAT) gene (Wohleben W. *et al.* (1988) *Gene* 70: 25-37) operably connected to a DNA molecule comprising a 3' transcriptional terminator from (CaMV) 35S (see Mitsuhashi *et al.* (1996) *Plant Cell Physiol.* 37: 49-59). Plants containing the DNA construct are also provided.

According to another embodiment of the invention, compositions and methods are provided for identifying a novel corn plant designated DAS-59122-7, which methods are based on primers or probes which specifically recognize the 5' and/or 3' flanking sequence of DAS-59122-7. DNA molecules are provided that comprise primer sequences that when utilized in a PCR reaction will produce amplicons unique to the transgenic event DAS-59122-7. These molecules may be selected from the group consisting of:

- 5'-GTGGCTCCTTCAACGTTGCGGTTCTGTC-3' (SEQ ID NO: 1);
- 5'-CGTGCAAGCGCTCAATTCGCCCTATAGTG-3' (SEQ ID NO: 2);
- 5'-AATTGAGCGCTTGCACGTTT-3' (SEQ ID NO: 3);
- 5'-AACAACAAGACCGGCCACACCCTC-3' (SEQ ID NO: 4);
- 5'-GAGGTGGTCTGGATGGTGTAGGTCA-3' (SEQ ID NO: 5);
- 5'-TACAACCTCAAGTGGTTCCTCTTCCCGA-3' (SEQ ID NO: 6);
- 5'-GAGGTCTGGATCTGCATGATGCGGA-3' (SEQ ID NO: 7);
- 5'-AACCCTTAGTATGTATTTGTATT-3' (SEQ ID NO: 8);
- 5'-CTCCTTCAACGTTGCGGTTCTGTCAG-3' (SEQ ID NO: 9);
- 5'-TTTGTCAAAGCGAACGATTCAGATG-3' (SEQ ID NO: 10);

5'-GCGGGACAAGCCGTTTACGTTT-3' (SEQ ID NO: 11);
 5'-GACGGGTGATTTATTTGATCTGCAC-3' (SEQ ID NO: 12);
 5'-CATCTGAATCGTTCGCTTTGCAAAA-3' (SEQ ID NO: 13);
 5'-CTACGTTCCAATGGAGCTCGACTGTC-3' (SEQ ID NO: 14);
 5'-GGTCAAGTGGACACTTGGTCACTCA-3' (SEQ ID NO: 15);
 5'-GAGTGAAGAGATAAGCAAGTCAAAG-3' (SEQ ID NO: 16);
 5'-CATGTATACGTAAGTTTGGTGCTGG-3' (SEQ ID NO: 17);
 5'-AATCCACAAGATTGGAGCAAACGAC-3' (SEQ ID NO: 18);
 5'-CGTATTACAATCGTACGCAATTCAG-3' (SEQ ID NO: 36);
 5'-GGATAAACAAACGGGACCATAGAAG-3' (SEQ ID NO: 37) and complements thereof.
 The corn plant and seed comprising these molecules is an embodiment of this invention.
 Further, kits utilizing these primer sequences for the identification of the DAS-59122-7 event
 are provided.

An additional embodiment of the invention relates to the specific flanking sequences of
 DAS-59122-7 described herein, which can be used to develop specific identification methods
 for DAS-59122-7 in biological samples. More particularly, the invention relates to the 5'
 and/or 3' flanking regions of DAS-59122-7, SEQ ID NO: 19, 5' flanking and SEQ ID NO: 20,
 3' flanking, respectively, which can be used for the development of specific primers and
 probes. A further embodiment of the invention relates to identification methods for the
 presence of DAS-59122-7 in biological samples based on the use of such specific primers or
 probes.

According to another embodiment of the invention, methods of detecting the presence
 of DNA corresponding to the corn event DAS-59122-7 in a sample are provided. Such
 methods comprise: (a) contacting the sample comprising DNA with a DNA primer set, that
 when used in a nucleic acid amplification reaction with genomic DNA extracted from corn
 event DAS-59122-7 produces an amplicon that is diagnostic for corn event DAS-59122-7; (b)
 performing a nucleic acid amplification reaction, thereby producing the amplicon; and (c)
 detecting the amplicon.

DNA molecules that comprise the novel transgene/flanking insertion region, SEQ ID
 NO: 21, 5' flanking plus 1000 internal and SEQ ID NO: 22, 3' flanking plus 1000 internal and
 are homologous or complementary to SEQ ID NO: 21 and SEQ ID NO: 22 are an embodiment
 of this invention.

DNA sequences that comprise the novel transgene/flanking insertion region, SEQ ID NO: 21 are an embodiment of this invention. DNA sequences that comprise a sufficient length of polynucleotides of transgene insert sequence and a sufficient length of polynucleotides of maize genomic and/or flanking sequence from maize plant DAS-59122-7 of SEQ ID NO: 21 that are useful as primer sequences for the production of an amplicon product diagnostic for maize plant DAS-59122-7 are included.

In addition, DNA sequences that comprise the novel transgene/flanking insertion region, SEQ ID NO: 22 are provided. DNA sequences that comprise a sufficient length of polynucleotides of transgene insert sequence and a sufficient length of polynucleotides of maize genomic and/or flanking sequence from maize plant DAS-59122-7 of SEQ ID NO: 22 that are useful as primer sequences for the production of an amplicon product diagnostic for maize plant DAS-59122-7 are included.

According to another embodiment of the invention, the DNA sequences that comprise at least 11 or more nucleotides of the transgene portion of the DNA sequence of SEQ ID NO: 21 or complements thereof, and a similar length of 5' flanking maize DNA sequence of SEQ ID NO: 21 or complements thereof are useful as DNA primers in DNA amplification methods. The amplicons produced using these primers are diagnostic for maize event DAS-59122-7. Therefore, embodiments of the invention also include the amplicons produced by DNA primers homologous or complementary to SEQ ID NO: 21.

According to another embodiment of the invention, the DNA sequences that comprise at least 11 or more nucleotides of the transgene portion of the DNA sequence of SEQ ID NO: 22 or complements thereof, and a similar length of 3' flanking maize DNA sequence of SEQ ID NO: 22 or complements thereof are useful as DNA primers in DNA amplification methods. The amplicons produced using these primers are diagnostic for maize event DAS-59122-7. Therefore, embodiments of the invention also include the amplicons produced by DNA primers homologous or complementary to SEQ ID NO: 22.

More specifically, a pair of DNA molecules comprising a DNA primer set, wherein the DNA molecules are identified as SEQ ID NO: 18 or complements thereof and SEQ ID NO: 1 or complements thereof; SEQ ID NO: 2 or complements thereof and SEQ ID NO: 17 or complements thereof; SEQ ID NO: 10 or complements thereof and SEQ ID NO: 9 or complements thereof; SEQ ID NO: 8 or complements thereof and SEQ ID NO: 17 or

complements thereof; and SEQ ID NO: 36 or complements thereof and SEQ ID NO: 37 or complements thereof are embodiments of the invention.

Further embodiments of the invention include the amplicon comprising the DNA molecules of SEQ ID NO: 18 and SEQ ID NO: 1; the amplicon comprising the DNA molecules of SEQ ID NO: 2 and SEQ ID NO: 17; the amplicon comprising the DNA molecules of SEQ ID NO: 10 and SEQ ID NO: 9; the amplicon comprising the DNA molecules of SEQ ID NO: 8 and SEQ ID NO: 17; and the amplicon comprising the DNA molecules of SEQ ID NO: 36 and SEQ ID NO: 37.

Further embodiments of the invention include the following primers, which are useful in detecting or characterizing event DAS-59122-7: SEQ ID NO: 11 or complements thereof; SEQ ID NO: 5 or complements thereof; SEQ ID NO: 4 or complements thereof; SEQ ID NO: 7 or complements thereof; SEQ ID NO: 6 or complements thereof; SEQ ID NO: 3 or complements thereof; SEQ ID NO: 18 or complements thereof; SEQ ID NO: 14 or complements thereof; SEQ ID NO: 13 or complements thereof; SEQ ID NO: 15 or complements thereof; SEQ ID NO: 17 or complements thereof; SEQ ID NO: 16 or complements thereof; and SEQ ID NO: 12 or complements thereof. Further embodiments also include the amplicons produced by pairing any of the primers listed above.

According to another embodiment of the invention, methods of detecting the presence of a DNA molecule corresponding to the DAS-59122-7 event in a sample, such methods comprising: (a) contacting the sample comprising DNA extracted from a corn plant with a DNA probe, molecule that hybridizes under stringent hybridization conditions with DNA extracted from corn event DAS-59122-7 and does not hybridize under the stringent hybridization conditions with a control corn plant DNA; (b) subjecting the sample and probe to stringent hybridization conditions; and (c) detecting hybridization of the probe to the DNA. More specifically, a method for detecting the presence of a DNA molecule corresponding to the DAS-59122-7 event in a sample, such methods, consisting of (a) contacting the sample comprising DNA extracted from a corn plant with a DNA probe molecule that consists of sequences that are unique to the event, e.g. junction sequences, wherein said DNA probe molecule hybridizes under stringent hybridization conditions with DNA extracted from corn event DAS-59122-7 and does not hybridize under the stringent hybridization conditions with a control corn plant DNA; (b) subjecting the sample and probe to stringent hybridization conditions; and (c) detecting hybridization of the probe to the DNA.

In addition, a kit and methods for identifying event DAS-59122-7 in a biological sample which detects a DAS-59122-7 specific region within SEQ ID NO: 23 are provided.

DNA molecules are provided that comprise at least one junction sequence of DAS-59122-7 selected from the group consisting of SEQ ID NO: 32, 33, 34, and 35 and complements thereof; wherein a junction sequence spans the junction between heterologous DNA inserted into the genome and the DNA from the corn cell flanking the insertion site, i.e. flanking DNA, and is diagnostic for the DAS-59122-7 event.

According to another embodiment of the invention, methods of producing an insect resistant corn plant that comprise the steps of: (a) sexually crossing a first parental corn line comprising the expression cassettes of the invention, which confers resistance to insects, and a second parental corn line that lacks insect resistance, thereby producing a plurality of progeny plants; and (b) selecting a progeny plant that is insect resistant. Such methods may optionally comprise the further step of back-crossing the progeny plant to the second parental corn line to producing a true-breeding corn plant that is insect resistant.

A further embodiment of the invention provides a method of producing a corn plant that is resistant to insects comprising transforming a corn cell with the DNA construct PH117662A (SEQ ID NO: 24), growing the transformed corn cell into a corn plant, selecting the corn plant that shows resistance to insects, and further growing the corn plant into a fertile corn plant. The fertile corn plant can be self pollinated or crossed with compatible corn varieties to produce insect resistant progeny.

Another embodiment of the invention further relates to a DNA detection kit for identifying maize event DAS-59122-7 in biological samples. The kit comprises a first primer which specifically recognizes the 5' or 3' flanking region of DAS-59122-7, and a second primer which specifically recognizes a sequence within the foreign DNA of DAS-59122-7, or within the flanking DNA, for use in a PCR identification protocol. A further embodiment of the invention relates to a kit for identifying event DAS-59122-7 in biological samples, which kit comprises a specific probe having a sequence which corresponds or is complementary to, a sequence having between 80% and 100% sequence identity with a specific region of event DAS-59122-7. The sequence of the probe corresponds to a specific region comprising part of the 5' or 3' flanking region of event DAS-59122-7.

The methods and kits encompassed by the embodiments of the present invention can be used for different purposes such as, but not limited to the following: to identify event DAS-

59122-7 in plants, plant material or in products such as, but not limited to, food or feed products (fresh or processed) comprising, or derived from plant material; additionally or alternatively, the methods and kits can be used to identify transgenic plant material for purposes of segregation between transgenic and non-transgenic material; additionally or
5 alternatively, the methods and kits can be used to determine the quality of plant material comprising maize event DAS-59122-7. The kits may also contain the reagents and materials necessary for the performance of the detection method.

A further embodiment of this invention relates to the DAS-59122-7 corn plant or its parts, including, but not limited to, pollen, ovules, vegetative cells, the nuclei of pollen cells,
10 and the nuclei of egg cells of the corn plant DAS-59122-7 and the progeny derived thereof. The corn plant and seed DAS-59122-7 from which the DNA primer molecules provide a specific amplicon product is an embodiment of the invention.

The foregoing and other aspects of the invention will become more apparent from the following detailed description and accompanying drawing.

15 BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1. DNA sequence (SEQ ID NO: 23) showing the transgenic insert PHI17662A, as well as the sequences flanking the transgenic insert. The 5' and 3' border regions, bp 1 to bp2593 and bp 9937 to bp 11922, respectively, are underlined. Two nucleotide differences (bp 6526 and bp 6562) based on comparison to the transforming plasmid PHP17662 are noted in
20 bold and underlined.

FIG. 2. Schematic diagram of the *B.t.* Cry34/35Ab1 event DAS-59122-7 insert region is divided into three separate sections; the 5' border region with corn genomic DNA, the intact T-DNA insert, and the 3' border region with corn genomic DNA. The two arrows beneath the diagram of the insert indicate the start and end points of the sequence derived from 5' and 3'
25 genome walking fragments. Other boxes beneath the diagram of the insert represent PCR fragments that were amplified from genomic DNA of event DAS-59122-7 and sequenced to cover the intact T-DNA insert and the 5' and 3' insert/border junction regions.

FIG. 3. Schematic diagram of the *B.t.* Cry34/35Ab1 event DAS-59122-7 insert region is divided into three separate sections; the 5' border region with corn genomic DNA, the intact T-DNA insert, and the 3' border region with corn genomic DNA. Boxes beneath the diagram
30 of the insert represent PCR fragments located in either the genomic border regions or across the

5' and 3' junction regions of the T-DNA insert with corn genomic DNA that were amplified from genomic DNA from event DAS-59122-7.

DETAILED DESCRIPTION

5 The following definitions and methods are provided to better define the present invention and to guide those of ordinary skill in the art in the practice of the present invention. Unless otherwise noted, terms are to be understood according to conventional usage by those of ordinary skill in the relevant art. Definitions of common terms in molecular biology may also be found in Rieger *et al.*, *Glossary of Genetics: Classical and Molecular*, 5th edition, 10 Springer-Verlag; New York, 1991; and Lewin, *Genes V*, Oxford University Press: New York, 1994. The nomenclature for DNA bases as set forth at 37 CFR §1.822 is used.

As used herein, the term "comprising" means "including but not limited to".

As used herein, the term "corn" means *Zea mays* or maize and includes all plant varieties that can be bred with corn, including wild maize species.

15 As used herein, the term "DAS-59122-7 specific" refers to a nucleotide sequence which is suitable for discriminatively identifying event DAS-59122-7 in plants, plant material, or in products such as, but not limited to, food or feed products (fresh or processed) comprising, or derived from plant material.

As used herein, the terms "insect resistant" and "impacting insect pests" refers to 20 effecting changes in insect feeding, growth, and/or behavior at any stage of development, including but not limited to: killing the insect; retarding growth; preventing reproductive capability; inhibiting feeding; and the like.

As used herein, the terms "pesticidal activity" and "insecticidal activity" are used synonymously to refer to activity of an organism or a substance (such as, for example, a 25 protein) that can be measured by numerous parameters including, but not limited to, pest mortality, pest weight loss, pest attraction, pest repellency, and other behavioral and physical changes of a pest after feeding on and/or exposure to the organism or substance for an appropriate length of time. For example "pesticidal proteins" are proteins that display pesticidal activity by themselves or in combination with other proteins.

30 "Coding sequence" refers to a nucleotide sequence that codes for a specific amino acid sequence. As used herein, the terms "encoding" or "encoded" when used in the context of a specified nucleic acid mean that the nucleic acid comprises the requisite information to guide

translation of the nucleotide sequence into a specified protein. The information by which a protein is encoded is specified by the use of codons. A nucleic acid encoding a protein may comprise non-translated sequences (e.g., introns) within translated regions of the nucleic acid or may lack such intervening non-translated sequences (e.g., as in cDNA).

5 “Gene” refers to a nucleic acid fragment that expresses a specific protein, including regulatory sequences preceding (5’ non-coding sequences) and following (3’ non-coding sequences) the coding sequence. “Native gene” refers to a gene as found in nature with its own regulatory sequences. “Chimeric gene” refers any gene that is not a native gene, comprising regulatory and coding sequences that are not found together in nature. Accordingly, a chimeric
10 gene may comprise regulatory sequences and coding sequences that are derived from different sources, or regulatory sequences and coding sequences derived from the same source, but arranged in a manner different than that found in nature. “Endogenous gene” refers to a native gene in its natural location in the genome of an organism. “Foreign” refers to material not normally found in the location of interest. Thus “foreign DNA” may comprise both
15 recombinant DNA as well as newly introduced, rearranged DNA of the plant. A “foreign” gene refers to a gene not normally found in the host organism, but that is introduced into the host organism by gene transfer. Foreign genes can comprise native genes inserted into a non-native organism, or chimeric genes. A “transgene” is a gene that has been introduced into the genome by a transformation procedure. The site in the plant genome where a recombinant
20 DNA has been inserted may be referred to as the “insertion site” or “target site”.

As used herein, “insert DNA” refers to the heterologous DNA within the expression cassettes used to transform the plant material while “flanking DNA” can exist of either genomic DNA naturally present in an organism such as a plant, or foreign (heterologous) DNA introduced via the transformation process which is extraneous to the original insert DNA
25 molecule, e.g. fragments associated with the transformation event. A “flanking region” or “flanking sequence” as used herein refers to a sequence of at least twenty (20) base pair, preferably at least fifty (50) base pair, and up to five thousand (5000) base pair which is located either immediately upstream of and contiguous with or immediately downstream of and contiguous with the original foreign insert DNA molecule. Transformation procedures leading
30 to random integration of the foreign DNA will result in transformants containing different flanking regions characteristic and unique for each transformant. When recombinant DNA is introduced into a plant through traditional crossing, its flanking regions will generally not be

changed. Transformants will also contain unique junctions between a piece of heterologous insert DNA and genomic DNA, or two (2) pieces of genomic DNA, or two (2) pieces of heterologous DNA. A "junction" is a point where two (2) specific DNA fragments join. For example, a junction exists where insert DNA joins flanking DNA. A junction point also exists
5 in a transformed organism where two (2) DNA fragments join together in a manner that is modified from that found in the native organism. "Junction DNA" refers to DNA that comprises a junction point.

As used herein, "heterologous" in reference to a nucleic acid is a nucleic acid that originates from a foreign species, or, if from the same species, is substantially modified from
10 its native form in composition and/or genomic locus by deliberate human intervention. For example, a promoter operably linked to a heterologous nucleotide sequence can be from a species different from that from which the nucleotide sequence was derived, or, if from the same species, the promoter is not naturally found operably linked to the nucleotide sequence. A heterologous protein may originate from a foreign species, or, if from the same species, is
15 substantially modified from its original form by deliberate human intervention.

"Regulatory sequences" refer to nucleotide sequences located upstream (5' non-coding sequences), within, or downstream (3' non-coding sequences) of a coding sequence, and which influence the transcription, RNA processing or stability, or translation of the associated coding sequence. Regulatory sequences may include promoters, translation leader sequences, introns,
20 and polyadenylation recognition sequences.

"Promoter" refers to a nucleotide sequence capable of controlling the expression of a coding sequence or functional RNA. In general, a coding sequence is located 3' to a promoter sequence. The promoter sequence consists of proximal and more distal upstream elements, the latter elements are often referred to as enhancers. Accordingly, an "enhancer" is a nucleotide
25 sequence that can stimulate promoter activity and may be an innate element of the promoter or a heterologous element inserted to enhance the level or tissue-specificity of a promoter. Promoters may be derived in their entirety from a native gene, or be composed of different elements derived from different promoters found in nature, or even comprise synthetic nucleotide segments. It is understood by those skilled in the art that different promoters may
30 direct the expression of a gene in different tissues or cell types, or at different stages of development, or in response to different environmental conditions. Promoters that cause a nucleic acid fragment to be expressed in most cell types at most times are commonly referred

to as “constitutive promoters”. New promoters of various types useful in plant cells are constantly being discovered; numerous examples may be found in the compilation by Okamuro and Goldberg (1989) *Biochemistry of Plants* 15:1-82. It is further recognized that since in most cases the exact boundaries of regulatory sequences have not been completely defined, nucleic acid fragments of different lengths may have identical promoter activity.

The “translation leader sequence” refers to a nucleotide sequence located between the promoter sequence of a gene and the coding sequence. The translation leader sequence is present in the fully processed mRNA upstream of the translation start sequence. The translation leader sequence may affect numerous parameters including, processing of the primary transcript to mRNA, mRNA stability and/or translation efficiency. Examples of translation leader sequences have been described (Turner and Foster (1995) *Mol. Biotechnol.* 3:225-236).

The “3’ non-coding sequences” refer to nucleotide sequences located downstream of a coding sequence and include polyadenylation recognition sequences and other sequences encoding regulatory signals capable of affecting mRNA processing or gene expression. The polyadenylation signal is usually characterized by affecting the addition of polyadenylic acid tracts to the 3’ end of the mRNA precursor. The use of different 3’ non-coding sequences is exemplified by Ingelbrecht *et al.* (1989) *Plant Cell* 1:671-680.

A “protein” or “polypeptide” is a chain of amino acids arranged in a specific order determined by the coding sequence in a polynucleotide encoding the polypeptide.

A DNA construct is an assembly of DNA molecules linked together that provide one or more expression cassettes. The DNA construct may be a plasmid that is enabled for self replication in a bacterial cell and contains various endonuclease enzyme restriction sites that are useful for introducing DNA molecules that provide functional genetic elements, i.e., promoters, introns, leaders, coding sequences, 3’ termination regions, among others; or a DNA construct may be a linear assembly of DNA molecules, such as an expression cassette. The expression cassette contained within a DNA construct comprise the necessary genetic elements to provide transcription of a messenger RNA. The expression cassette can be designed to express in prokaryote cells or eukaryotic cells. Expression cassettes of the embodiments of the present invention are designed to express in plant cells.

The DNA molecules of embodiments of the invention are provided in expression cassettes for expression in an organism of interest. The cassette will include 5’ and 3’

regulatory sequences operably linked to a coding sequence. "Operably linked" means that the nucleic acid sequences being linked are contiguous and, where necessary to join two protein coding regions, contiguous and in the same reading frame. Operably linked is intended to indicate a functional linkage between a promoter and a second sequence, wherein the promoter
5 sequence initiates and mediates transcription of the DNA sequence corresponding to the second sequence. The cassette may additionally contain at least one additional gene to be cotransformed into the organism. Alternatively, the additional gene(s) can be provided on multiple expression cassettes or multiple DNA constructs.

The expression cassette will include in the 5' to 3' direction of transcription: a
10 transcriptional and translational initiation region, a coding region, and a transcriptional and translational termination region functional in the organism serving as a host. The transcriptional initiation region (*i.e.*, the promoter) may be native or analogous, or foreign or heterologous to the host organism. Additionally, the promoter may be the natural sequence or alternatively a synthetic sequence. The expression cassettes may additionally contain 5' leader
15 sequences in the expression cassette construct. Such leader sequences can act to enhance translation.

It is to be understood that as used herein the term "transgenic" includes any cell, cell line, callus, tissue, plant part, or plant, the genotype of which has been altered by the presence of a heterologous nucleic acid including those transgenics initially so altered as well as those
20 created by sexual crosses or asexual propagation from the initial transgenic. The term "transgenic" as used herein does not encompass the alteration of the genome (chromosomal or extra-chromosomal) by conventional plant breeding methods or by naturally occurring events such as random cross-fertilization, non-recombinant viral infection, non-recombinant bacterial transformation, non-recombinant transposition, or spontaneous mutation.

A transgenic "event" is produced by transformation of plant cells with a heterologous DNA construct(s), including a nucleic acid expression cassette that comprises a transgene of interest, the regeneration of a population of plants resulting from the insertion of the transgene into the genome of the plant, and selection of a particular plant characterized by insertion into a particular genome location. An event is characterized phenotypically by the expression of the
25 transgene. At the genetic level, an event is part of the genetic makeup of a plant. The term "event" also refers to progeny produced by a sexual outcross between the transformant and another variety that include the heterologous DNA. Even after repeated back-crossing to a
30

recurrent parent, the inserted DNA and flanking DNA from the transformed parent is present in the progeny of the cross at the same chromosomal location. The term "event" also refers to DNA from the original transformant comprising the inserted DNA and flanking sequence immediately adjacent to the inserted DNA that would be expected to be transferred to a progeny that receives inserted DNA including the transgene of interest as the result of a sexual cross of one parental line that includes the inserted DNA (e.g., the original transformant and progeny resulting from selfing) and a parental line that does not contain the inserted DNA.

An insect resistant DAS-59122-7 corn plant can be bred by first sexually crossing a first parental corn plant consisting of a corn plant grown from the transgenic DAS-59122-7 corn plant and progeny thereof derived from transformation with the expression cassettes of the embodiments of the present invention that confers insect resistance, and a second parental corn plant that lacks insect resistance, thereby producing a plurality of first progeny plants; and then selecting a first progeny plant that is resistant to insects; and selfing the first progeny plant, thereby producing a plurality of second progeny plants; and then selecting from the second progeny plants an insect resistant plant. These steps can further include the back-crossing of the first insect resistant progeny plant or the second insect resistant progeny plant to the second parental corn plant or a third parental corn plant, thereby producing a corn plant that is resistant to insects.

As used herein, the term "plant" includes reference to whole plants, plant organs (e.g., leaves, stems, roots, etc.), seeds, plant cells, and progeny of same. Parts of transgenic plants understood to be within the scope of the invention comprise, for example, plant cells, protoplasts, tissues, callus, embryos as well as flowers, stems, fruits, leaves, and roots originating in transgenic plants or their progeny previously transformed with a DNA molecule of the invention and therefore consisting at least in part of transgenic cells, are also an embodiment of the present invention.

As used herein, the term "plant cell" includes, without limitation, seeds, suspension cultures, embryos, meristematic regions, callus tissue, leaves, roots, shoots, gametophytes, sporophytes, pollen, and microspores. The class of plants that can be used in the methods of the invention is generally as broad as the class of higher plants amenable to transformation techniques, including both monocotyledonous and dicotyledonous plants.

"Transformation" refers to the transfer of a nucleic acid fragment into the genome of a host organism, resulting in genetically stable inheritance. Host organisms containing the

transformed nucleic acid fragments are referred to as “transgenic” organisms. Examples of methods of plant transformation include *Agrobacterium*-mediated transformation (De Blaere *et al.* (1987) *Meth. Enzymol.* 143:277) and particle-accelerated or “gene gun” transformation technology (Klein *et al.* (1987) *Nature* (London) 327:70-73; U.S. Patent No. 4,945,050, incorporated herein by reference). Additional transformation methods are disclosed below.

Thus, isolated polynucleotides of the invention can be incorporated into recombinant constructs, typically DNA constructs, which are capable of introduction into and replication in a host cell. Such a construct can be a vector that includes a replication system and sequences that are capable of transcription and translation of a polypeptide-encoding sequence in a given host cell. A number of vectors suitable for stable transfection of plant cells or for the establishment of transgenic plants have been described in, e.g., Pouwels *et al.*, (1985; Supp. 1987) *Cloning Vectors: A Laboratory Manual*, Weissbach and Weissbach (1989) *Methods for Plant Molecular Biology*, (Academic Press, New York); and Flevin *et al.*, (1990) *Plant Molecular Biology Manual*, (Kluwer Academic Publishers). Typically, plant expression vectors include, for example, one or more cloned plant genes under the transcriptional control of 5’ and 3’ regulatory sequences and a dominant selectable marker. Such plant expression vectors also can contain a promoter regulatory region (e.g., a regulatory region controlling inducible or constitutive, environmentally- or developmentally-regulated, or cell- or tissue-specific expression), a transcription initiation start site, a ribosome binding site, an RNA processing signal, a transcription termination site, and/or a polyadenylation signal.

It is also to be understood that two different transgenic plants can also be mated to produce offspring that contain two independently segregating added, exogenous genes. Selfing of appropriate progeny can produce plants that are homozygous for both added, exogenous genes. Back-crossing to a parental plant and out-crossing with a non-transgenic plant are also contemplated, as is vegetative propagation. Descriptions of other breeding methods that are commonly used for different traits and crops can be found in one of several references, e.g., Fehr, in *Breeding Methods for Cultivar Development*, Wilcos J. ed., American Society of Agronomy, Madison Wis. (1987).

A “probe” is an isolated nucleic acid to which is attached a conventional detectable label or reporter molecule, e.g., a radioactive isotope, ligand, chemiluminescent agent, or enzyme. Such a probe is complementary to a strand of a target nucleic acid, in the case of the present invention, to a strand of isolated DNA from corn event DAS-59122-7 whether from a

corn plant or from a sample that includes DNA from the event. Probes according to the present invention include not only deoxyribonucleic or ribonucleic acids but also polyamides and other probe materials that bind specifically to a target DNA sequence and can be used to detect the presence of that target DNA sequence.

5 “Primers” are isolated nucleic acids that are annealed to a complementary target DNA strand by nucleic acid hybridization to form a hybrid between the primer and the target DNA strand, then extended along the target DNA strand by a polymerase, e.g., a DNA polymerase. Primer pairs of the invention refer to their use for amplification of a target nucleic acid sequence, e.g., by the polymerase chain reaction (PCR) or other conventional nucleic-acid
10 amplification methods. “PCR” or “polymerase chain reaction” is a technique used for the amplification of specific DNA segments (see, U.S. Patent Nos. 4,683,195 and 4,800,159; herein incorporated by reference).

 Probes and primers are of sufficient nucleotide length to bind to the target DNA sequence specifically in the hybridization conditions or reaction conditions determined by the
15 operator. This length may be of any length that is of sufficient length to be useful in a detection method of choice. Generally, eleven (11) nucleotides or more in length, eighteen (18) nucleotides or more, and twenty-two (22) nucleotides or more, are used. Such probes and primers hybridize specifically to a target sequence under high stringency hybridization conditions. Probes and primers according to embodiments of the present invention may have
20 complete DNA sequence similarity of contiguous nucleotides with the target sequence, although probes differing from the target DNA sequence and that retain the ability to hybridize to target DNA sequences may be designed by conventional methods. Probes can be used as primers, but are generally designed to bind to the target DNA or RNA and are not used in an amplification process.

25 Specific primers can be used to amplify an integration fragment to produce an amplicon that can be used as a “specific probe” for identifying event DAS-59122-7 in biological samples. When the probe is hybridized with the nucleic acids of a biological sample under conditions which allow for the binding of the probe to the sample, this binding can be detected and thus allow for an indication of the presence of event DAS-59122-7 in the biological sample. Such
30 identification of a bound probe has been described in the art. In an embodiment of the invention the specific probe is a sequence which, under optimized conditions, hybridizes specifically to a region within the 5’ or 3’ flanking region of the event and also comprises a part

of the foreign DNA contiguous therewith. The specific probe may comprise a sequence of at least 80%, between 80 and 85%, between 85 and 90%, between 90 and 95%, and between 95 and 100% identical (or complementary) to a specific region of the event.

Methods for preparing and using probes and primers are described, for example, in
5 *Molecular Cloning: A Laboratory Manual*, 2nd ed., vol. 1-3, ed. Sambrook *et al.*, Cold Spring Harbor Laboratory Press, Cold Spring Harbor, N.Y. 1989 (hereinafter, "Sambrook *et al.*, 1989"); *Current Protocols in Molecular Biology*, ed. Ausubel *et al.*, Greene Publishing and Wiley-Interscience, New York, 1992 (with periodic updates) (hereinafter, "Ausubel *et al.*, 1992"); and Innis *et al.*, *PCR Protocols: A Guide to Methods and Applications*, Academic
10 Press: San Diego, 1990. PCR primer pairs can be derived from a known sequence, for example, by using computer programs intended for that purpose such as the PCR primer analysis tool in Vector NTI version 6 (Informax Inc., Bethesda MD); PrimerSelect (DNASTAR Inc., Madison, WI); and Primer (Version 0.5[®], 1991, Whitehead Institute for Biomedical Research, Cambridge, Mass.). Additionally, the sequence can be visually scanned and primers
15 manually identified using guidelines known to one of skill in the art.

A "kit" as used herein refers to a set of reagents for the purpose of performing the method embodiments of the invention, more particularly, the identification of the event DAS-59122-7 in biological samples. The kit of the invention can be used, and its components can be specifically adjusted, for purposes of quality control (e.g. purity of seed lots), detection of event
20 DAS-59122-7 in plant material, or material comprising or derived from plant material, such as but not limited to food or feed products. "Plant material" as used herein refers to material which is obtained or derived from a plant.

Primers and probes based on the flanking DNA and insert sequences disclosed herein can be used to confirm (and, if necessary, to correct) the disclosed sequences by conventional
25 methods, e.g., by re-cloning and sequencing such sequences. The nucleic acid probes and primers of the present invention hybridize under stringent conditions to a target DNA sequence. Any conventional nucleic acid hybridization or amplification method can be used to identify the presence of DNA from a transgenic event in a sample. Nucleic acid molecules or fragments thereof are capable of specifically hybridizing to other nucleic acid molecules under certain
30 circumstances. As used herein, two nucleic acid molecules are said to be capable of specifically hybridizing to one another if the two molecules are capable of forming an anti-parallel, double-stranded nucleic acid structure.

A nucleic acid molecule is said to be the “complement” of another nucleic acid molecule if they exhibit complete complementarity. As used herein, molecules are said to exhibit “complete complementarity” when every nucleotide of one of the molecules is complementary to a nucleotide of the other. Two molecules are said to be “minimally complementary” if they can hybridize to one another with sufficient stability to permit them to remain annealed to one another under at least conventional “low-stringency” conditions. Similarly, the molecules are said to be “complementary” if they can hybridize to one another with sufficient stability to permit them to remain annealed to one another under conventional “high-stringency” conditions. Conventional stringency conditions are described by Sambrook *et al.*, 1989, and by Haymes *et al.*, In: *Nucleic Acid Hybridization, a Practical Approach*, IRL Press, Washington, D.C. (1985), departures from complete complementarity are therefore permissible, as long as such departures do not completely preclude the capacity of the molecules to form a double-stranded structure. In order for a nucleic acid molecule to serve as a primer or probe it need only be sufficiently complementary in sequence to be able to form a stable double-stranded structure under the particular solvent and salt concentrations employed.

In hybridization reactions, specificity is typically the function of post-hybridization washes, the critical factors being the ionic strength and temperature of the final wash solution. The thermal melting point (T_m) is the temperature (under defined ionic strength and pH) at which 50% of a complementary target sequence hybridizes to a perfectly matched probe. For DNA-DNA hybrids, the T_m can be approximated from the equation of Meinkoth and Wahl (1984) *Anal. Biochem.* 138:267-284: $T_m = 81.5^{\circ}\text{C} + 16.6 (\log M) + 0.41 (\%GC) - 0.61 (\% \text{ form}) - 500/L$; where M is the molarity of monovalent cations, %GC is the percentage of guanosine and cytosine nucleotides in the DNA, % form is the percentage of formamide in the hybridization solution, and L is the length of the hybrid in base pairs. T_m is reduced by about 1°C for each 1% of mismatching; thus, T_m , hybridization, and/or wash conditions can be adjusted to hybridize to sequences of the desired identity. For example, if sequences with >90% identity are sought, the T_m can be decreased 10°C. Generally, stringent conditions are selected to be about 5°C lower than the T_m for the specific sequence and its complement at a defined ionic strength and pH. However, severely stringent conditions can utilize a hybridization and/or wash at 1, 2, 3, or 4°C lower than the T_m ; moderately stringent conditions can utilize a hybridization and/or wash at 6, 7, 8, 9, or 10°C lower than the T_m ; low stringency

conditions can utilize a hybridization and/or wash at 11, 12, 13, 14, 15, or 20°C lower than the T_m.

Using the equation, hybridization and wash compositions, and desired T_m, those of ordinary skill will understand that variations in the stringency of hybridization and/or wash solutions are inherently described. If the desired degree of mismatching results in a T_m of less than 45°C (aqueous solution) or 32°C (formamide solution), it is preferred to increase the SSC concentration so that a higher temperature can be used. An extensive guide to the hybridization of nucleic acids is found in Tijssen (1993) *Laboratory Techniques in Biochemistry and Molecular Biology—Hybridization with Nucleic Acid Probes*, Part I, Chapter 2 (Elsevier, New York); and Ausubel *et al.*, eds. (1995) *Current Protocols in Molecular Biology*, Chapter 2 (Greene Publishing and Wiley-Interscience, New York). See Sambrook *et al.* (1989) *Molecular Cloning: A Laboratory Manual* (2d ed., Cold Spring Harbor Laboratory Press, Plainview, New York).

As used herein, a substantially homologous sequence is a nucleic acid molecule that will specifically hybridize to the complement of the nucleic acid molecule to which it is being compared under high stringency conditions. Appropriate stringency conditions which promote DNA hybridization, for example, 6X sodium chloride/sodium citrate (SSC) at about 45°C, followed by a wash of 2X SSC at 50°C, are known to those skilled in the art or can be found in *Current Protocols in Molecular Biology*, John Wiley & Sons, N.Y. (1989), 6.3.1-6.3.6. Typically, stringent conditions will be those in which the salt concentration is less than about 1.5 M Na ion, typically about 0.01 to 1.0 M Na ion concentration (or other salts) at pH 7.0 to 8.3 and the temperature is at least about 30°C for short probes (e.g., 10 to 50 nucleotides) and at least about 60°C for long probes (e.g., greater than 50 nucleotides). Stringent conditions may also be achieved with the addition of a destabilizing agent such as formamide. Exemplary low stringency conditions include hybridization with a buffer solution of 30 to 35% formamide, 1 M NaCl, 1% SDS (sodium dodecyl sulphate) at 37°C, and a wash in 1X to 2X SSC (20X SSC = 3.0 M NaCl/0.3 M trisodium citrate) at 50 to 55°C. Exemplary moderate stringency conditions include hybridization in 40 to 45% formamide, 1 M NaCl, 1% SDS at 37°C, and a wash in 0.5X to 1X SSC at 55 to 60°C. Exemplary high stringency conditions include hybridization in 50% formamide, 1 M NaCl, 1% SDS at 37°C, and a wash in 0.1X SSC at 60 to 65°C. A nucleic acid of the invention may specifically hybridize to one or more of the nucleic acid molecules unique

to the DAS-59122-7 event or complements thereof or fragments of either under moderately stringent conditions.

Methods of alignment of sequences for comparison are well known in the art. Thus, the determination of percent identity between any two sequences can be accomplished using a mathematical algorithm. Non-limiting examples of such mathematical algorithms are the
5 algorithm of Myers and Miller (1988) *CABIOS* 4:11-17; the local homology algorithm of Smith *et al.* (1981) *Adv. Appl. Math.* 2:482; the homology alignment algorithm of Needleman and Wunsch (1970) *J. Mol. Biol.* 48:443-453; the search-for-similarity-method of Pearson and Lipman (1988) *Proc. Natl. Acad. Sci.* 85:2444-2448; the algorithm of Karlin and Altschul
10 (1990) *Proc. Natl. Acad. Sci. USA* 87:2264, modified as in Karlin and Altschul (1993) *Proc. Natl. Acad. Sci. USA* 90:5873-5877.

Computer implementations of these mathematical algorithms can be utilized for comparison of sequences to determine sequence identity. Such implementations include, but are not limited to: CLUSTAL in the PC/Gene program (available from Intelligenetics,
15 Mountain View, California); the ALIGN program (Version 2.0); the ALIGN PLUS program (version 3.0, copyright 1997); and GAP, BESTFIT, BLAST, FASTA, and TFASTA in the Wisconsin Genetics Software Package, Version 10 (available from Accelrys, 9685 Scranton Road, San Diego, CA 92121, USA). Alignments using these programs can be performed using the default parameters.

The CLUSTAL program is well described by Higgins and Sharp, *Gene* 73: 237-244
20 (1988); Higgins and Sharp, *CABIOS* 5: 151-153 (1989); Corpet, *et al.*, *Nucleic Acids Research* 16: 10881-90 (1988); Huang, *et al.*, *Computer Applications in the Biosciences* 8: 155-65 (1992), and Pearson, *et al.*, *Methods in Molecular Biology* 24: 307-331 (1994). The ALIGN and the ALIGN PLUS programs are based on the algorithm of Myers and Miller (1988) *supra*.
25 The BLAST programs of Altschul *et al.* (1990) *J. Mol. Biol.* 215:403 are based on the algorithm of Karlin and Altschul (1990) *supra*. The BLAST family of programs which can be used for database similarity searches includes: BLASTN for nucleotide query sequences against nucleotide database sequences; BLASTX for nucleotide query sequences against protein database sequences; BLASTP for protein query sequences against protein database
30 sequences; TBLASTN for protein query sequences against nucleotide database sequences; and TBLASTX for nucleotide query sequences against nucleotide database sequences. See, *Current Protocols in Molecular Biology*, Chapter 19, Ausubel, *et al.*, Eds., Greene Publishing

and Wiley-Interscience, New York (1995). Alignment may also be performed manually by visual inspection.

To obtain gapped alignments for comparison purposes, Gapped BLAST (in BLAST 2.0) can be utilized as described in Altschul *et al.* (1997) *Nucleic Acids Res.* 25:3389.

5 Alternatively, PSI-BLAST (in BLAST 2.0) can be used to perform an iterated search that detects distant relationships between molecules. See Altschul *et al.* (1997) *supra*. When utilizing BLAST, Gapped BLAST, PSI-BLAST, the default parameters of the respective programs (e.g., BLASTN for nucleotide sequences, BLASTX for proteins) can be used. See www.ncbi.nlm.nih.gov.

10 As used herein, “sequence identity” or “identity” in the context of two nucleic acid or polypeptide sequences makes reference to the residues in the two sequences that are the same when aligned for maximum correspondence over a specified comparison window. When percentage of sequence identity is used in reference to proteins it is recognized that residue positions which are not identical often differ by conservative amino acid substitutions, where
15 amino acid residues are substituted for other amino acid residues with similar chemical properties (e.g., charge or hydrophobicity) and therefore do not change the functional properties of the molecule. When sequences differ in conservative substitutions, the percent sequence identity may be adjusted upwards to correct for the conservative nature of the substitution. Sequences that differ by such conservative substitutions are said to have
20 “sequence similarity” or “similarity”. Means for making this adjustment are well known to those of skill in the art. Typically this involves scoring a conservative substitution as a partial rather than a full mismatch, thereby increasing the percentage sequence identity. Thus, for example, where an identical amino acid is given a score of 1 and a non-conservative substitution is given a score of zero, a conservative substitution is given a score between zero
25 and 1. The scoring of conservative substitutions is calculated, e.g., as implemented in the program PC/GENE (Intelligenetics, Mountain View, California).

As used herein, “percentage of sequence identity” means the value determined by comparing two optimally aligned sequences over a comparison window, wherein the portion of the polynucleotide sequence in the comparison window may comprise additions or deletions
30 (i.e., gaps) as compared to the reference sequence (which does not comprise additions or deletions) for optimal alignment of the two sequences. The percentage is calculated by determining the number of positions at which the identical nucleic acid base or amino acid

residue occurs in both sequences to yield the number of matched positions, dividing the number of matched positions by the total number of positions in the window of comparison, and multiplying the result by 100 to yield the percentage of sequence identity.

Regarding the amplification of a target nucleic acid sequence (e.g., by PCR) using a particular amplification primer pair, "stringent conditions" are conditions that permit the primer pair to hybridize only to the target nucleic-acid sequence to which a primer having the corresponding wild-type sequence (or its complement) would bind and preferably to produce a unique amplification product, the amplicon, in a DNA thermal amplification reaction.

The term "specific for (a target sequence)" indicates that a probe or primer hybridizes under stringent hybridization conditions only to the target sequence in a sample comprising the target sequence.

As used herein, "amplified DNA" or "amplicon" refers to the product of nucleic acid amplification of a target nucleic acid sequence that is part of a nucleic acid template. For example, to determine whether a corn plant resulting from a sexual cross contains transgenic event genomic DNA from the corn plant of the invention, DNA extracted from the corn plant tissue sample may be subjected to a nucleic acid amplification method using a DNA primer pair that includes a first primer derived from flanking sequence adjacent to the insertion site of inserted heterologous DNA, and a second primer derived from the inserted heterologous DNA to produce an amplicon that is diagnostic for the presence of the event DNA. Alternatively, the second primer may be derived from the flanking sequence. The amplicon is of a length and has a sequence that is also diagnostic for the event. The amplicon may range in length from the combined length of the primer pairs plus one nucleotide base pair to any length of amplicon producible by a DNA amplification protocol. Alternatively, primer pairs can be derived from flanking sequence on both sides of the inserted DNA so as to produce an amplicon that includes the entire insert nucleotide sequence of the PHI17662A expression construct as well as the sequence flanking the transgenic insert, see FIG. 1 (SEQ ID NO: 23), approximately twelve (12) Kb in size. A member of a primer pair derived from the flanking sequence may be located a distance from the inserted DNA sequence, this distance can range from one nucleotide base pair up to the limits of the amplification reaction, or about twenty thousand nucleotide base pairs. The use of the term "amplicon" specifically excludes primer dimers that may be formed in the DNA thermal amplification reaction.

Nucleic acid amplification can be accomplished by any of the various nucleic acid amplification methods known in the art, including the polymerase chain reaction (PCR). A variety of amplification methods are known in the art and are described, inter alia, in U.S. Pat. Nos. 4,683,195 and 4,683,202 and in *PCR Protocols: A Guide to Methods and Applications*, ed. Innis *et al.*, Academic press, San Diego, 1990. PCR amplification methods have been developed to amplify up to 22 Kb of genomic DNA and up to 42 Kb of bacteriophage DNA (Cheng *et al.*, *Proc. Natl. Acad. Sci. USA* 91:5695-5699, 1994). These methods as well as other methods known in the art of DNA amplification may be used in the practice of the embodiments of the present invention. It is understood that a number of parameters in a specific PCR protocol may need to be adjusted to specific laboratory conditions and may be slightly modified and yet allow for the collection of similar results. These adjustments will be apparent to a person skilled in the art.

The amplicon produced by these methods may be detected by a plurality of techniques, including, but not limited to, Genetic Bit Analysis (Nikiforov, *et al. Nucleic Acid Res.* 22:4167-4175, 1994) where a DNA oligonucleotide is designed which overlaps both the adjacent flanking DNA sequence and the inserted DNA sequence. The oligonucleotide is immobilized in wells of a microwell plate. Following PCR of the region of interest (using one primer in the inserted sequence and one in the adjacent flanking sequence) a single-stranded PCR product can be hybridized to the immobilized oligonucleotide and serve as a template for a single base extension reaction using a DNA polymerase and labeled ddNTPs specific for the expected next base. Readout may be fluorescent or ELISA-based. A signal indicates presence of the insert/flanking sequence due to successful amplification, hybridization, and single base extension.

Another detection method is the Pyrosequencing technique as described by Winge (Innov. Pharma. Tech. 00: 18-24, 2000). In this method an oligonucleotide is designed that overlaps the adjacent DNA and insert DNA junction. The oligonucleotide is hybridized to a single-stranded PCR product from the region of interest (one primer in the inserted sequence and one in the flanking sequence) and incubated in the presence of a DNA polymerase, ATP, sulfurylase, luciferase, apyrase, adenosine 5' phosphosulfate and luciferin. dNTPs are added individually and the incorporation results in a light signal which is measured. A light signal indicates the presence of the transgene insert/flanking sequence due to successful amplification, hybridization, and single or multi-base extension.

Fluorescence Polarization as described by Chen *et al.*, (*Genome Res.* 9:492-498, 1999) is also a method that can be used to detect an amplicon of the invention. Using this method an oligonucleotide is designed which overlaps the flanking and inserted DNA junction. The oligonucleotide is hybridized to a single-stranded PCR product from the region of interest (one primer in the inserted DNA and one in the flanking DNA sequence) and incubated in the presence of a DNA polymerase and a fluorescent-labeled ddNTP. Single base extension results in incorporation of the ddNTP. Incorporation can be measured as a change in polarization using a fluorometer. A change in polarization indicates the presence of the transgene insert/flanking sequence due to successful amplification, hybridization, and single base extension.

Taqman[®] (PE Applied Biosystems, Foster City, Calif.) is described as a method of detecting and quantifying the presence of a DNA sequence and is fully understood in the instructions provided by the manufacturer. Briefly, a FRET oligonucleotide probe is designed which overlaps the flanking and insert DNA junction. The FRET probe and PCR primers (one primer in the insert DNA sequence and one in the flanking genomic sequence) are cycled in the presence of a thermostable polymerase and dNTPs. Hybridization of the FRET probe results in cleavage and release of the fluorescent moiety away from the quenching moiety on the FRET probe. A fluorescent signal indicates the presence of the flanking/transgene insert sequence due to successful amplification and hybridization.

Molecular Beacons have been described for use in sequence detection as described in Tyangi *et al.* (*Nature Biotech.* 14:303-308, 1996). Briefly, a FRET oligonucleotide probe is designed that overlaps the flanking and insert DNA junction. The unique structure of the FRET probe results in it containing secondary structure that keeps the fluorescent and quenching moieties in close proximity. The FRET probe and PCR primers (one primer in the insert DNA sequence and one in the flanking sequence) are cycled in the presence of a thermostable polymerase and dNTPs. Following successful PCR amplification, hybridization of the FRET probe to the target sequence results in the removal of the probe secondary structure and spatial separation of the fluorescent and quenching moieties. A fluorescent signal results. A fluorescent signal indicates the presence of the flanking/transgene insert sequence due to successful amplification and hybridization.

A hybridization reaction using a probe specific to a sequence found within the amplicon is yet another method used to detect the amplicon produced by a PCR reaction.

Embodiments of the present invention are further defined in the following Examples. It should be understood that these Examples are given by way of illustration only. From the above discussion and these Examples, one skilled in the art can ascertain the essential characteristics of this invention, and without departing from the spirit and scope thereof, can make various changes and modifications of the embodiments of the invention to adapt it to various usages and conditions. Thus, various modifications of the embodiments of the invention, in addition to those shown and described herein, will be apparent to those skilled in the art from the foregoing description. Such modifications are also intended to fall within the scope of the appended claims.

The disclosure of each reference set forth herein is incorporated herein by reference in its entirety.

EXAMPLES

Example 1. Transformation of Maize by *Agrobacterium* transformation and Regeneration of Transgenic Plants Containing the Cry34Ab1 and Cry35Ab1 (Cry34/35Ab1) Genes

A DNA molecule of approximately 7.4 Kb, designated PHI17662A (SEQ ID NO: 24), which includes a first transgene expression cassette comprising a DNA molecule which includes the promoter, 5' untranslated exon, and first intron of the maize ubiquitin (Ubi-1) gene (Christensen *et al.* (1992) *Plant Mol. Biol.* 18:675-689 and Christensen and Quail (1996) *Transgenic Res.* 5:213-218) operably connected to a DNA molecule encoding a *B.t.* δ -endotoxin identified as Cry34Ab1 (U.S. Pat. Nos. 6,127,180, 6,624,145 and 6,340,593) operably connected to a DNA molecule comprising a Pin II transcriptional terminator isolated from potato (Gyheung An *et al.* (1989) *Plant Cell.* 1:115-122). The second transgene expression cassette of the DNA construct comprises a DNA molecule encoding the wheat peroxidase promoter (Hertig *et al.* (1991) *Plant Mol. Biol.* 16:171-174) operably connected to a DNA molecule encoding a *B.t.* δ -endotoxin identified as Cry35Ab1 (U.S. Pat. Nos. 6,083,499, 6,548,291 and 6,340,593) operably connected to a DNA molecule comprising a Pin II transcriptional terminator isolated from potato (Gyheung An *et al.* (1989) *Plant Cell.* 1:115-122). The third transgene expression cassette of the DNA construct comprises a DNA molecule of the cauliflower mosaic virus (CaMV) 35S promoter (Odell J.T. *et al.* (1985) *Nature* 313: 810-812; Mitsuhashi *et al.* (1996) *Plant Cell Physiol.* 37: 49-59) operably

connected to a DNA molecule encoding a phosphinothricin acetyltransferase (PAT) gene (Wohlleben W. *et al.* (1988) *Gene* 70: 25-37) operably connected to a DNA molecule comprising a 3' transcriptional terminator from (CaMV) 35S (see Mitsuhara *et al.* (1996) *Plant Cell Physiol.* 37: 49-59) was used to transform maize embryo tissue.

5 *B.t.* Cry34/35 Ab1 maize plants were obtained by *Agrobacterium* transformation, the method of Zhao was employed (U.S. Patent No. 5,981,840, and PCT patent publication WO98/32326; the contents of which are hereby incorporated by reference). Briefly, immature embryos were isolated from maize and the embryos contacted with a suspension of *Agrobacterium*, where the bacteria was capable of transferring PH117662 DNA (SEQ ID
10 NO:24) to at least one cell of at least one of the immature embryos (step 1: the infection step). Specifically, in this step the immature embryos were immersed in an *Agrobacterium* suspension for the initiation of inoculation. The embryos were co-cultured for a time with the *Agrobacterium* (step 2: the co-cultivation step). Specifically, the immature embryos were cultured on solid medium following the infection step. Following this co-cultivation period a
15 "resting" step was provided. In this resting step, the embryos were incubated in the presence of at least one antibiotic known to inhibit the growth of *Agrobacterium* without the addition of a selective agent for plant transformants (step 3: resting step). In particular, the immature embryos are cultured on solid medium with antibiotic, but without a selecting agent, for elimination of *Agrobacterium* and for a resting phase for the infected cells. Next, inoculated
20 embryos were cultured on medium containing a selective agent and growing transformed callus was recovered (step 4: the selection step). Specifically, the immature embryos were cultured on solid medium with a selective agent resulting in the selective growth of transformed cells. The callus was then regenerated into plants (step 5: the regeneration step), and, specifically, calli grown on selective medium were cultured on solid medium to regenerate the plants.
25 Individual embryos were kept physically separate during culture, and the majority of explants died on the selective medium.

Those embryos that survived and produced healthy, glufosinate-resistant callus tissue were assigned unique identification codes representing putative transformation events, and continually transferred to fresh selection medium. Plants were regenerated from tissue derived
30 from each unique event and transferred to the greenhouse. Leaf samples were taken for molecular analysis to verify the presence of the transgene by PCR and to confirm expression of the Cry34/35Ab1 protein by ELISA. Plants were then subjected to a whole plant bioassay

using western corn rootworm insects. Positive plants were crossed with inbred lines to obtain seed from the initial transformed plants. A number of lines were evaluated in the field. The DAS-59122-7 event was selected from a population of independent transgenic events based on a superior combination of characteristics, including insect resistance and agronomic performance.

Example 2. Identification of *Bacillus thuringiensis* Cry34/35Ab1 maize line DAS-59122-7

Seed from event DAS-59122-7 was evaluated. The T1S2 seed represents transformation into the Hi-II background, followed by a cross with inbred line PH09B and two rounds of self-crossing. All seed were obtained from Pioneer Hi-Bred (Johnston, IA). Primary characterization was conducted on plant leaf tissue during the study by confirmation of phosphinothricin acetyltransferase (PAT) activity via herbicide leaf painting and Cry34Ab1 expression using lateral flow devices.

Control substances in this study were defined as unmodified seed representative of the test substance background. Control seeds of Hi-II and PH09B backgrounds were used as negative controls. These unmodified seed do not contain the plant transcription units for the *cry34Ab1*, *cry35Ab1*, and *pat* genes. All seed were obtained from Pioneer Hi-Bred (Johnston, IA).

DNA samples from two additional B.t. Cry34/35Ab1 events, event DAS-45214-4 and event DAS-45216-6, were used as negative controls for event specific PCR analysis. The two events were produced through Agrobacterium transformation using the same vector used to produce event DAS-59122-7 and therefore contained the plant transcription units for the *cry34Ab1*, *cry35Ab1*, and *pat* genes. However, the insertion sites of the T-DNA in events DAS-45214-4 and DAS-45216-6, including genomic DNA border regions, were different from that in event DAS-59122-7. DNA samples from event DAS-45214-4 and event DAS-45216-6 were isolated and characterized by Southern blot analysis. (Data not shown.)

Corn seed for event DAS-59122-7 and unmodified control seed (Hi-II and PH09B) were planted in growth chambers at the DuPont Experimental Station (Wilmington, DE) to produce sufficient numbers of plants for DNA analysis. For characterization of event DAS-59122-7, ten (10) T1S2 seeds were planted. Ten (10) seeds were also planted for each unmodified control line. One (1) seed was planted per pot, and the pot was uniquely identified.

Planting and growing conditions were conducive to healthy plant growth including regulated light and water.

Leaf samples were collected for each of the control and event DAS-59122-7 plants. For each sample, sufficient leaf material from above the growing point was collected and placed in a pre-labeled sample bag. The samples were placed on dry ice and were transferred to an ultralow freezer following collection. All samples were maintained frozen until processing. All leaf samples were uniquely labeled with the plant identifier and the date of harvest.

To confirm the expression of the Cry34Ab1 protein in event DAS-59122-7 and the absence of expression in the controls, leaf samples were collected from all event DAS-59122-7 and control plants, and screened for transgenic protein using lateral flow devices specific for Cry34Ab1 (Strategic Diagnostics, Inc., Newark, DE). Leaf punches were taken from each plant and ground in a phosphate buffered saline solution with Tween 20 to crudely extract the protein. A strip device was dipped into the extract to determine the presence or absence of the Cry34Ab1 protein. The immunoassay results were used to confirm the identity of the test substance plants prior to molecular analysis as shown in Table 1.

To confirm the expression of phosphinothricin acetyltransferase (PAT) in event DAS-59122-7 plants, herbicide leaf painting was conducted. All plants used in this study were leaf painted to confirm plant identity. Plants were assayed prior to the R1 growth stage. Assays were conducted following a standard procedure known in the art for herbicide leaf painting for the identification of PAT-expressing transgenic plants. Specifically, a portion of one leaf of each plant was treated with approximately 2% solution of glufosinate herbicide, Basta® (Bayer CropScience) in water and visually checked for brown or necrotic tissue in the painted leaf area 4–12 days after application. Results for each plant were recorded and used to determine expression of PAT in each test plant as shown in Table 1. As shown in Table 1, of the ten (10) plants tested for event DAS-59122-7 T1S2 generation, six (6) plants expressed both Cry34Ab1 and PAT, while four (4) plants did not express either protein. All unmodified controls tested negative for both CryAb1 And PAT assays (data not shown).

Table 1: Cry34Ab1 and PAT Protein Expression and Southern Hybridization Data for *B.t.* Cry34/35Ab1 Event DAS-59122-7

Plant ID	Sample ID	Cry34Ab1 and PAT Expression ¹	Southern Blot <i>cry34Ab1</i> Probe ²	Southern Blot <i>cry35Ab1</i> Probe ²	Southern Blot <i>pat</i> Probe ²
02-122C 1	DAS59122-7 T1S2 1	positive	+	+	+
02-122C 2	DAS59122-7 T1S2 2	positive	+	+	+
02-122C 3	DAS59122-7 T1S2 3	positive	+	+	+
02-122C 4	DAS59122-7 T1S2 4	negative	-	-	-
02-122C 5	DAS59122-7 T1S2 5	positive	+	+	+
02-122C 6	DAS59122-7 T1S2 6	negative	-	-	-
02-122C 7	DAS59122-7 T1S2 7	positive	+	+	+
02-122C 8	DAS59122-7 T1S2 8	negative	-	-	-
02-122C 9	DAS59122-7 T1S2 9	negative	-	-	-
02-122C 10	DAS59122-7 T1S2 10	positive	+	+	+

- 5 ¹. Positive Cry34Ab1 expression indicates detection of protein expression as determined by the immunoassay-based lateral flow device specific for Cry34Ab1 protein detection. Negative indicates no detection of the Cry34Ab1 protein. Positive PAT expression indicates plants that were tolerant to the herbicide treatment and negative indicates plants that were sensitive to the herbicide.
- 10 ². + indicates hybridization signal on Southern blot; - indicates no hybridization signal on Southern blot. The *cry34Ab1* gene probe hybridized to the expected internal T-DNA fragment of 1.915 kb, the *cry35Ab1* gene probe hybridized to the expected internal T-DNA fragment of 2.607 kb, and the *pat* gene probe hybridized to a 3.4 kb border fragment consistent with a single intact T-DNA insertion as determined by Southern blot analysis.
- 15

Example 3. Southern Blot Analysis of *Bacillus thuringiensis* Cry34/35Ab1 maize line DAS-59122-7

One gram quantities of leaf samples were ground under liquid nitrogen, and the genomic DNA was isolated using DNeasy[®] Plant Mini Kit (Qiagen, Valencia, CA) or using a standard Urea Extraction Buffer procedure. Following extraction, the DNA was visualized on

an agarose gel to determine the DNA quality, and was quantified using Pico Green[®] reagent (Molecular Probes, Inc., Eugene, OR) and spectrofluorometric analysis.

The 1 Kb DNA Ladder (Invitrogen, Carlsbad, CA) was used to estimate DNA fragment sizes on agarose gels.

5 Genomic DNA isolated from event DAS-59122-7 plants was digested with *Nco* I and electrophoretically separated, transferred to nylon membranes, and hybridized to the *cry34Ab1*, *cry35Ab1* and *pat* gene probes using standard procedures known in the art. Blots were exposed to X-ray film for one or more time periods to detect hybridizing fragments and to visualize molecular weight standards. Images were then digitally captured by photographing X-ray films
10 and/or by detection with a Lumi-Imager[™] instrument (Roche, Indianapolis, IN). The sizes of detected bands were documented for each probe. Southern blot analysis was used as a means of verifying the presence of the insertion in the test plants and confirming that all plants from event DAS-59122-7 contained the same insertion as shown in Table 1. (Southern blots not shown.) Southern blot analysis indicated that event DAS-59122-7 contained a single insertion
15 consisting of an intact copy of the T-DNA region from plasmid PHP17662, while the null segregants, as determined by the protein expression analysis did not hybridize to the gene probes. Further, event DAS-59122-7 plants expressing the two proteins exhibited identical hybridization patterns on Southern blots (data not shown). Specifically, the *cry34Ab1* gene probe hybridized to the expected internal T-DNA fragment of 1.915 kb, the *cry35Ab1* gene
20 probe hybridized to the expected internal T-DNA fragment of 2.607 kb, and the *pat* gene probe hybridized to a 3.4 kb border fragment consistent with a single intact T-DNA insertion as determined by Southern blot results.

25 Example 4. T-DNA Insert and Flanking Border Region Sequencing of *Bacillus thuringiensis* Cry34/35Ab1 maize line DAS-59122-7

30 The T-DNA insert and flanking border regions were cloned from *B.t.* Cry34/35Ab1 event DAS59122-7 using PCR based methods as diagramed in Figures 2 and 3. Specifically, sequences bordering the 5' and 3' ends of the insert in event DAS-59122-7 were obtained using two genome walking techniques. The first walking method was essentially the method as described for the Universal Genome Walker Kit (BD Biosciences Clontech, Palo Alto, CA), and the second method was conducted according to the splinkerette protocol outlined in Devon

et al., (1995) *Nucleic Acids Research* 23 (9):1644-1645, with modifications as described by Stover (2001), U.C. Irvine (personal communication).

Briefly, genomic DNA was digested with various restriction enzymes (*Dra* I, *Eco*R V, *Pvu* II, *Sma* I and *Stu* I for the Universal Genome Walker method and *Bam*H I, *Eco*R I, *Hind* III, and *Xba* I for the splinkerette method) and then ligated to blunt-end adaptors for the Genome Walker method and to adaptors specific for the restriction enzyme used for the splinkerette method. The adaptors for both genome walking methods were designed to prevent extension of the 3' end of the adaptor during PCR and thus reduce or eliminate nonspecific amplification. The adaptor-ligated genomic DNA fragments were then referred to as genome walker libraries or splinkerette libraries, one library for each restriction enzyme. Libraries were prepared from genomic DNA isolated from three individual T1S2 plants of *B.t.* Cry34/35Ab1 event DAS-59122-7; plants DAS-59122-7 T1S2 1, DAS-59122-7 T1S2 2 and DAS-59122-7 T1S2 10, and from one Hi-II and one PH09B control plant.

Following construction of the libraries, nested PCR amplifications were completed to amplify the target sequence using AdvantageTM-GC Genomic PCR kit (BD Biosciences Clontech, Palo Alto, CA). The primary PCR amplification used one primer with identity to the adaptor and one gene specific primer. The adaptor primer will not amplify a product in the first cycle of the primary PCR and only products from the gene specific primer will be produced. Annealing and amplification from the adaptor primer only occurs after the complementary strand has been produced from the gene specific primer. Following primary PCR amplification, a secondary nested PCR reaction was performed to increase the specificity of the genomic PCR reactions. The nested primers consisted of gene-specific and adaptor-specific sequences internal to the respective primers used in the primary PCR.

For 5' flanking border sequences, nested PCR was initiated using primers specific to the 5' end of the inserted T-DNA along with primers complementary to the adaptor sequence ligated onto the digested DNA. Similarly, cloning of the 3' flanking border sequence started with a primer specific for the 3' end of the inserted T-DNA and a primer complementary to the adaptor sequence. DNA sequences internal to the T-DNA Right Border and Left Border sequences within the T-DNA region were used as the starting points for "walking out" to the maize genomic sequence, because they represented unique sequence (not homologous to endogenous maize genomic sequences) from which to anchor the genome walking primers.

The products produced by the nested PCR were analyzed by agarose gel electrophoresis (data not shown). Fragments visible in libraries prepared from one or more of the event DAS-59122-7 DNA samples and absent in libraries prepared from the Hi-II and PH09B genomic DNA samples were identified for further characterization. The identified PCR amplified fragments were separated by preparatory gel electrophoresis, isolated using a QIAquick Gel Extraction Kit (Qiagen), and sent directly for sequencing or cloned into a pGEM-T Easy plasmid vector using the pGEM-T Easy Vector System I (Promega Corp., Madison, WI) prior to DNA sequencing. Sequencing reactions were carried out with primers used for the nested PCR amplification or with primers specific for use with the pGEM-T Easy vector. The sequence obtained was used to design additional gene specific primers to continue “walking out” into the unknown maize genomic sequence. Multiple rounds of genome walking were performed until at least 500 bp of border sequence from the ends of the T-DNA insert were obtained.

To ensure validity of the flanking border sequences, additional event-specific PCR amplifications on genomic DNA from event DAS-59122-7 were performed. The amplified fragments were sequenced in order to further extend the region of sequence overlap from the T-DNA insert region into the 5' and 3' bordering genomic DNA. Primers, shown in Table 2, were designed based on the sequence obtained from the genome walking experiments to amplify a fragment spanning the unique junction of the T-DNA with the corn genomic DNA. Primer set 03-O-506/02-O-476 (SEQ ID NO: 10/SEQ ID NO:9) spanned the 5' junction and amplified a 313 bp fragment (from bp 2427 to bp 2739, see Figure 1), and primer set 02-O-447/03-O-577 (SEQ ID NO: 8/SEQ ID NO:17) spanned the 3' junction and amplified a 754 bp fragment (from bp 9623 to bp 10376, see Figure 1).

Table 2. Primer Sequences

Primer Name	Sequence (5' – 3')	Target Sequence Location (bp to bp) ¹
02-O-215	(SEQ ID NO: 1) GTGGCTCCTTCAACGTTGCGGTTCTGTC	2743-2716
02-O-219	(SEQ ID NO: 2) CGTGCAAGCGCTCAATTCGCCCTATAGTG	9830-9858
02-O-227	(SEQ ID NO: 3) AATTGAGCGCTTGCACGTTT	9846-9827

02-O-370	(SEQ ID NO: 4) AACACAAGACCGGCCACACCCTC	4871-4894
02-O-371	(SEQ ID NO: 5) GAGGTGGTCTGGATGGTGTAGGTCA	5187-5163
02-O-372	(SEQ ID NO: 6) TACAACCTCAAGTGGTTCCTCTTCCCGA	7017-7044
02-O-373	(SEQ ID NO: 7) GAGGTCTGGATCTGCATGATGCGGA	7897-7873
02-O-447	(SEQ ID NO: 8) AACCCTTAGTATGTATTTGTATT	9623-9645
02-O-476	(SEQ ID NO: 9) CTCCTTCAACGTTGCGGTTCTGTCAG	2739-2714
03-O-506	(SEQ ID NO: 10) TTTTGCAAAGCGAACGATTCAGATG	2427-2451
03-O-514	(SEQ ID NO: 11) GCGGGACAAGCCGTTTTACGTTT	2687-2709
03-O-542	(SEQ ID NO: 12) GACGGGTGATTTATTTGATCTGCAC	10766-10742
03-O-543	(SEQ ID NO: 13) CATCTGAATCGTTCGCTTTGCAAAA	2451-2427
03-O-564	(SEQ ID NO: 14) CTACGTTCCAATGGAGCTCGACTGTC	2324-2299
03-O-569	(SEQ ID NO: 15) GGTCAAGTGGACACTTGGTCACTCA	10150-10174
03-O-570	(SEQ ID NO: 16) GAGTGAAGAGATAAGCAAGTCAAAG	10275-10299
03-O-577	(SEQ ID NO: 17) CATGTATACGTAAGTTTGGTGCTGG	10376-10352
03-O-784	(SEQ ID NO: 18) AATCCACAAGATTGGAGCAAACGAC	2189-2213
67609	(SEQ ID NO: 36) CGTATTACAATCGTACGCAATTCAG	9862-9886
69240	(SEQ ID NO: 37) GGATAAACAAACGGGACCATAGAAG	9941-9965

¹ Location in sequence of Event DAS-59122-7 (see Figure 1). Bases 1 - 2593 = 5' border, bases 2594 - 9936 = T-DNA insert, bases 9937 - 11922 = 3' border.

For verification of the DNA sequence that inserted into the maize genome, PCR was performed to amplify, clone, and sequence the inserted T-DNA from event DAS-59122-7. PCR primer sets, (SEQ ID NO: 11/SEQ ID NO:5); (SEQ ID NO: 4/SEQ ID NO:7); and (SEQ ID NO: 6/SEQ ID NO:3) shown in Table 3 were used to amplify three overlapping fragments labeled 22I-1 (SEQ ID NO: 25), 22I-2 (SEQ ID NO: 26), and 22I-3 (SEQ ID NO: 27) representing sequence from the 5' region of the T-DNA running through to the 3' region of the

T-DNA insert from bp 2687 to bp 9846 for event DAS-59122-7 (see Figure 1). PCR amplicon information is reported in Table 3 and primer sequences are listed in Table 2.

Table 3. PCR Primer and Amplicon Descriptions

PCR Amplicon	Size (bp)	Target Sequence	Forward Primer	Reverse Primer	Location of PCR Amplicon (bp to bp) ¹
22I-1 (SEQ ID NO:25)	2501	T-DNA insert	03-O-514 (SEQ ID NO:11)	02-O-371 (SEQ ID NO:5)	2687 – 5187
22I-2 (SEQ ID NO:26)	3027	T-DNA insert	02-O-370 (SEQ ID NO:4)	02-O-373 (SEQ ID NO:7)	4871 – 7897
22I-3 (SEQ ID NO:27)	2830	T-DNA insert	02-O-372 (SEQ ID NO:6)	02-O-227 (SEQ ID NO:3)	7017 - 9846
O784/O564 (SEQ ID NO:28)	136	5' genomic border	03-O-784 (SEQ ID NO:18)	03-O-564 (SEQ ID NO:14)	2189 – 2324
O784/O543 (SEQ ID NO:29)	263	5' genomic border	03-O-784 (SEQ ID NO:18)	03-O-543 (SEQ ID NO:13)	2189 - 2451
O569/O577 (SEQ ID NO:30)	227	3' genomic border	03-O-569 (SEQ ID NO:15)	03-O-577 (SEQ ID NO:17)	10150 - 10376
PCR Amplicon	Size (bp)	Target Sequence	Forward Primer	Reverse Primer	Location of PCR Amplicon (bp to bp) ¹
O570/O542 (SEQ ID NO:31)	492	3' genomic border	03-O-570 (SEQ ID NO:16)	03-O-542 (SEQ ID NO:12)	10275 – 10766
O784/O215 (SEQ ID NO:32)	555	5' junction	03-O-784 (SEQ ID NO:18)	02-O-215 (SEQ ID NO:1)	2189 – 2743
O219/O577 (SEQ ID NO:33)	547	3' junction	02-O-219 (SEQ ID NO:2)	03-O-577 (SEQ ID NO:17)	9830 – 10376
O506/O476 (SEQ ID NO:34)	313	5' junction	03-O-506 (SEQ ID NO:10)	02-O-476 (SEQ ID NO:9)	2427 - 2739
O447/O577 (SEQ ID NO:35)	754	3' junction	02-O-447 (SEQ ID NO:8)	03-O-577 (SEQ ID NO:17)	9623 - 10376
67609/69240 (SEQ ID NO:38)	104	3' junction	67609 (SEQ ID NO:36)	69240 (SEQ ID NO:37)	9862-9965

- ¹ Location in sequence of Event DAS-59122-7 (see Figure 1). Bases 1 - 2593 = 5' border, bases 2594 - 9936 = T-DNA insert, bases 9937 - 11922 = 3' border.

PCR GC2 Advantage™ Polymerase kit (BD Biosciences Clontech, Inc.) was used according to manufacturer's instructions to amplify the insert fragments (22I-1 (SEQ ID NO: 25), 22I-2 (SEQ ID NO: 26), and 22I-3 (SEQ ID NO: 27)). Briefly, a 50µL reaction contained 5' and 3' primers at a final concentration of 0.2µM and 40 ng of genomic DNA. PCR reactions were set up in duplicate using genomic DNA preparation from plants DAS-59122-7 T1S2 1 and DAS-59122-7 T1S2 2. PCR conditions were as follows: initial denaturation at 95°C for 1 min, followed by 35 cycles of 94°/95°C for 30 sec, 55°C for 30 sec, and 68°C for 5 min, with final extension at 68°C for 6 min. PCR amplification products were visualized under UV light, following electrophoresis through a 1% agarose gel in 1X TBE (89mM Tris-Borate, 2mM EDTA, pH 8.3) stained with ethidium bromide.

PCR fragments 22I-1 (SEQ ID NO: 25), 22I-2 (SEQ ID NO: 26), and 22I-3 (SEQ ID NO: 27) were purified by excising the fragments from 0.8% agarose gel in 1X TBE stained with ethidium bromide, and purifying the fragment from the agarose using a QIAquick Gel Extraction Kit (Qiagen). PCR fragments were cloned into a pGEM-T Easy plasmid vector using the pGEM-T Easy Vector System I (Promega Corp.). Cloned fragments were verified by miniprep of the plasmid DNA (QIAprep Spin Miniprep Kit, Qiagen) and restriction digestion with *Not* I. Plasmid clones and/or purified PCR insert fragments were then sent for sequencing of the complete insert. Sequencing reactions were carried with primers designed to be specific for known T-DNA sequences or with primers specific for use with the pGEM-T Easy vector. Sigma-Genosys, Inc. (The Woodlands, TX) synthesized all PCR primers, which were used at a final concentration of 0.2 – 0.4 µM in the PCR reactions.

PCR reactions with genomic DNA isolated from *B.t.* Cry34/35Ab1 events DAS-59122-7, DAS-45214-4, and DAS-45216-6, and unmodified control lines Hi-II and PH09B were used to confirm (1) the presence of maize genomic DNA in the sequenced border regions of event DAS-59122-7, and (2) event specific amplification across the junctions of the T-DNA insert and genomic DNA borders in event DAS-59122-7.

PCR primers designed to amplify the border sequence flanking the insert in event DAS-59122-7 were used to confirm the presence of those regions in unmodified control lines as well as in event DAS-59122-7. Two (2) sets of primers each, for the 5' and 3' borders (four

(4) sets total) were tested. Primer sets 03-O-784/03-O-564 (SEQ ID NO: 18/SEQ ID NO:14) and 03-O-784/03-O-543 (SEQ ID NO: 18/SEQ ID NO:13) were used to amplify 136 bp and 263 bp fragments, respectively, from border sequence 5' to the T-DNA insert in event DAS-59122-7 (Figures 2 and 3). Similarly, primer sets 03-O-569/03-O-577 (SEQ ID NO: 15/SEQ ID NO:17) and 03-O-570/03-O-542 (SEQ ID NO: 16/SEQ ID NO:12) were used to amplify 227 bp and 492 bp fragments, respectively, from the 3' genomic border (Figures 2 and 3).

Primers designed to amplify fragments across the junction of the border sequence and T-DNA insert were used to establish event-specific PCR fragments for event DAS-59122-7.

One primer set was selected for each of the two junctions. Primer set 03-O-784/02-O-215 (SEQ ID NO: 18/SEQ ID NO:1) was designed to amplify a 555 bp fragment across the 5' junction, and primer set 02-O-219/03-O-577 (SEQ ID NO: 2/SEQ ID NO:17) was designed for amplification of a 547 bp fragment at the 3' junction. A set of primers, IVR1(O197) (SEQ ID NO: 39) 5'- CCGCTGTATCACAAGGGCTGGTACC-3' and IVR2(O198) (SEQ ID NO: 40) 5'- GGAGCCCGTGTAGAGCATGACGATC-3', based on the endogenous maize invertase gene (Hurst *et al.*, (1999) *Molecular Breeding* 5 (6):579-586), was used to generate a 226 bp amplification product as an internal positive control for all maize genomic DNA samples.

All PCR primers were synthesized by Sigma-Genosys, Inc. and used at a final concentration of 0.2 – 0.4 μ M in the PCR reactions. PCR primer sequences are listed in the Table 2. For PCR amplifications, AdvantageTM-GC 2 PCR kit (BD Biosciences) was used according to manufacturer's instructions. Approximately 10-100 ng of genomic DNA template was used per 50 μ L PCR reaction. PCR conditions were as follows: initial template denaturation at 94°C for 5 min, followed by 35 cycles of 95°C for 1 minute, 60°C for 2 minutes, and 72°C for 3 min, with final extension at 72°C for 7 min. The PCR amplification products were visualized under UV light following electrophoresis through a 1% agarose gel with 1X TBE and ethidium bromide.

Sequence data obtained for the T-DNA insert and border regions of event DAS-59122-7 was reviewed and assembled using Seqman IITM software Version 4.0.5 (DNASTar, Inc., Madison, WI). The 5' and 3' border sequences flanking the insert present in event DAS-59122-7 were used for homology searching against the GenBank public databases in order to further characterize the site of insertion in the maize genome. Analysis to identify

open reading frames in the junction regions between the flanking borders and T-DNA insert in event DAS-59122-7 was conducted using Vector NTI 8.0 (InforMax™, Inc., Frederick, MD).

In total, 11922 bp of sequence from genomic DNA of event DAS-59122-7 was confirmed (see Figure 1). At the 5' end of the T-DNA insert, 2593 bp of flanking border sequence was identified, and 1986 bp of flanking border sequence was obtained on the 3' end from fragments derived from genome walking experiments. A total of 7160 bp of the T-DNA insert was cloned and sequenced using PCR primer sets designed to amplify three overlapping fragments labeled 22I-1 (2501 bp) (SEQ ID NO:25), 22I-2 (3027 bp) (SEQ ID NO:26), and 22I-3 (2830 bp) (SEQ ID NO:27) representing sequence from the 5' region of the T-DNA running through to the 3' region of the T-DNA insert for event DAS-59122-7 from bp 2687 to bp 9846 (see Figure 1). The remainder of the T-DNA insert region was sequenced from two PCR fragments, O506/O476 (SEQ ID NO: 10/SEQ ID NO:9) and O447/O577 (SEQ ID NO: 8/SEQ ID NO:17) that spanned the 5' and 3' junctions, respectively, of the T-DNA insert with corn genomic DNA. Primers used were designed based on the sequence obtained from the genome walking experiments to amplify a fragment spanning the unique junction of the T-DNA with the corn genomic DNA. Primer set 03-O-506/03-O-476 (SEQ ID NO: 10/SEQ ID NO:9) spanned the 5' junction and amplified a 313 bp fragment (from bp 2427 to bp 2739) and primer set 03-O-447/03-O-577 (SEQ ID NO: 8/SEQ ID NO:17) spanned the 3' junction and amplified a 754 bp fragment (from bp 9623 to bp 10376). Combined, a total of 7343 bp of the T-DNA insert in event DAS-59122-7 was cloned and sequenced (from bp 2594 to bp 9936, see Figure 1) and compared to the sequence of the transforming plasmid, PHP17662. Two nucleotide differences at bp 6526 and bp 6562 were observed in the non-translated wheat peroxidase promoter region of the T-DNA insert (see Figure 1). Neither of the observed base changes affected the open reading frame composition of the T-DNA insert. Both the 3' and 5' end regions of the T-DNA insert were found to be intact, except for deletion of the last 22 bp at the 5' end and 25 bp at the 3' end encompassing the Right and Left T-DNA Border regions, respectively. While T-DNA border sequences are known to play a critical role in T-DNA insertion into the genome, this result is not unexpected since insertions are often imperfect, particularly at the Left T-DNA Border (Tinland (1996) *Trends in Plant Science* 1(6):178-184).

BLAST (Basic Local Alignment Search Tool) analysis of the genomic border regions of event DAS-59122-7 showed limited homology with publicly available sequences (Release 138.0 GenBank, Oct 25, 2003). Analysis of the 5' border region found two areas with

significant homology to maize genomic and EST (Expressed Sequence Tag) sequences. The first area encompasses 179 bp (bp 477 to bp 655 of the border sequence) and displays similarity to several molecular markers, chromosomal sequences, and consensus sequences obtained by alignment of various ESTs. The second area occurs at bp 1080 to bp 1153 (74 bp) of the 5' border sequence, and shows similarity to a number of different maize ESTs and genomic sequences. The 3' border region also had two small non-contiguous regions of similarity to plant DNA sequences. The inner 3' region of 162 bp (bp 9954 to bp 10115) showed similarity to the 3' untranslated end of two genomic *Zea mays* alcohol dehydrogenase (*adh1*) genes as well as to several EST consensus sequences. A smaller region (57 bp) in the middle of the 3' border (bp 10593 to bp 10649) showed similarity to non-coding regions from multiple maize genomic sequences.

Overall, no homologous regions greater than 179 base pairs were identified in either of the genomic border sequences, nor was more than one homologous region from the same known sequence found. Individual accessions displaying similarity to the event DAS-59122-7 border sequences were examined to determine if the insertion in event DAS-59122-7 occurred in a characterized protein coding sequence. None of the regions of similarity occurred within any known protein coding sequences. Local alignment of the entire transformation plasmid sequence, PHP17662, with the event DAS-59122-7 border sequences showed no significant homologies, indicating that the border regions flanking the T-DNA insert did not contain fragments of the transforming plasmid. Therefore, identification and characterization of the genomic sequence flanking the insertion site in event DAS-59122-7 was limited due to the absence of significant regions of homology to known sequences.

The 5' and 3' junction regions between the maize genomic border sequence and the T-DNA insert in event DAS-59122-7 were analyzed for the presence of novel open reading frames. No open reading frames of significant size (> 100 amino acids) were identified in the 5' or 3' border junction regions, indicating that no novel open reading frames were generated as a result of the T-DNA insertion. Additionally, the homology searches did not indicate the presence of endogenous maize open reading frames in the border regions that might have been interrupted by the T-DNA insertion in *B.t.* Cry34/35Ab1 event DAS-59122-7.

Example 5. PCR Primers

DNA event specific primer pairs were used to produce an amplicon diagnostic for DAS-59122-7. These event primer pairs include, but are not limited to, SEQ ID NO: 18 and SEQ ID NO: 1; SEQ ID NO: 2 and SEQ ID NO: 17; SEQ ID NO: 10 and SEQ ID NO: 9; and
5 SEQ ID NO: 8 and SEQ ID NO: 17; and SEQ ID NO: 36 and SEQ ID NO: 37. In addition to these primer pairs, any primer pair derived from SEQ ID NO: 21 and SEQ ID NO: 22 that when used in a DNA amplification reaction produces a DNA amplicon diagnostic for DAS-59122-7 is an embodiment of the present invention. Any modification of these methods that use DNA primers or complements thereof to produce an amplicon DNA molecule
10 diagnostic for DAS-59122-7 is within the ordinary skill of the art. In addition, control primer pairs, which include IVR1(O197)/IVR2(O198) (SEQ ID NO: 39/SEQ ID NO: 40) for amplification of an endogenous corn gene are included as internal standards for the reaction conditions.

The analysis of plant tissue DNA extracts to test for the presence of the DAS-59122-7
15 event should include a positive tissue DNA extract control (a DNA sample known to contain the transgenic sequences). A successful amplification of the positive control demonstrates that the PCR was run under conditions that allow for the amplification of target sequences. A negative, or wild-type, DNA extract control in which the template DNA provided is either genomic DNA prepared from a non-transgenic plant, or is a non-DAS-59122-7 transgenic
20 plant, should also be included. Additionally a negative control that contains no template corn DNA extract will be a useful gauge of the reagents and conditions used in the PCR protocol.

Additional DNA primer molecules of sufficient length can be selected from SEQ ID NO: 21 and SEQ ID NO: 22 by those skilled in the art of DNA amplification methods, and conditions optimized for the production of an amplicon diagnostic for event DAS-59122-7.
25 The use of these DNA primer sequences with modifications to the methods shown in these Examples are within the scope of the invention. The amplicon wherein at least one DNA primer molecule of sufficient length derived from SEQ ID NO: 21 and SEQ ID NO: 22 that is diagnostic for event DAS-59122-7 is an embodiment of the invention. The amplicon wherein at least one DNA primer of sufficient length derived from any of the genetic elements of
30 PHI17662A that is diagnostic for event DAS-59122-7 is an embodiment of the invention. The assay for the DAS-59122-7 amplicon can be performed by using a Stratagene Robocycler, MJ

Engine, Perkin-Elmer 9700, or Eppendorf Mastercycler Gradient thermocycler, or by methods and apparatus known to those skilled in the art.

5 Having illustrated and described the principles of the present invention, it should be apparent to persons skilled in the art that the invention can be modified in arrangement and detail without departing from such principles. We claim all modifications that are within the spirit and scope of the appended claims.

All publications and published patent documents cited in this specification are incorporated herein by reference to the same extent as if each individual publication or patent application was specifically and individually indicated to be incorporated by reference.

10

WHAT IS CLAIMED IS:

1. An isolated DNA molecule comprising a junction sequence comprising a sequence selected from the group consisting of SEQ ID NO: 33, 35, and complements thereof.
2. An insect resistant corn plant, or parts thereof, wherein DNA having at least one nucleotide sequence selected from the group consisting of SEQ ID NO: 33, 35, and complements thereof forms part of the plant's genome.
3. A descent plant of the insect resistant corn plant of claim 2, wherein DNA having at least one nucleotide sequence selected from the group consisting of SEQ ID NO: 33, 35, and complements thereof, forms part of the descent plant's genome.
4. A seed of the plant of claim 2, wherein DNA having at least one nucleotide sequence selected from the group consisting of SEQ ID NO: 33, 35, and complements thereof, forms part of the seed's genome.
5. A seed of the plant of claim 3, wherein DNA having at least one nucleotide sequence selected from the group consisting of SEQ ID NO: 33, 35, and complements thereof, forms part of the seed's genome.
6. A method of producing an insect resistant corn plant, said method comprising breeding with the plant of claim 2, and selecting progeny by analyzing for at least one nucleotide sequence selected from the group consisting of SEQ ID NO: 33, 35, and complements thereof.
7. A method of producing an insect resistant corn plant, said method comprising breeding with the plant of claim 3, and selecting progeny by analyzing for at least one nucleotide sequence selected from the group consisting of SEQ ID NO: 33, 35, and complements thereof.

8. A method of detecting event DAS-59122-7 in corn tissue, said method comprising:

- (a) contacting a sample of said corn tissue with a polynucleotide probe that hybridizes under stringent hybridization conditions with one or more DNA sequences selected from the group consisting of SEQ ID NO: 33, 35, and complements thereof;
- (b) subjecting said sample and probe to stringent hybridization conditions;

and

- (c) analyzing for hybridization of the probe.

9. A DNA detection kit comprising a polynucleotide probe capable of uniquely identifying event DAS-59122-7, wherein said probe comprises a sequence of at least eleven contiguous nucleotides, and wherein said probe hybridizes under stringent hybridization conditions with one or more DNA sequences selected from the group consisting of SEQ ID NO: 33, 35, and complements thereof.

ABSTRACT OF THE DISCLOSURE

The invention provides DNA compositions that relate to transgenic insect resistant maize plants. Also provided are assays for detecting the presence of the maize DAS-59122-7
5 event based on the DNA sequence of the recombinant construct inserted into the maize genome and the DNA sequences flanking the insertion site. Kits and conditions useful in conducting the assays are provided.

FIG. 1 (Sheet 1 of 5)

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1      CTGAGCGCAC AACAGCGAGT CGCATGGCAC CGGACGACAT GAGCGAGATT
51     TAGATCGGAG GGTGCGGACA TGGGGCAACC TCGCGAGCTA ACGCAGGGAT
101    CCACACGACC ACCAACGAAG CCAAGCCCGG GCACGTCCCC AGGCAGGTTG
151    GGCCCTGGTT CCACCAGCGG ATGCATGCAG TGAAGCGGGG ACGGAGAGAC
201    AAGCCGAGGG CGCGGGTGGG AATGGCGTCC GGGAGGACGA GTGGAGGAGA
251    AGAATCTAGA GGCATCGAGA TTCGAGAAGC CGACGGAGAC AAGATTCGTG
301    TGGGGGGAGA CAAACCGCGG GGCIGAGCGC CGTTGATATG GGATCAGACG
351    GTGTGGATAA AAAAAGTGAC GTTGATAGAA CGTCTGGCCA GTGAAAAAAC
401    AAAACAATC CAACAAAATA CTTTAAAAGC TCTTATACCC TAAATGTAGG
451    GGATCAAACA CGTCTCTACA CTATTTAGCA GCGTCCTCTA AATGATCCTC
501    TAAATTTAGA GAACGCTACT AGATTCTCTA TATATAGTTT CTCTAAACGA
551    TCTTTTATCC ATTTAAATAC TTTAAATAAC CGGTTTAAAC AACTAAAAAT
601    ATATACAATA CATTTGAGAG TATGACAAAT ACGTATGTAT AAAAAATAAA
651    AATAAAATAA TGTATTAGTC TACTTTGAAT CTTCTTTTCT TCATAATATA
701    ATGATGTATA GCTCTCATGT GCGTTGAGAA AAAAGTTAGA GCTAGACGTT
751    TAATGTGTAG TGACAGTCTT CGACGAAATC TCCCTAATGA GATGAATTAC
801    TGGAGGTTCC ATCAGAAAGT CCCCTGAAAA GAGGCATTTA TTTAGTTTAG
851    TCAGCAATTT CTGGGAACAC AAATATTCTT TTGTTATCAC CACTATTAA
901    AATCTATGGT TATAACTTAT AATAACATGA AAAAATAATT TAGCATCCCA
951    TATATATAAA AACTGAAGGA AGCCATATAT ACTAACATAA GTTAGGAGAA
1001   ACTAAGAAGG TTGTGCAAAG CTTGCACTGC TCCAAAATAC TGCAACAAC
1051   CACTCTCCTC TACCAACCAA AGAACTCAT GTACTCCCTC CGTTCTTTTT
1101   TATTTGTGCG ATTTTAGTTT AAAAATGAAC TAGCAGTCGA CAAATATTCTG
1151   AGAACAGATA TAGTATATAC TAACATAACT TAGGAGATAC TAAGAAAGTT
1201   GCGCAGAGCT TTCACTGTTT CAAATTACTG CAAAGCCTCT CCCCTCTGCC
1251   AGTACATCTA CGAGATGTTT CAGTTAAACA AAGATTGAGA CAAGTGATGA
1301   GCCACTTCTT GTCATAGATT GTGTGGTCAA CCAACCCATT GATGCCACGG
1351   TTTTGTGCA TCCATGCTTT TGTATTAAAA CATCAGTTAT GTTTACCATG
1401   TCCGATATGC TCTACATAAT GACAATCAAC TTGGTGTTC TATATTTTAC
1451   AATGTTAGGA ATTTCAATAG CTACGAACAC TTCAATAGAA GTGCCTTTGT
1501   GGGATCACCT TAATGTGTTG TTGATGTAAG GAGAAGAATC TTAATTTACT
1551   CTTGCTAAAT TTGAACATA CAAAACCACT GCACTGAGGA TTGTCCTAAT
1601   AAATTACTGC TCATACACGT TAGCATCTGT TCAGATACTG AGCTAATCCC
1651   TAGGATTAAA GGATTGTAA AAGATATGCC CAATCATTCA TTTTAGTTAT
1701   TTATTTCTTA GTTATCCACT TGAAGATTTA CATACTTTG AAATAAATTT
1751   CTTAGAGGTA AAGTGAATAT CAGTTATTTA AATACATTTT AGTTATTTAT
1801   TTTCTTCTTT TTCTTAATTT TTCTTGTAT TTGAAGTCTG AAAAGATAAC
1851   TTTGCCCTTA TACATATTTT ATCTTCTACG TACGCATCTG AACACGTCT
1901   CTTTGTCCCC TGATCGTGCA GCAATTAGTG CTATGAATCG CGTTAAGCG
1951   CTGCAAAATC ATGCGTGGGG CTTCGTCCTC GAGTCGTCTT GCTGCTCGAT
2001   GTCACCTCGA GTCCCGCACC GACCTCAGTG CTTGTTCTTG TTGGAGCCAC
2051   CTCCTCGGA CGATCGCCAA AGACGGATAA GGCCGAAGCC GTCACCTCAG
2101   ACCGCGCTCA TCGCGCTAG CAGACTCCTA CATAGCAGGG CCAGGGTATG
2151   TGGACCTTTG CAAGTTTAGG ATTGGAACCA GCGACCAGAA TCCACAAGAT
2201   TGGAGCAAAC GACCAAAAAT TCACAAGGAT TGGCGGCTGA CATTGCCAGC
2251   GCGGGATCGC ATGCGGCGGC GCGGCGCGG GCGAGCACGG GAGCAGGCGA
2301   CAGTCGAGCT CCATTGGAAC GTAGAAATAC TTAAGGGCAA GGTCTCCAAA
2351   TACTTGAAAA AATAGGAAAA AGAAGAAAAT ACATGAAATG ATATTGAAAT
2401   CAATTGGAAG ATGTTATGAA TCTTGTTTTT GCAAAGCGAA CGATTGAGAT

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FIG. 1 (Sheet 2 of 5)

2451	GGCAAAACTA	TGAATCTTTT	TGTTTGAAGT	CCCAAATATA	AAATTTTCTC
2501	GTACTCACCA	ACATTGGTGC	GCACCTGTGA	TTGGCTCATA	AAAATTCCTG
2551	GAGGGACGGA	AGAAAGAGTG	AAGGGATAAG	CAAGTAAAAG	CGCTCAAAACA
2601	CTGATAGTTT	AAACTGAAGG	CGGGAAACGA	CAATCTGATC	ATGAGCGGAG
2651	AATTAAGGGA	GTCACGTTAT	GACCCCCGCC	GATGACGCGG	GACAAGCCGT
2701	TTTACGTTTG	GAACTGACAG	AACCGCAACG	TTGAAGGAGC	CACTCAGCAA
2751	GCTTACTAGT	AGCGCTGTTT	AAACGCTCTT	CAACTGGAAG	AGCGGTTACC
2801	CGGACCGAAG	CTTGCATGCC	TGCAGTGCAG	CGTGACCCGG	TCGTGCCCCCT
2851	CTCTAGAGAT	AATGAGCATT	GCACTGTCTAA	GTTATAAAAA	ATTACCACAT
2901	ATTTTTTTTG	TCACACTTGT	TTGAAGTGCA	GTTTATCTAT	CTTTATACAT
2951	ATATTTTAAAC	TTTACTCTAC	GAATAATATA	ATCTATAGTA	CTACAATAAT
3001	ATCAGTGTTT	TAGAGAATCA	TATAAATGAA	CAGTTAGACA	TGGTCTAAAG
3051	GACAATTGAG	TATTTTGACA	ACAGGACTCT	ACAGTTTAT	CTTTTATGTG
3101	TGCATGTGTT	CTCCTTTTTT	TTTGCAAATA	GCTTCACCTA	TATAATACTT
3151	CATCCATTTT	ATTAGTACAT	CCATTTAGGG	TTTAGGGTTA	ATGGTTTTTA
3201	TAGACTAATT	TTTTTAGTAC	ATCTATTTTA	TTCTATTTTA	GCCTCTAAAT
3251	TAAGAAAACT	AAAACCTCTAT	TTTAGTTTTT	TTATTTAATA	ATTAGATAT
3301	AAAATAGAAT	AAAATAAAGT	GACTAAAAAT	TAAACAAATA	CCCTTTAAGA
3351	AATTAAAAAA	ACTAAGGAAA	CATTTTTCCT	GTTTCGAGTA	GATAATGCCA
3401	GCCTGTAA	CGCCGTCGAC	GAGTCTAACG	GACACCAACC	AGCGAACCAG
3451	CAGCGTCGCG	TCGGGCCAAG	CGAAGCAGAC	GGCAGGCGAT	CTCTGTGCGT
3501	GCCTCTGGAC	CCCTCTCGAG	AGTTCCGCTC	CACCGTTGGA	CTTGCTCCGC
3551	TGTCGGCATC	CAGAAATTGC	GTGGCGGAGC	GGCAGACGTG	AGCCGGGCACG
3601	GCAGGCGGCC	TCCTCCTCCT	CTCACGGCAC	CGGCAGCTAC	GGGGGATTCC
3651	TTTCCCACCG	CTCCTTCGCT	TTCCCTTCCT	CGCCCGCCGT	AATAAATAGA
3701	CACCCCTCC	ACACCCTCTT	TCCCCAACCT	CGTGTGTTC	GGAGCGCACA
3751	CACACACAAC	CAGATCTCCC	CCAAATCCAC	CCGTCGGCAC	CTCCGCTTCA
3801	AGGTACGCCG	CTCGTCCTCC	CCCCCCCCC	CTCTCTACCT	TCTCTAGATC
3851	GGCGTTCGG	TCCATGGTTA	GGGCCCGGTA	GTTCTACTTC	TGTTTATGTT
3901	TGTGTTAGAT	CCGTGTTTGT	GTTAGATCCG	TGCTGCTAGC	GTTTCGTACAC
3951	GGATGCGACC	TGTACGTCAG	ACACGTTCTG	ATTGCTAACT	TGCCAGTGTT
4001	TCTCTTTGGG	GAATCCTGGG	ATGGCTCTAG	CCGTTCCGCA	GACGGGATCG
4051	ATTTTCATGAT	TTTTTTTGT	TCGTTGCATA	GGGTTTGGTT	TGCCCTTTTC
4101	CTTTATTTCA	ATATATGCCG	TGCACTTGT	TGTCGGGTCA	TCTTTTCATG
4151	CTTTTTTTTG	TCTTGGTTGT	GATGATGTGG	TCTGGTTGGG	CGGTCGTTCT
4201	AGATCGGAGT	AGAAATCTGT	TTCAAACCTAC	CTGGTGGATT	TATTAATTTT
4251	GGATCTGTAT	GTGTGTGCCA	TACATATTCA	TAGTTACGAA	TTGAAGATGA
4301	TGGATGGAAA	TATCGATCTA	GGATAGGTAT	ACATGTTGAT	GCGGGTTTTA
4351	CTGATGCATA	TACAGAGATG	CTTTTTGTTC	GCTTGGTTGT	GATGATGTGG
4401	TGTGGTTGGG	CGGTCGTTCA	TTGCTTCTAG	ATCGGAGTAG	AATACTGTTT
4451	CAAACCTACCT	GGTGTATTTA	TTAATTTTGG	AACTGTATGT	GTGTGTCATA
4501	CATCTTCATA	GTTACGAGTT	TAAGATGGAT	GGAAATATCG	ATGTAGGATA
4551	GGTATACATG	TTGATGTGGG	TTTTACTGAT	GCATATACAT	GATGGCATAT
4601	GCAGCATCTA	TTCATATGCT	CTAACCTTGA	GTACCTATCT	ATTATAATAA
4651	ACAAGTATGT	TTTATAATTA	TTTTGATCTT	GATATACTTG	GATGATGGCA
4701	TATGCAGCAG	CTATATGTGG	ATTTTTTTAG	CCCTGCCTTC	ATACGCTATT
4751	TATTTGCTTG	GTAAGTGTTC	TTTTGTGCGAT	GCTCACCCCTG	TTGTTTGGTG
4801	TTACTTCTGC	AGGTCGACTC	TAGAGGATCC	ACACGACACC	ATGTCGCCCC
4851	GCGAGGTGCA	CATCGACGTG	AACAACAAGA	CCGGCCACAC	CCTCCAGCTG

FIG. 1 (Sheet 3 of 5)

4901	GAGGACAAGA	CCAAGCTCGA	CGGCGGCAGG	TGGCGCACCT	CCCCGACCAA
4951	CGTGGCCAAC	GACCAGATCA	AGACCTTCGT	GGCCGAATCC	AACGGCTTCA
5001	TGACCGGCAC	CGAGGGCACC	ATCTACTACT	CAATTAATGG	CGAGGCCGAG
5051	ATCAGCCTCT	ACTTCGACAA	CCCGTTTCGCC	GGCTCCAACA	AATACGACGG
5101	CCACTCCAAC	AAGTCCCAGT	ACGAGATCAT	CACCCAGGGC	GGCTCCGGCA
5151	ACCACTCCCA	CGTGACCTAC	ACCATCCAGA	CCACCTCCTC	CCGCTACGGC
5201	CACAAGTCCT	GAGTCATGAG	TCATGAGTCA	GTTAACCTAG	ACTTGTCCAT
5251	CTTCTGGATT	GGCCAACTTA	ATTAATGTAT	GAAATAAAAG	GATGCACACA
5301	TAGTGACATG	CTAATCACTA	TAATGTGGGC	ATCAAAGTTG	TGTGTTATGT
5351	GTAATTACTA	GTTATCTGAA	TAAAAGAGAA	AGAGATCATC	CATATTTCTT
5401	ATCCTAAATG	AATGTCACGT	GTCTTTATAA	TTCTTTGATG	AACCAGATGC
5451	ATTTTCATTAA	CCAAATCCAT	ATACATATAA	ATATTAAATCA	TATATAATTA
5501	ATATCAATTG	GGTTAGCAAA	ACAAATCTAG	TCTAGGTGTG	TTTTCGGAAT
5551	GCGGCCGCGG	ACCGAATTGG	GGATCTGCAT	GAAAGAAACT	GTCCGACTGC
5601	TGAACCGCAC	CTTGTCACCT	TCATCGAACA	CGACCTGTGC	CCAAGATGAC
5651	GGTGCTGCGG	TCTAAGTGAG	GCTGAATTGC	CTTGGACAGA	AGCGGACTCC
5701	CTACAATTAG	TTAGGCCAAA	CGGTGCATCC	ATGTGTAGCT	CCGGGCTCGG
5751	GCTGTATCGC	CATCTGCAAT	AGCATCCATG	GAGCTCGTTC	CATGTAGTTG
5801	GAGATGAACC	AATGATCGGG	CGTGTGGACG	TATGTTCCCTG	TGTACTCCGA
5851	TAGTAGAGTA	CGTGTTAGCT	CTTTCATGGT	GCAAGTGAAA	TTTGTGTTGG
5901	TTTAATTACC	CCTACGTTAG	TTGCGGGACA	GGAGACACAT	CATGAATTTA
5951	AAGGCGATGA	TGTCCTCTCC	TGTAATGTTA	TTCTTTTGAT	GTGATGAATC
6001	AAAATGTCAT	ATAAAACATT	TGTTGCTCTT	TAGTTAGGCC	TGATCGTAGA
6051	ACGAAATGCT	CGTGTAGCGG	GGCTACGAGC	CTATGACGCA	ATAACACTGG
6101	TTTGCCGGCC	CGGAGTCGCT	TGACAAAAAA	AAGCATGTTA	AGTTTATTTA
6151	CAATTCAAAA	CCTAACATAT	TATATTCCCT	CAAAGCAGGT	TCACGATCAC
6201	ACCTGTACCT	AAAAAAAACA	TGAAGAATAT	ATTACTCCAT	TATTATGAGA
6251	TGAACCACTT	GGCAAGAGTG	GTAAGCTATA	TAAAAAATG	AACATTATTA
6301	CGAGATGTTA	TATGCCATTA	TATTGATTCC	AAGATATATG	TTTCTTTCTC
6351	CCACGGGCAC	CTAACGGATA	CATGATAAGG	CCAAGGCAGA	TCACGGGAAA
6401	TTATTGCAAT	ACATGTTACG	CCCTATTGCC	GGAAAAAAA	TGCAGGGCAG
6451	GTGTTGGCCG	TAGCGATTTA	AGCACTTAAG	CTGGAGGTTG	CCACACTTGG
6501	ATGCAAGCGT	CTGACCCTTC	TAAAAATATCG	GCGGCTTTGT	CCGTATCCGT
6551	ATCCCTATC	CGACATCTAG	CTGGCCACAC	GACGGGGCTG	GGCAGATCGT
6601	GGATGCCGGG	TCGACGTCGA	TCGTACGCCA	TCATAGACCA	ATCGACCATC
6651	TGTTATGGAT	GCTTGCTAGC	TAGACTAGTC	AGACATAAAA	TTTGGAATACT
6701	TTCTCCCAAC	TGGGAGACGG	GGACTGATGT	GCAGCTGCAC	GTGAGCTAAA
6751	TTTTTCCCTA	TAAATATGCA	TGAAATACTG	CATTATCTTG	CCACAGCCAC
6801	TGCCACAGCC	AGATAACAAG	TGCAGCTGGT	AGCACGCAAC	GCATAGCTCT
6851	GGACTTGTAG	CTAGGTAGCC	AACCGGATCC	ACACGACACC	ATGCTCGACA
6901	CCAACAAGGT	GTACGAGATC	AGCAACCACG	CCAACGGCCT	CTACGCCGCC
6951	ACCTACCTCT	CCCTCGACGA	CTCCGGCGTG	TCCCTCATGA	ACAAGAACGA
7001	GCACGACATC	GACGACTACA	ACCTCAAGTG	GTTCTCTTTC	CCGATCGACG
7051	ACGACCAGTA	CATCATCACC	TCCTACGCCG	CCAACAACCTG	CAAGGTGTGG
7101	AACGTGAACA	ACGACAAGAT	TAATGTGTCA	ACCTACTCCT	CCACCAACTC
7151	CATCCAGAAG	TGGCAGATCA	AGGCCAACGG	CTCCTCCTAC	GTGATCCAGT
7201	CCGACAACGG	CAAGGTGCTC	ACCGCCGGCA	CCGGCCAGGC	CCTCGGCCTC
7251	ATCCGCCTCA	CCGACGAGTC	CTCCAACAAC	CCGAACCAGC	AATGGAACCT
7301	GACGTCCGTG	CAGACCATCC	AGCTCCCGCA	GAAGCCGATC	ATCGACACCA

FIG. 1 (Sheet 4 of 5)

7351	AGCTCAAGGA	CTACCCGAAG	TACTCCCCGA	CCGGCAACAT	CGACAACGGC
7401	ACCTCCCCGC	AGCTCATGGG	CTGGACCCTC	GTGCCGTGCA	TCATGGTGAA
7451	CGACCCGAAC	ATCGACAAGA	ACACCCAGAT	CAAGACCACC	CCGTACTACA
7501	TCCTCAAGAA	GTACCAGTAC	TGGCAGAGGG	CCGTGGGCTC	CAACGTCGCG
7551	CTCCGCCCGC	ACGAGAAGAA	GTCTTACACC	TACGAGTGGG	GCACCGAGAT
7601	CGACCAGAAG	ACCACCATCA	TCAACACCCT	CGGCTTCCAG	ATCAACATCG
7651	ACAGCGGCAT	GAAGTTCGAC	ATCCCGGAGG	TGGGCGGCGG	TACCGACGAG
7701	ATCAAGACCC	AGCTCAACGA	GGAGCTCAAG	ATCGAGTATT	CACATGAGAC
7751	GAAGATCATG	GAGAAGTACC	AGGAGCAGTC	CGAGATCGAC	AACCCGACCG
7801	ACCAGTCCAT	GAACTCCATC	GGCTTCTCTA	CCATCACCTC	CCTGGAGCTC
7851	TACCGCTACA	ACGGCTCCGA	GATCCGCATC	ATGCAGATCC	AGACCTCCGA
7901	CAACGACACC	TACAACGTGA	CCTCTTACCC	GAACCACCAG	CAGGCCCTGC
7951	TGCTGCTGAC	CAACCACTCC	TACGAGGAGG	TGGAGGAGAT	CACCAACATC
8001	CCGAAGTCCA	CCCTCAAGAA	GCTCAAGAAG	TACTACTTCT	GAGTCATGAG
8051	TCATGAGTCA	GTTAACCTAG	ACTGTGCCAT	CTTCTGGATT	GGCCAACCTA
8101	ATTAATGTAT	GAAATAAAAG	GATGCACACA	TAGTGACATG	CTAATCACTA
8151	TAATGTGGGC	ATCAAAGTTG	TGTGTTATGT	GTAATTACTA	GTTATCTGAA
8201	TAAAAGAGAA	AGAGATCATC	CATATTTCTT	ATCCTAAATG	AATGTCACGT
8251	GTCTTTATAA	TTCTTTGATG	AACCAGATGC	ATTTTCATTAA	CCAAATCCAT
8301	ATACATATAA	ATATTAATCA	TATATAATTA	ATATCAATTG	GGTTAGCAAA
8351	ACAAATCTAG	TCTAGGTGTG	TTTGCGAAT	TCCCATGGAG	TCAAAGATTC
8401	AAATAGAGGA	CCTAACAGAA	CTCGCCGTAA	AGACTGGCGA	ACAGTTCATA
8451	CAGAGTCTCT	TACGACTCAA	TGACAAGAAG	AAAATCTTCG	TCAACATGGT
8501	GGAGCACGAC	ACGCTTGTCT	ACTCCA AAAA	TATCAAAGAT	ACAGTCTCAG
8551	AAGACCAAAG	GGCAATTGAG	ACTTTTCAAC	AAAGGGTAAT	ATCCGGAAAC
8601	CTCCTCGGAT	TCCATTGCCC	AGCTATCTGT	CACCTTTATTG	TGAAGATAGT
8651	GGAAAAGGAA	GGTGGCTCCT	ACAAATGCCA	TCATTGCGAT	AAAGGAAAGG
8701	CCATCGTTGA	AGATGCCTCT	GCCGACAGTG	GTCCCAAAGA	TGGACCCCCA
8751	CCCACGAGGA	GCATCGTGGA	AAAAGAAGAC	GTTCCAACCA	CGTCTTCAAA
8801	GCAAGTGGAT	TGATGTGATA	TCTCCACTGA	CGTAAGGGAT	GACGCACAAT
8851	CCCACTATCC	TTCGCAAGAC	CCTTCCTCTA	TATAAGGAAG	TTCATTTTCAT
8901	TTGGAGAGGA	CAGGGTACCC	GGGGATCCAC	CATGTCTCCG	GAGAGGAGAC
8951	CAGTTGAGAT	TAGGCCAGCT	ACAGCAGCTG	ATATGGCCGC	GGTTTGTGAT
9001	ATCGTTAACC	ATTACATTGA	GACGTCTACA	GTGAACTTTA	GGACAGAGCC
9051	ACAAACACCA	CAAGAGTGGA	TTGATGATCT	AGAGAGGTTG	CAAGATAGAT
9101	ACCCTTGGTT	GGTTGCTGAG	GTTGAGGGTG	TTGTGGCTGG	TATTGCTTAC
9151	GCTGGGCCCT	GGAAGGCTAG	GAACGCTTAC	GATTGGACAG	TTGAGAGTAC
9201	TGTTTACGTG	TCACATAGGC	ATCAAAGGTT	GGGCCTAGGA	TCCACATTGT
9251	ACACACATTT	GCTTAAGTCT	ATGGAGGCGC	AAGGTTTAA	GTCTGTGGTT
9301	GCTGTTATAG	GCCTTCCAAA	CGATCCATCT	GTTAGGTTGC	ATGAGGCTTT
9351	GGGATACACA	GCCCGGGGTA	CATTGCGCGC	AGCTGGATAC	AAGCATGGTG
9401	GATGGCATGA	TGTTGGTTTT	TGGCAAAGGG	ATTTTGAGTT	GCCAGCTCCT
9451	CCAAGGCCAG	TTAGGCCAGT	TACCCAGATC	TGAGTCGACC	TGCAGGCATG
9501	CCCGCTGAAA	TCACCACTCT	CTCTCTACAA	ATCTATCTCT	CTCTATAATA
9551	ATGTGTGAGT	AGTTCCCAGA	TAAGGGAATT	AGGGTTCTTA	TAGGGTTTCG
9601	CTCATGTGTT	GAGCATATAA	GAAACCCTTA	GTATGTATTT	GTATTTGTAA
9651	AATACTTCTA	TCAATAAAAT	TTCTAATTCC	TAAAACCAAA	ATCCAGGGCG
9701	AGCTCGGTAC	CCGGGGATCC	TCTAGAGTCG	ACCTGCAGGC	ATGCCCGCGG
9751	ATATCGATGG	GCCCCGGCCC	AAGCTTCGGT	CCGGGCCATC	GTGGCCTCTT

FIG. 1 (Sheet 5 of 5)

9801 GCTCTTCAGG ATGAAGAGCT ATGTTTAAAC GTGCAAGCGC TCAATTCGGC
 9851 CTATAGTGAG TCGTATTACA ATCGTACGCA ATTCAGTACA TTAAAAACGT
 9901 CCGCAATGTG TTATTAAGTT GTCTAAGCGT CAATTTTTC CTTCATGGT
 9951 CCCGTTTGT TATCCTCTAA ATTATATAAT CCAGCTTAAA TAAGTTAAGA
 10001 GACAAACAAA CAACACAGAT TATTAAATAG ATTATGTAAT CTAGATACCT
 10051 AGATTATGTA ATCCATAAGT AGAATATCAG GTGCTTATAT AATCTATGAG
 10101 CTCGATTATA TAATCTTAAA AGAAAACAAA CAGAGCCCCT ATAAAAAGGG
 10151 GTCAAGTGGA CACTTGGTCA CTCATTTAAT CCCTCCCTCT CCTCTTTTAT
 10201 CCCTCTTTT GGTGTATTCA CCAATAGTGG TGTGCACCTG TGATTGGCTC
 10251 GTAAAAATTC TTGGACGGAT GGAAGAGTGA AGAGATAAGC AAGTCAAAGA
 10301 AAAGTAACAA CGAAGCTTCA TCAGCTACAA ATTTTGGCCC AACTGGTTGC
 10351 ACCAGCACCA AACTTACGTA TACATGATTA TCTCTGTTT CCTCATTTCT
 10401 AAGAAAAAAA CGGGTTTCAA AACCCACTGC TTTCAGGAGT AAAAAAGAT
 10451 AATAATCTGA AACATTGCTT CCACCTTGGC CCTTATTGG TTACGTTGCA
 10501 ATTCACCCCA ATCCACATGT GGATTGAGAT GGATTGCAGT GTAGCTAGAC
 10551 AAACCTTAG GCCCTGTTT CATAGGAATA CACCAGGAAT TATTCAGCT
 10601 AATCAAAATT TATATAAATG AGAGAAACAA TTCGGATAGG AATGTGTCCA
 10651 GGACTTCATT CTGCAGTAAC CGAACGGCCC CTTAATCCAC CCCAATACAC
 10701 GTGGATTGGA GTGGATTGAG GTACAGCCAA ACAAGGCCA AGTGCAGATC
 10751 AAATAAATCA CCCGTCATAT TCTTCTACCT ACAAAAACAG CAATAAACAC
 10801 CTGAATGAAG TTCTAATTTG CACAGTGTAG GTAGGATGAA AATAGTTACC
 10851 TCCTCATGGT CAGTAACTCT TGGCACACAA CTTACATGT AATCGATGTA
 10901 CCACCTGGCT CTTGCCTGAA ACCCAATACA TCTTTAGCAT AAGAATAATA
 10951 TTATGATGGC AAGGCATGAT CACCAGCACT CTTTATTGT TTAGTAAGTC
 11001 TATCACTCCC CAAAACAATT CAAATGAACA GAGATGCATT GCCCCCAATG
 11051 AATTCTATTT CAATTAGCCG GAAAATTCTA CTTATCAGA AGCATCCAAA
 11101 TTGCCAGCAT CCCTACTAGA CTGACCATGA CCAGGCTGCC GCAGATGCCT
 11151 CTTTTCTGT CCTCTCTCT TGCCTTGAG TTTCTCTCA AGATCCCTCA
 11201 CCCCACGTCT CTTATACATC TTAAAGCTAA CATGTCTCT CTCGCCATC
 11251 TTCCTAACCT TCTCAGTAAT CTCAGCAGCA ATCTGACGGT TGTACAATT
 11301 CTTAGCCCC TTCATCAACT TGCAAATGT GTCAGGCTGT GGCATCAGTC
 11351 CTGCCTCTAG CATGTCTAAG CAATACAGGC AGGCCCTCTT GACATGTTT
 11401 TTCGCAACA GTGCATGAAT CCAGATAGTC CATGCACTCA CATTGAGCTC
 11451 ACAGCCTTTG CTCACAATAC ATTTCCAAAC ATCCTTTGCA AGCTCAAGTT
 11501 TCTCATCTCT GACCAACGCA TTGAGGAGGT CTTTACGAC CCCATATTGC
 11551 GGTACCACAA AGAGCCCCCT CCCAACCATG TCTTTAAAAT AACTACATGC
 11601 CTCATCAGC AAACCCTGCC CAACAAGGCC ACTCACCACG ATAGCAAATG
 11651 TATCGACCAC AGGACTGAGC CCAGCACTT CCATCTCATT CCACAATGTC
 11701 ATGGCTTGCT TGGTCTCCCC AAGCCTGCAG GCCAACCGAA TCACCACATT
 11751 GTATATCTTG AGATCTGGTG GACACCGGCA CTCCGCAATC CTCTCCATCA
 11801 GCTCCAAGCA CTCTCAAGC TGCTCCTTCT TCTCGTGTGC TACAAAGAAA
 11851 CCATGGTACA CGGCAGCGTC CACCCGAGG CCATCCCTCG ACATAGCATC
 11901 CAAGAACTCG TACCCCTGGG AT

Figure 2/3

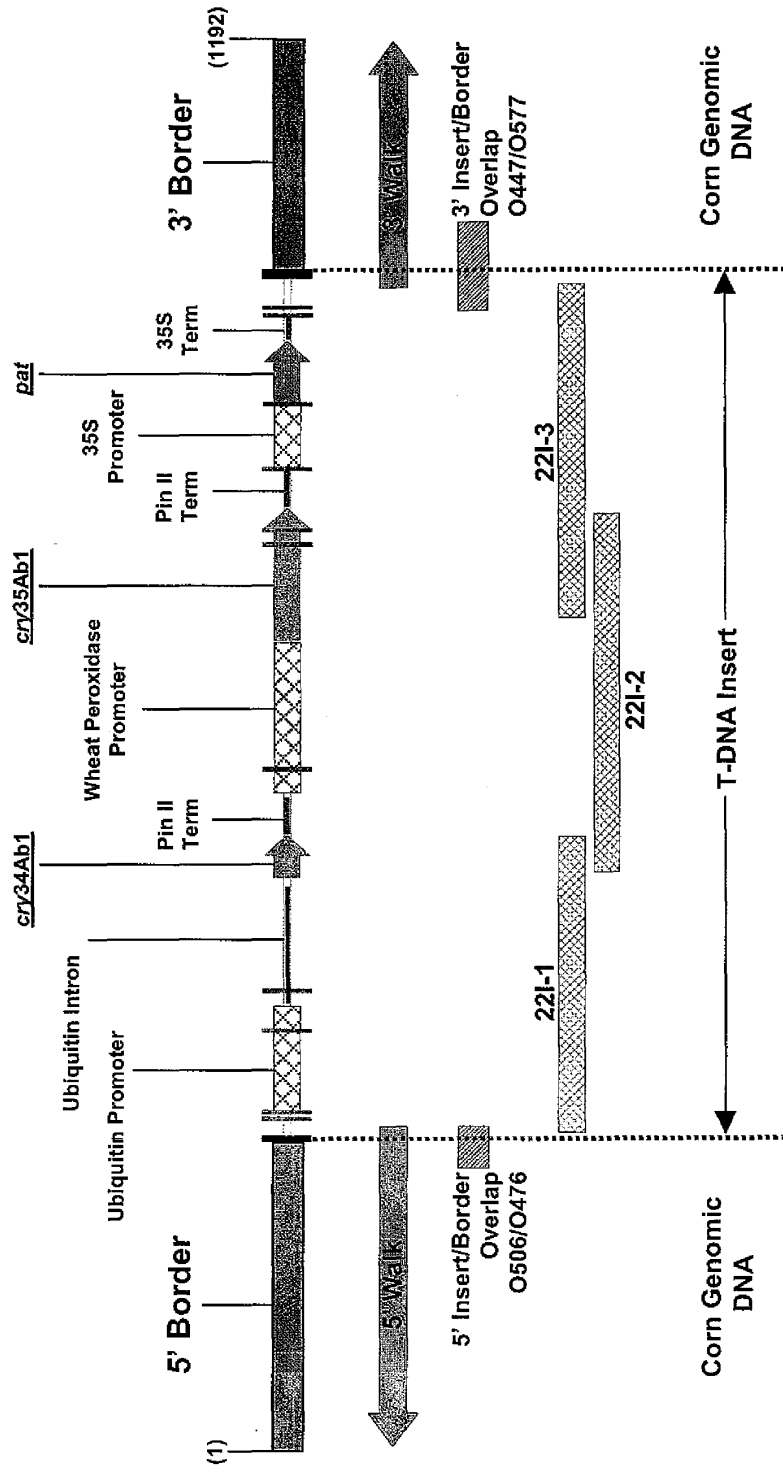


Figure 3/3





COPY

Attorney Docket No. 1895

DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION

As a below named inventor, I hereby declare that:

My residence, post office address, and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if multiple names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

Corn Event DAS-59122-7 and Methods for Detection Thereof

the specification of which (check one)

- ☐ is attached hereto
- ☒ was filed on 09/28/2005 as Application Serial No. 11/237,222 or PCT International Application No. _____ and was amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is known by me to be material to patentability as defined in Title 37, Code of Federal Regulations §1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

I hereby claim foreign priority benefits under Title 35, United States Code, §119(a)-(d) or (f), or §365(b), of any foreign application(s) for patent, inventor's or plant breeder's rights certificate(s), or under Title 35, United States Code, §365(a), of any PCT international application which designated at least one country other than the United States of America, listed below; and I have also identified below any related foreign application for patent, inventor's or plant breeder's rights certificate(s), or any related PCT International application, having a filing date before that of the application on which priority is claimed.

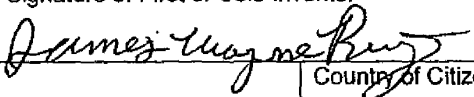
NUMBER	COUNTRY	MM/DD/YYYY FILED	PRIORITY CLAIMED	
			☐ Yes	☐ No
			☐ Yes	☐ No
			☐ Yes	☐ No

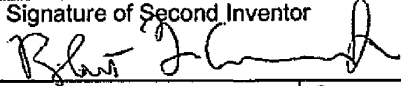
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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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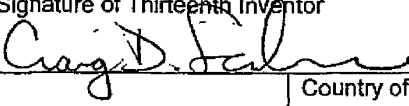
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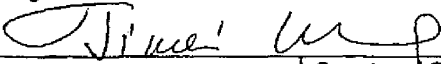
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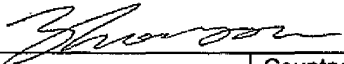
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Application Data Sheet

Application Information

Application Type::	Regular
Subject Matter::	Utility/Divisional
Suggested classification::	None
Suggested Group Art Unit::	None
CD-ROM or CD-R?::	None
Number of CD disks::	0
Number of copies of CDs::	0
Sequence submission?::	Yes – Text File
Computer Readable Form (CRF)?::	
Number of copies of CRF::	
Title::	CORN EVENT DAS-59122-7 AND METHODS FOR DETECTION THEREOF
Attorney Docket Number::	035718/387563
Request for Early Publication?::	No
Request for Non-Publication?::	No
Suggested Drawing Figure::	None
Total Drawing Sheets::	0
Small Entity::	No
Petition Included?::	No
Petition Type::	None
Licensed US Govt. Agency::	No
Contract or Grant Numbers::	None
Secrecy Order in Parent Appl.?::	No

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Postal or Zip Code of mailing address::	19701

Applicant Authority Type::	Inventor
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Status::	Full Capacity
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Family Name::	Wang
Name Suffix::	
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State or Province of mailing address::	Iowa
Country of mailing address::	United States of America
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Primary Citizenship Country::	United States of America
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Country of Residence::	United States of America
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City of mailing address::	Urbandale
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Country of mailing address::	United States of America
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Primary Citizenship Country::	United States of America
Status::	Full Capacity
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Family Name::	Zhong
Name Suffix::	
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Country of Residence::	United States of America
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City of mailing address::	Urbandale
State or Province of mailing address::	Iowa
Country of mailing address::	United States of America
Postal or Zip Code of mailing address::	50322

Correspondence Information

Correspondence Customer Number:: 29122

Representative Information

Representative Customer Number:: 29122

Domestic Priority Information

Application::	Continuity Type::	Parent Application::	Parent Filing Date::
This Application	Divisional/Utility Application	11/938,483	11/12/2007
Which Claims Priority from	Utility Application	11/237,222	09/28/2005
Which Claims Priority From	Provisional	60/614,225	09/29/2004

Foreign Priority Information

Country::	Application Number::	Filing Date::	Priority Claimed::

Assignee Information

Assignee name:: Pioneer Hi-Bred International, Inc.
Street of mailing address:: 7110 NW 62nd Avenue
City of mailing address:: Johnston
State or Province of mailing address:: Iowa
Country of mailing address:: United States of America
Postal or Zip Code of mailing address:: 50131-1014

Assignee name:: E. I. Du Pont De Nemours and Company
Street of mailing address:: 1007 Market Street
City of mailing address:: Wilmington
State or Province of mailing address:: Delaware
Country of mailing address:: United States of America
Postal or Zip Code of mailing address:: 19898

Assignee name:: Dow AgroSciences LLC
Street of mailing address:: 9330 Zionsville Road
City of mailing address:: Indianapolis
State or Province of mailing address:: Indiana
Country of mailing address:: United States of America
Postal or Zip Code of mailing address:: 46268

Signature: _____/david m. saravitz/

Attorney/Agent of Record: David M. Saravitz

Attorney/Agent Registration No. 55,593

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ELECTRONICALLY FILED USING THE EFS-WEB ELECTRONIC FILING SYSTEM OF THE UNITED STATES PATENT & TRADEMARK OFFICE ON OCTOBER 19, 2010.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re: James Wayne Bing et al.
Appl. No.: 11/938,483
Filed: November 12, 2007
For: CORN EVENT DAS-59122-7
AND METHODS FOR DETECTION
THEREOF

Group Art Unit: 1638
Examiner Name: Anne R. Kubelik
Confirmation No.: 4077

COPY

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

**REVOCATION OF POWER OF ATTORNEY
AND NEW POWER OF ATTORNEY BY ASSIGNEE
AND CHANGE OF CORRESPONDENCE ADDRESS**

Pioneer Hi-Bred International, Inc., E.I. DuPont deNemours and Company, and Dow AgroSciences LLC, the Assignees of record hereby revoke all powers of attorney previously granted with respect to the above-identified patent application, and appoints the practitioners associated with the Customer Number provided below to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith, and directs that all correspondence be addressed to that Customer Number:

Customer Number 29122

with full power of substitution and revocation to transact all business in the Patent and Trademark Office in connection therewith.

Please direct telephone calls to the attention of:

W. Murray Spruill
Registration No. 32,943
Tel Charlotte Office (704) 444-1000
Fax Charlotte Office (704) 444-1111

Pioneer Hi-Bred International, Inc., E.I. DuPont deNemours and Company, and Dow AgroSciences LLC, the assignees of record, hereby elects under 37 C.F.R. § 3.71 to prosecute this patent application and certifies that they are the assignees of the entire right, title, and interest in the patent application identified above by virtue of the **§ 3.73(b) information cited below**:

Assignments from the inventor(s) of the patent application identified above.
The assignments were recorded under US Provisional Application No. 60/614,225 in the United States Patent and Trademark Office at Reel 016658, Frame 0251 and at Reel 016876, Frame 0849.

☒ As required by 37 CFR 3.73(b)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

The undersigned (whose title is supplied below) is empowered to sign this certificate on behalf of the Assignee.

Assignee of Record:

Pioneer Hi-Bred International, Inc.

By: Louise A. Foutch

Print Name: Louise A. Foutch

Title: Assistant Secretary

Date: 2-4-2010

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LEGAL02/31372667v1

Revocation and New Power of Attorney

Page 2

- ☒ As required by 37 CFR 3.73(b)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

The undersigned (whose title is supplied below) is empowered to sign this certificate on behalf of the Assignee.

Assignee of Record:

E.I. DuPont deNemours and Company

By: Barbara Massie

Print Name: Barbara Massie

Title: Assistant Secretary - Patent Board

Date: February 3, 2010

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LEGAL02/31372667v1

☒ As required by 37 CFR 3.73(b)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

The undersigned (whose title is supplied below) is empowered to sign this certificate on behalf of the Assignee.

Assignee of Record:

Dow AgroSciences LLC

By: Andrew T Borucki

Print Name: Andrew T Borucki

Title: General Patent Counsel

Date: Feb 5, 2010

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LEGAL/02/31372667v1

Substitute for form 1449/PTO (Revised 07/2007) INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Use as many sheets as necessary)</i>				Complete if Known	
				Application Number	To be assigned
				Filing Date	Concurrently herewith
				First Named Inventor	James Wayne Bing
				Art Unit	To be assigned
				Examiner Name	To be assigned
Sheet	1	of	2	Attorney Docket Number	035718/387563

US PATENT DOCUMENTS						
Examiner Initials*	Cite No.	Document Number Number - Kind Code (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages of Relevant Figures Appear	
	1	US-5,474,796	12-12-1995	Brennan		
	2	US-5,541,308	07-30-1996	Hogan et al.		
	3	US-6,232,063	05-15-2001	Beckmann et al.		
	4	US-6,372,480	04-16-2002	Narva et al.		
	5	US-6,395,485	05-28-2002	DeBeuckeleer		
	6	US-6,458,584	10-01-2002	Mirzabekov et al.		
	7	US-6,825,400	11-30-2004	Behr et al.		
	8	US-7,112,721	09-26-2006	Fabijanski et al.		
	9	US-7,323,556	01-29-2008	Bing et al.		
	10	US-2002/0013960	01-31-2002	Behr et al.		
	11	US-2002/0102582	08-01-2002	Levine		
	12	US-2002/0199215	12-26-2002	Boets et al.		
	13	US-2003/0198943	10-23-2003	Remacle et al.		
	14	US-2006/0141495	06-29-2006	Wu		
	15	US-2008/0166725	07-10-2008	Bing et al.		
	16	US-2008/0166726	07-10-2008	Bing et al.		
	17	US-2008/0171334	07-17-2008	Bing et al.		
	18	US-2008/0182256	07-31-2008	Bing et al.		
FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No.	Foreign Patent Document Country Code - Number Kind Code (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	English Language Translation Attached
	19	WO 84/02913	08-02-1984	Monsanto Company		
	20	EP 0 857 791 A2	12-08-1998	Boehringer Mannheim GmbH		
	21	WO 01/14417	03-01-2001	Mycogen Corporation		
	22	EP 1 167 531 A1	02-01-2002	Monsanto Technology, LLC		
Examiner Signature				Date Considered		

*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Substitute for form 1449/PTO (Revised 07/2007) INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Use as many sheets as necessary)</i>				Complete if Known	
				Application Number	To be assigned
				Filing Date	Concurrently herewith
				First Named Inventor	James Wayne Bing
				Art Unit	To be assigned
				Examiner Name	To be assigned
Sheet	2	of	2	Attorney Docket Number	035718/387563

FOREIGN PATENT DOCUMENTS (CONT.)						
	23	WO 2002/15701	02-28-2002	Syngenta Participations AG		
	24	WO 03/052073	06-26-2003	Syngenta Participations AG		
	25	WO 2004/011702 A2	02-05-2004	Monsanto Technology LLC		
OTHER DOCUMENTS						
Examiner Initials*	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.				English Language Translation Attached
	26	BUCK, <i>et al.</i> , "Design Strategies and Performance of Custom DNA Sequencing Primers," <i>BioTechniques</i> , 1999, Vol. 27, pp. 528-536.				
	27	CRICKMORE, <i>et al.</i> , http://www.lifesci.sussex.ac.uk/Home/Neil_Crickmore/Bt/ , 2009, pp. 1-11.				
	28	ELLIS, <i>et al.</i> , "Novel <i>Bacillus thuringiensis</i> Binary Insecticidal Crystal Proteins Active on Western corn Rootworm, <i>Diabrotica virgifera virgifera</i> LeConte, <i>App and Envir Microbiology</i> , Vol 63(3), pp. 1137-1145, XP002985898.				
	29	HERMAN, <i>et al.</i> , "Binary Insecticidal Crystal Protein from <i>Bacillus thuringiensis</i> , Strain PS149B1: Effects of Individual Protein Components and Mixtures in Laboratory Bioassays," <i>Journal of Economic Entomology</i> , 2002, Vol. 95(3), pp. 635-639.				
	30	HUNST AND ROOD, "Application for the Determination of Nonregulated Status for Bt Cry/34/35Ab1 Insect-Resistant, Glufosinate-Tolerant Corn: Corn Line 59122, U.S. Department of Agriculture, Animal and Plant Health Inspection Service, 2004, pp. 1-237, XP 002384226.				
	31	LOWE, <i>et al.</i> , "A computer program for selection of oligonucleotide primers for polymerase chain reactions," <i>Nucleic Acids Research</i> , 1990, Vol. 18(7), pp. 1757-1761.				
	32	MOELLENBECK, <i>et al.</i> , "Insecticidal proteins from <i>Bacillus thuringiensis</i> protect corn from corn rootworms," <i>nature biotechnology</i> , 2001, Vol. 19, pp. 668-672.				
	33	RICKER, Karin, "Biotechnology Consultation Note to the File BNF No. 000081, U.S. Food and Drug Administration (2004), Pages 1-6, XP002384225.				
	34	Stratagene Catalog, page 40, 1988.				
	35	Sequence Search Reports, OM nucleic – nucleic search, 2009, pp. 1-6.				
	36	WHITELAW, <i>et al.</i> PUFTW67TB ZM_0.6_1.0KB Zea mays genomic clone ZMMBTa0732K13, genomic survey sequence, 2003, EMBL Accession No. CG069192.				
	37	WHITELAW, <i>et al.</i> GenBank Accession No.BZ739496, 2003.				
	38	ZAMBRYSKI, <i>et al.</i> , GenBank Accession N. TIP37TD2, 1996.				

Examiner Signature		Date Considered	
--------------------	--	-----------------	--

*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re:	Bing et al.	Confirmation No.:	To be assigned
Appl. No.:	To be assigned	Group Art Unit:	To be assigned
Filed:	Concurrently herewith	Examiner:	To be assigned
For:	CORN EVENT DAS-59122-7 AND METHODS FOR DETECTION THEREOF		

Mail Stop Application
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

**INFORMATION DISCLOSURE STATEMENT
CITATION UNDER 37 C.F.R. § 1.97**

Attached is a list of documents on form PTO-1449. It is requested that the Examiner consider these documents and officially make them of record in accordance with the provisions of 37 C.F.R. § 1.97 and Section 609 of the MPEP. By identifying the listed documents, Applicant in no way makes any admission as to the prior art status of the listed documents, but is instead identifying the listed documents for the sake of full disclosure.

Any foreign patents or non-patent literature documents items are attached, except those that were supplied in, or cited by the Office during prosecution of, parent Application No. 11/938,483 filed November 12, 2007. Since the benefit of this application was claimed under 35 U.S.C. 120, no copies need to be furnished in accordance with 37 C.F.R. 1.98(d); however, copies will be furnished on request.

Respectfully submitted,

/david m. saravitz/

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ELECTRONICALLY FILED USING THE EFS-WEB ELECTRONIC FILING SYSTEM OF THE UNITED STATES PATENT & TRADEMARK OFFICE ON OCTOBER 19, 2010.

Electronic Patent Application Fee Transmittal				
Application Number:				
Filing Date:				
Title of Invention:		CORN EVENT DAS-59122-7 AND METHODS FOR DETECTION THEREOF		
First Named Inventor/Applicant Name:		James Wayne Bing		
Filer:		David Michael Saravitz/Evelyn Casey		
Attorney Docket Number:		035718/387563		
Filed as Large Entity				
Utility under 35 USC 111(a) Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Utility application filing	1011	1	330	330
Utility Search Fee	1111	1	540	540
Utility Examination Fee	1311	1	220	220
Pages:				
Claims:				
Independent claims in excess of 3	1201	1	220	220
Miscellaneous-Filing:				
Petition:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				1310

Electronic Acknowledgement Receipt	
EFS ID:	8655624
Application Number:	12907488
International Application Number:	
Confirmation Number:	2088
Title of Invention:	CORN EVENT DAS-59122-7 AND METHODS FOR DETECTION THEREOF
First Named Inventor/Applicant Name:	James Wayne Bing
Customer Number:	29122
Filer:	David Michael Saravitz/Evelyn Casey
Filer Authorized By:	David Michael Saravitz
Attorney Docket Number:	035718/387563
Receipt Date:	19-OCT-2010
Filing Date:	
Time Stamp:	15:51:49
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	\$1310
RAM confirmation Number	2446
Deposit Account	160605
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees) Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)	

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)					
Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)					
Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)					
File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal of New Application	1895D9_387563_Transmittal.pdf	138825 caea149e0e9fc8b4c7cde59d7f13f28e06249bc8	no	2
Warnings:					
Information:					
2		1895D9_387563_Application.pdf	1689047 5116dfd006824fc47afe9f4fa44c4796c5cdfbab	yes	44
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Specification		1	41	
	Claims		42	43	
	Abstract		44	44	
Warnings:					
Information:					
3	Drawings-only black and white line drawings	1895D9_387563_Figures.pdf	306127 b34a4799f5d2129e2f1ea67898c3e2d1c34417ed	no	7
Warnings:					
Information:					
4	Oath or Declaration filed	1895D9_387563_Declaration.pdf	141419 862b75394c8995c5a3952fd597c8b92282627295	no	13
Warnings:					
Information:					
5	Application Data Sheet	1895D9_387563_ADS.pdf	103872 dd36910ea0a28db6b657649073301fe23fb00797	no	11
Warnings:					
Information:					
This is not an USPTO supplied ADS fillable form					
6	Power of Attorney	1895D9_387563_RevocationPOA_NewPOA.pdf	73290 b51f294f01048e772bea49494b40e6c48f0a6e91	no	4

Warnings:					
Information:					
7	Information Disclosure Statement (IDS) Filed (SB/08)	1895D9_387563_1449.pdf	125271 eb4f0fd2312fb5f7f55bfb936d45131933adc23d	no	2
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
8	Sequence Listing (Text File)	387563_SeqLst.TXT	58679	no	0
Warnings:					
Information:					
9	Transmittal Letter	1895D9_387563_IDS.pdf	86372 ddbfb9f292636dd4b62de46e63715598be30faca	no	1
Warnings:					
Information:					
10	Fee Worksheet (PTO-875)	fee-info.pdf	36577 bbfb10f6cdf51b1de900153749a22a9adcd807e6	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			2759479		
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. <u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.					

Date: 10/19/2010

PTO/SB/06 (10-07)
Approved for use through 06/30/2010. OMB 0651-0032

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875					Application or Docket Number 12/907,488	
APPLICATION AS FILED – PART I						
(Column 1)		(Column 2)		SMALL ENTITY		OR
OTHER THAN SMALL ENTITY						
FOR	NUMBER FILED	NUMBER EXTRA	RATE (\$)	FEE (\$)	RATE (\$)	FEE (\$)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A		N/A	330
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A		N/A	540
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A		N/A	220
TOTAL CLAIMS (37 CFR 1.16(i))	9	minus 20 = *	X 26=		X 52=	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	4	minus 3 = *	X 110=		X 220=	220
APPLICATION SIZE FEE (37 CFR 1.16(s))						
If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$270 (\$135 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR						
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))			195		390	
			TOTAL		TOTAL	1310
* If the difference in column 1 is less than zero, enter "0" in column 2.						
APPLICATION AS AMENDED – PART II						
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY
OTHER THAN SMALL ENTITY						OR
AMENDMENT A						
CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	RATE (\$)	ADDITIONAL FEE (\$)
Total (37 CFR 1.16(i))	*	Minus **	X =		X =	
Independent (37 CFR 1.16(h))	*	Minus ***	X =		X =	
Application Size Fee (37 CFR 1.16(s))			N/A		N/A	
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))			TOTAL		TOTAL	
			ADD'T FEE		ADD'T FEE	
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY
OTHER THAN SMALL ENTITY						OR
AMENDMENT B						
CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	RATE (\$)	ADDITIONAL FEE (\$)
Total (37 CFR 1.16(i))	*	Minus **	X =		X =	
Independent (37 CFR 1.16(h))	*	Minus ***	X =		X =	
Application Size Fee (37 CFR 1.16(s))			N/A		N/A	
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))			TOTAL		TOTAL	
			ADD'T FEE		ADD'T FEE	
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.						

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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Sequence Listing was accepted.

If you need help call the Patent Electronic Business Center at (866)
217-9197 (toll free).

Reviewer: Durreshwar Anjum

Timestamp: [year=2010; month=10; day=25; hr=13; min=59; sec=9; ms=116;]

=====

Application No: 12907488

Version No: 1.0

Input Set:

Output Set:

Started: 2010-10-19 15:54:08.743
Finished: 2010-10-19 15:54:11.834
Elapsed: 0 hr(s) 0 min(s) 3 sec(s) 91 ms
Total Warnings: 40
Total Errors: 0
No. of SeqIDs Defined: 40
Actual SeqID Count: 40

Error code	Error Description
W 213	Artificial or Unknown found in <213> in SEQ ID (1)
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Error code

Error Description

This error has occurred more than 20 times, will not be displayed

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 Luckring, Abigail K.
 Meyer, Sandra E.
 Moellenbeck, Daniel
 Narva, Kenneth Edwin
 Olson, Paul D.
 Sanders, Craig D.
 Wang, Jimei
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 DETECTION THEREOF

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gcaggccatc cctcgacata gcacccaaga actcgtacc ctgggat 2987

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/907,488	10/19/2010	James Wayne Bing	035718/387563

CONFIRMATION NO. 2088

POA ACCEPTANCE LETTER

29122
ALSTON & BIRD LLP
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Date Mailed: 10/28/2010

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 10/19/2010.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/lchau/

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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
12/907,488	10/19/2010	1638	1310	035718/387563	9	4

CONFIRMATION NO. 2088

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FILING RECEIPT



OC000000044211201

Date Mailed: 10/28/2010

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

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Assignment For Published Patent Application

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E. I. DU PONT DE NEMOURS AND COMPANY, WILMINGTON, DE
DOW AGROSCIENCES LLC, INDIANA, IN

Power of Attorney: The patent practitioners associated with Customer Number 29122

Domestic Priority data as claimed by applicant

This application is a DIV of 11/938,483 11/12/2007
which is a DIV of 11/237,222 09/28/2005 PAT 7,323,556

which claims benefit of 60/614,225 09/29/2004

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If Required, Foreign Filing License Granted: 10/26/2010

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Title

CORN EVENT DAS-59122-7 AND METHODS FOR DETECTION THEREOF

Preliminary Class

800

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page 2 of 3

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12/907,488	10/19/2010	JAMES WAYNE BING	035718/387563

CONFIRMATION NO. 2088

29122

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PIONEER HI-BRED INTERNATIONAL, INC.

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NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

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Substitute for form 1449/PTO (Revised 07/2007) INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Use as many sheets as necessary)</i>				Complete if Known	
				Application Number	12/907,488
				Filing Date	October 19, 2010
				First Named Inventor	James Wayne Bing
				Art Unit	1638
Examiner Name	Anne R. Kubelik				
Sheet	1	of	1	Attorney Docket Number	035718/387563

US PATENT DOCUMENTS					
Examiner Initials*	Cite No.	<u>Document Number</u> Number - Kind Code (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages of Relevant Figures Appear

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No.	<u>Foreign Patent Document</u> Country Code - Number Kind Code (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	English Language Translation Attached
	39	WO 2004/011601 A2	02-05-2004	Monsanto Technology		

OTHER DOCUMENTS			
Examiner Initials*	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s) , volume-issue number(s), publisher, city and/or country where published.	English Language Translation Attached
	40	HAMMACK, L., et al., "Larval Sampling and Instar Determination in Field Populations of Northern and Western Corn Rootworm (Coleoptera: Chrysomelidae)," Journal of Economic Entomology, 2003, Vol. 96(4), pp. 1153-1159.	

Examiner Signature		Date Considered	
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*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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

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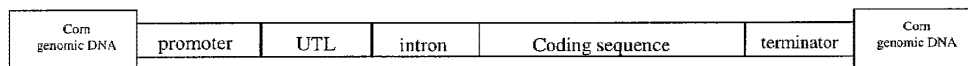
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- without international search report and to be republished upon receipt of that report
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: CORN EVENT PV-ZMIR13 (MON863) PLANTS AND COMPOSITIONS AND METHODS FOR DETECTION THEREOF

[1] [8] [2] [3] [4] [5] [6] [9] [7]



(57) Abstract: The present invention provides compositions and methods for detecting the presence of the corn event MON863 DNA inserted into the corn genome from the transformation of the recombinant construct containing a Cry3Bb gene and of genomic sequences flanking the insertion site. The present invention also provides the corn event MON863 plants, progeny and seeds thereof that contain the corn event MON863 DNA.

WO 2004/011601 A2

**Corn Event Pv-Zmir13 (MON863) Plants and Compositions and
Methods for Detection thereof**

FIELD OF THE INVENTION

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The present invention relates to the field of plant molecular biology. The invention more specifically relates to a coleopteran resistant corn plant (*Zea mays*) PV-ZMIR13, designated MON863, and to seeds and progeny of the corn plant MON863. The corn plant MON863 and its progeny are particularly resistant to *Diabrotica vergifera*, *Diabrotica undecimpunctata*, and *Leptinotarsa decemlineata*.

10

The present invention more specifically also relates to a DNA construct inserted into the corn plant genome in event MON863 for conferring resistance to insect infestation by a coleopteran species. The present invention also relates to assays for detecting the presence of a corn plant MON863 DNA in a sample and compositions thereof.

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BACKGROUND OF THE INVENTION

Corn is an important crop and is a primary food source in many areas of the world. The methods of biotechnology have been applied to corn plants for improvement of the agronomic traits and the quality of the product. Expression of foreign genes in plants is known to be influenced by their chromosomal position, perhaps due to chromatin structures (e.g., heterochromatin) or the proximity of transcriptional regulation elements (e.g., enhancers) close to the integration site (Weising *et al.*, Ann. Rev. Genet 22:421-477, 1988). For this reason, it is often necessary to screen a large number of events in order to identify an event characterized by optimal expression of an introduced gene of interest. For example, it has been observed in plants and in other organisms that there may be a wide variation in levels of expression of an introduced gene among events. There may also be differences in spatial or temporal patterns of expression, for example, differences in the relative expression of a transgene in various plant tissues, that may not correspond to the patterns expected from transcriptional regulatory elements present in the introduced gene construct. For this reason, it is common to produce hundreds to thousands of different events and screen those events for a single event that has desired transgene expression levels and patterns for commercial purposes. An event that has desired levels or patterns of transgene expression is useful for introgressing the transgene into other genetic backgrounds by sexual outcrossing using

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conventional breeding methods. Progeny of such crosses maintain the transgene expression characteristics of the original transformant. This strategy is used to ensure reliable gene expression in a number of varieties that are well adapted to local growing conditions.

It would be advantageous to be able to detect the presence of a particular event in order to determine whether progeny of a sexual cross contain a transgene of interest. In addition, a method for detecting a particular event would be helpful for complying with regulations requiring the premarket approval and labeling of food derived from recombinant crop plants, for example. It is possible to detect the presence of a transgene by any well-known nucleic acid detection method such as the polymerase chain reaction (PCR) or DNA hybridization using nucleic acid probes. These detection methods generally focus on frequently used genetic elements, such as promoters, terminators, marker genes, etc. As a result, such methods may not be useful for discriminating between different events, particularly those produced using the same DNA construct unless the sequence of chromosomal DNA adjacent to the inserted DNA ("flanking DNA") is known. An event-specific PCR assay is discussed, for example, by Windels *et al.* (Med. Fac. Landbouww, Univ. Gent 64/5b: 459-462, 1999), who identified glyphosate tolerant soybean event 40-3-2 by PCR using a primer set spanning the junction between the insert and flanking DNA, specifically one primer that included sequence from the insert and a second primer that included sequence from flanking DNA.

SUMMARY OF THE INVENTION

According to one preferred embodiment of the present invention, compositions and methods are provided for detecting the presence of the transgene/genomic insertion region from a novel corn plant PV-ZMIR13, designated MON863. DNA sequences are provided that comprise at least one junction sequence of MON863 selected from the group consisting of SEQ ID NO:1 (arbitrarily assigned 5' end insert-to-genome junction) and SEQ ID NO:2 (arbitrarily assigned 3' end insert-to-genome junction) and complements thereof, wherein the junction sequence spans the junction between a heterologous DNA inserted into the corn genome and the DNA from the corn cell flanking the insertion site and is diagnostic for the event.

According to another preferred embodiment of the present invention, DNA sequences that comprise the novel transgene/genomic insertion region, SEQ ID NO:3 (sequence containing

the arbitrarily assigned 5' end of the inserted DNA) and SEQ ID NO:4 (sequence containing the arbitrarily assigned 3' end of the inserted DNA) for example, are disclosed.

According to still another preferred embodiment of the present invention, the DNA sequences that comprise at least from about 11 to about 50 or more nucleotides of the 5' transgene portion of the DNA sequence of SEQ ID NO:7 and a similar length of 5' flanking corn DNA sequence of SEQ ID NO:5, or a similar length of 3' transgene portion of the DNA sequence of SEQ ID NO:8 and a similar length of 3' flanking corn DNA of SEQ ID NO:6, for use as DNA primers in DNA amplification methods are also disclosed in the present invention. Amplicons produced using these primers are diagnostic for corn event MON863.

10 An amplicon produced by a first DNA primer homologous or complementary to SEQ ID NO:7 coupled with a second DNA primer homologous or complementary to SEQ ID NO:5, when both are present together in a reaction mixture with corn event MON863 DNA in a sample are an aspect of the present invention. An amplicon produced by a third DNA primer homologous or complementary to SEQ ID NO:8 coupled with a fourth DNA primer

15 homologous or complementary to SEQ ID NO:6, when both are present together in a reaction mixture with corn event MON863 DNA in a sample, are another aspect of the present invention. The corn plant MON863 and progeny derived therefrom that contain these DNA sequences used in a DNA amplification reaction to provide one or more diagnostic amplicons are aspects of the invention.

20 According to yet another preferred embodiment of the present invention, methods of detecting the presence of a DNA corresponding to the corn event MON863 event in a sample are provided. Such methods comprise the steps of: (a) contacting a biological sample suspected of containing an event MON863 DNA with a primer pair that, when used in a nucleic acid amplification reaction with said DNA, produces an amplicon that is diagnostic

25 for the corn event MON863; (b) performing a nucleic acid amplification reaction, thereby producing the amplicon; and (c) detecting the amplicon. The amplicons specifically exemplified herein correspond to a first amplicon of about 508 base pairs as set forth in SEQ ID NO:3 and a second amplicon of about 584 base pairs as set forth in SEQ ID NO:4, or longer or shorter amplicons, wherein said first amplicon contains as least a nucleotide

30 sequence corresponding to SEQ ID NO:1 from about nucleotide 1 through about nucleotide 11 or from about nucleotide 10 through about nucleotide 20 and said second amplicon contains at least a nucleotide sequence corresponding to SEQ ID NO:2 from about nucleotide 1 through about nucleotide 11 or from about nucleotide 10 through about nucleotide 20.

According to yet another preferred embodiment of the present invention, methods of detecting the presence of a DNA corresponding to the MON863 event in a sample are provided. Such methods comprise the steps of: (a) contacting a biological sample suspected of containing an event MON863 DNA with a probe that hybridizes under stringent hybridization conditions with said DNA and that does not hybridize under stringent hybridization conditions with DNA from a control corn plant that does not contain an inserted DNA derived from pMON25097; (b) subjecting the sample and the probe to stringent hybridization conditions; and (c) detecting hybridization of the probe to the genomic DNA, wherein detection of probe binding to said DNA is diagnostic for the presence of event MON863 DNA in said sample.

According to a further preferred embodiment of the present invention, there is provided a novel corn plant MON863, that comprises DNA sequences comprising the novel transgene/genomic insertion regions as set forth in SEQ ID NO:3 and SEQ ID NO:4. The seeds of the plants of MON863, the progeny of the plants of MON863 and the methods for producing a corn plant by crossing the corn plant MON863 with itself or with another corn plant are further embodiments of the present invention.

The foregoing and other preferred embodiments of the present invention will become more apparent from the following detailed descriptions.

BRIEF DESCRIPTION OF THE DRAWINGS AND SEQUENCES

Description of Drawings

Figure 1 illustrates a plant expression vector PV-ZMIR13, also designated herein as pMON25097, from which the corn rootworm event MON863 is generated through particle acceleration technology using a *Mlu* I restriction fragment from about nucleotide position 149 through about nucleotide position 4840.

Figure 2 is a graphical map illustrating the general organization of the elements comprising the heterologous nucleic acid sequences inserted into the corn event MON863 genome and essentially sets forth the positions at which the inserted nucleic acid sequences are linked to corn genomic DNA sequences designated herein as corn genomic nucleic acid sequences which flank the ends of the inserted heterologous DNA sequences; the corn event MON863 being characterized as follows: corn genomic DNA [1] flanking the arbitrarily assigned 5' end of the full length primary functional inserted DNA sequence is adjacent to a

non-naturally occurring CaMV35S AS4 promoter sequence [2] (P-CaMV.AS4, SEQ ID NO:17) operably connected to a wheat chlorophyll A/B binding protein untranslated leader sequence [3] (L-Ta.hcb1, SEQ ID NO:18) operably connected to a rice actin intron sequence [4] (I-Os.Act1, SEQ ID NO:19) operably connected to a non-naturally occurring sequence encoding Cry3Bb variant protein [5] (SEQ ID NO:20) operably connected to a wheat heat shock Hsp17 transcription termination and polyadenylation sequence [6](T-Ta.Hsp17, SEQ ID NO:21), and the full-length primary functional inserted DNA sequence being flanked by the corn genomic DNA at the arbitrarily assigned 3' end [7], in which the junction between [1] and [2] ([8]) corresponds to SEQ ID NO:1, and the junction between [6] and [7] ([9]) corresponds to SEQ ID NO:2.

Description of Sequences

SEQ ID NO:1 corresponds to a junction sequence between corn genome and inserted DNA that is diagnostic for the arbitrarily assigned 5' end of the full-length primary functional inserted DNA sequence in the corn event MON863.

SEQ ID NO:2 corresponds to a junction sequence between corn genome and inserted DNA that is diagnostic for the arbitrarily assigned 3' end of the full-length primary functional inserted DNA sequence in the corn event MON863.

SEQ ID NO:3 corresponds to the sequences represented substantially by [1] and [2] of Figure 2.

SEQ ID NO:4 corresponds to the sequences represented substantially by [6] and [7] of Figure 2.

SEQ ID NO:5 corresponds to the partial corn genome DNA sequence that is adjacent to and flanking the 5' end of the arbitrarily assigned 5' end of the partial Cry3Bb DNA coding sequence inserted in the corn event MON863.

SEQ ID NO:6 corresponds to the partial corn genome DNA sequence that is adjacent to and flanking the 3' end of the arbitrarily assigned 3' end of the partial Cry3Bb DNA coding sequence inserted in the corn event MON863.

SEQ ID NO:7 corresponds to the sequence of the arbitrarily assigned 5' end of the partial Cry3Bb DNA coding sequence inserted in the corn event MON863.

SEQ ID NO:8 corresponds to the sequence of the arbitrarily assigned 3' end of the partial Cry3Bb DNA coding sequence inserted in the corn event MON863.

SEQ ID NO:9 corresponds to a 5' primer sequence (primer A) complementary to a part of the corn genomic DNA sequence identified as flanking the arbitrarily assigned 5' end of the full length primary functional inserted DNA sequence in the corn event MON863, and when paired with a primer corresponding to the reverse complement of the sequence set forth in SEQ ID NO:10 and template DNA of the corn event MON863, produces an amplicon comprising SEQ ID NO:3 that is diagnostic for the corn event MON863 DNA in a sample.

SEQ ID NO:10 corresponds to the reverse complement of a 3' primer sequence (primer B) complementary to a part of the arbitrarily assigned 5' end sequence of the full length primary functional DNA inserted into the corn genome in the corn event MON863, and when paired with a primer corresponding to the sequence set forth in SEQ ID NO:9 and template DNA of the corn event MON863, produces an amplicon comprising SEQ ID NO:3 that is diagnostic for the corn event MON863 DNA in a sample.

SEQ ID NO:11 corresponds to a 5' primer sequence (primer C) complementary to part of the arbitrarily assigned 3' end sequence of the full length primary functional DNA inserted into the corn genome in the corn event MON863, and when paired with a primer corresponding to the reverse complement of the sequence set forth in SEQ ID NO:12 and template DNA of the corn event MON863, produces an amplicon having SEQ ID NO:4 that is diagnostic for the corn event MON863 DNA in a sample.

SEQ ID NO:12 corresponds to the reverse complement of a 3' primer sequence (primer D) complementary to a part of the corn genomic DNA sequence identified as flanking the arbitrarily assigned 3' end of the full length primary functional inserted DNA sequence in corn event MON863, and when paired with a primer corresponding to the sequence set forth in SEQ ID NO:11 and the template DNA of the corn event MON863, produces an amplicon having SEQ ID NO:4 that is diagnostic for corn event MON863 DNA in a sample.

SEQ ID NO:13 corresponds to a 5' genome walker primer 1.

SEQ ID NO:14 corresponds to a 5' genome walker primer 2.

SEQ ID NO:15 corresponds to a 3' genome walker primer 1.

SEQ ID NO:16 corresponds to a 3' genome walker primer 2.

SEQ ID NO:17 corresponds to CaMV35S AS4 promoter sequence.

SEQ ID NO:18 corresponds to a wheat chlorophyll A/B binding protein untranslated leader sequence (L-Ta.hcb1).

SEQ ID NO:19 corresponds to a rice actin intron sequence (I-Os.Act1).

SEQ ID NO:20 corresponds to a non-naturally occurring sequence encoding a Cry3Bb variant protein.

SEQ ID NO:21 corresponds to wheat heat shock Hsp17 transcription termination and polyadenylation sequence (T-Ta.Hsp17).

5

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The following definitions and methods are provided to better define the present invention and to guide those of ordinary skill in the art in the practice of the present invention. Unless otherwise noted, terms are to be understood according to conventional usage by those of ordinary skill in the relevant art. Definitions of common terms in molecular biology may also be found in Rieger *et al.*, *Glossary of Genetics: Classical and Molecular*, 5th edition, Springer-Verlag: New York, 1991; and Lewin, *Genes V*, Oxford University Press: New York, 1994. The nomenclature for DNA bases as set forth at 37 CFR § 1.822 is used.

As used herein, the term "biological sample", or "sample", is intended to include nucleic acids, polynucleotides, DNA, RNA, tRNA, cDNA, and the like in a composition or fixed to a substrate which enables the sample to be subjected to molecular probe analysis or thermal amplification using oligonucleotide probes and/or primers.

As used herein, the term "corn" means *Zea mays* or maize and includes all plant varieties that can be bred with corn, including wild maize species.

As used herein, the term "comprising" means "including but not limited to".

As used herein, the term "diagnostic" refers to the fact that, for the purposes of identifying nucleic acid sequences as those contained within or derived from the corn event MON863, any one or more of the novel DNA sequences set forth herein comprise the corn genome flanking sequences adjacent to and linked to the arbitrarily assigned ends of the inserted heterologous DNA sequences are necessary and sufficient as being descriptive as a distinguishing characteristic of the corn event MON863 genome, so long as the sequence comprises at least a part of one of the ends of the inserted heterologous DNA sequence or the corn genome sequence flanking or adjacent to one of these ends and includes at least the two nucleotides, the di-nucleotide, comprising the point at which the corn genome sequence and the inserted heterologous DNA sequence are linked together by a phosphodiester bond. It is well known in the art that a sequence which is diagnostic for a particular event, such as those disclosed herein for the corn event MON863, which is not present in a particular sample containing corn genome nucleic

acids, is indicative that the sample does not contain the diagnostic sequence and therefore the nucleic acids in the sample are not or were not derived from and have not been contained within the genome of the corn event MON863. In addition, additional novel and diagnostic sequences are present within the corn event MON863 DNA as exemplified
5 herein selected from the group consisting of SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3, and SEQ ID NO:4 and complements thereof.

A transgenic "event" is produced by transformation of plant cells with a heterologous DNA, *i.e.*, a nucleic acid construct that includes a transgene of interest, regeneration of a population of plants resulting from the insertion of the transgene into the genome of the plant,
10 and selection of a particular plant characterized by insertion into a particular genome location. The term "event" refers to the original transformant and progeny of the transformant that include the heterologous DNA. The term "event" also refers to progeny produced by a sexual outcross between the transformant and another variety that include the heterologous DNA. Even after repeated backcrossing to a recurrent parent, the inserted DNA and flanking DNA
15 from the transformed parent is present in the progeny of the cross at the same chromosomal location. The term "event" also refers to DNA from the original transformant comprising the inserted DNA and flanking genomic sequence immediately adjacent to the inserted DNA that would be expected to be transferred to a progeny that receives inserted DNA including the transgene of interest as the result of a sexual cross of one parental line that includes the
20 inserted DNA (*e.g.*, the original transformant and progeny resulting from selfing) and a parental line that does not contain the inserted DNA.

It is also to be understood that two different transgenic plants can also be mated to produce offspring that contain two or more independently segregating exogenous genes (exogenous genes referring nucleotide sequences that are not naturally occurring in the plant
25 genome, *i.e.*, heterogeneous to the corn plant). Selfing of appropriate progeny can produce plants that are homozygous for any combination of the exogenous genes. Backcrossing to a parental plant and out-crossing with a non-transgenic plant are also contemplated, as is vegetative propagation. Descriptions of other breeding methods that are commonly used for different traits and crops can be found in one of several references, *e.g.*, Fehr, in *Breeding*
30 *Methods for Cultivar Development*, Wilcox J. ed., American Society of Agronomy, Madison WI (1987).

A "probe" is an isolated nucleic acid to which a conventional detectable label or reporter molecule, *e.g.*, a radioactive isotope, ligand, chemiluminescent agent, or enzyme may

be linked or attached. Such a probe is complementary to a sequence within a target nucleic acid, in the case of the present invention, to a sequence of genomic DNA from the corn event MON863 whether from a corn plant or from a sample that includes DNA from the event. Probes according to the present invention include not only deoxyribonucleic or ribonucleic acids but also polyamides and other probe materials that bind specifically to a target DNA sequence and can be used to detect the presence of that target DNA sequence.

"Primers" are isolated nucleic acid probes that are annealed to, for any given single primer, a complementary target DNA sequence by nucleic acid hybridization to form a hybrid between the primer and the target DNA sequence, and then extended along the target DNA strand by a polymerase, *e.g.*, a DNA polymerase. Primer pairs of the present invention refer to two or more different primer sequences for is in amplification of a nucleic acid sequence that is between and linked to the target sequences designated as the reverse complement or substantially the reverse complement of the primers, *e.g.*, by the polymerase chain reaction (PCR) or other conventional nucleic-acid amplification methods.

Probes and primers are generally from about 11 nucleotides or more in length, preferably from about 18 nucleotides or more in length, more preferably from about 24 nucleotides or more in length, and most preferably from about 30 nucleotides or more in length. Such probes and primers hybridize specifically to a target sequence under high stringency hybridization conditions. Preferably, probes and primers according to the present invention have complete sequence similarity with the target sequence, although probes differing from the target sequence and that retain the ability to hybridize to target sequences may be designed by conventional methods.

Methods for preparing and using probes and primers are described, for example, in *Molecular Cloning: A Laboratory Manual*, 2nd ed., vol. 1-3, ed. Sambrook *et al.*, Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY, 1989 (hereinafter, "Sambrook *et al.*, 1989"); *Current Protocols in Molecular Biology*, ed. Ausubel *et al.*, Greene Publishing and Wiley-Interscience, New York, 1992 (with periodic updates) (hereinafter, "Ausubel *et al.*, 1992"); and Innis *et al.*, *PCR Protocols: A Guide to Methods and Applications*, Academic Press: San Diego, 1990. PCR-primer pairs can be derived from a known sequence, for example, by using computer programs intended for that purpose such as Primer (Version 0.5, © 1991, Whitehead Institute for Biomedical Research, Cambridge, MA).

Primers and probes constructed based on the flanking DNA, insert sequences, and junction sequences disclosed herein can be used to confirm the presence of the disclosed

sequences in a sample by conventional methods, *e.g.*, by re-cloning and sequencing such sequences.

Any single nucleic acid probe or primer of the present invention hybridizes under stringent conditions to a specific target DNA sequence. Any conventional nucleic acid hybridization or amplification method can be used to identify the presence of DNA from a transgenic event in a sample. Nucleic acid molecules or fragments thereof specifically hybridize to other nucleic acid molecules under certain circumstances. As used herein, two different nucleic acid molecules each comprising different sequences, are said to specifically hybridize to one another if the two molecules form an anti-parallel, double-stranded nucleic acid structure. A nucleic acid molecule is said to be the "complement" of another nucleic acid molecule if they exhibit complete complementarity. As used herein, molecules are said to exhibit "complete complementarity" when every nucleotide of one of the molecules is complementary to a nucleotide of the other. Two molecules are said to be "minimally complementary" if they can hybridize to one another with sufficient stability to permit them to remain annealed to one another under at least conventional "low-stringency" conditions. Similarly, the molecules are said to be "complementary" if they hybridize to one another with sufficient stability to permit them to remain annealed to one another under conventional "high-stringency" conditions. Conventional stringency conditions are described by Sambrook *et al.*, 1989, and by Haymes *et al.* (In: *Nucleic Acid Hybridization, A Practical Approach*, IRL Press, Washington, DC, 1985). Departures from complete complementarity are therefore permissible, as long as such departures do not completely preclude the capacity of the molecules to form a double-stranded structure. In order for a nucleic acid molecule to serve as a primer or probe it needs only be sufficiently complementary in sequence to be able to form a stable double-stranded structure under the particular solvent and salt concentrations employed.

The term "specific for (a target sequence)" indicates that a probe or primer hybridizes under stringent hybridization conditions only to the target sequence in a sample comprising the target sequence, and that the hybridization is detectable.

As used herein, an "isolated" nucleic acid is one that has been substantially separated or purified away from other nucleic acid sequences in the cell of the organism in which the nucleic acid naturally occurs, *i.e.*, other chromosomal and extrachromosomal DNA and RNA, by conventional nucleic acid-purification methods. The term also embraces recombinant nucleic acids and chemically synthesized nucleic acids.

As used herein, a “substantially homologous” sequence is a nucleic acid sequence that specifically hybridizes to the complement of the nucleic acid sequence to which it is being compared, i.e., the target sequence, under high stringency conditions. Appropriate stringency conditions which promote DNA hybridization, for example, 6.0 x sodium chloride/sodium citrate (SSC) at about 45°C, followed by a wash of 2.0 x SSC at 50°C, are known to those skilled in the art or can be found in *Current Protocols in Molecular Biology*, John Wiley & Sons, N.Y., 6.3.1-6.3.6., 1989. For example, the salt concentration in the wash step can be selected from a low stringency of about 2.0 x SSC at 50°C to a high stringency of about 0.2 x SSC at 50°C. In addition, the temperature in the wash step can be increased from low stringency conditions at room temperature, about 22°C, to high stringency conditions at about 65°C. Both temperature and salt may be varied, or either the temperature or the salt concentration may be held constant while the other variable is changed. In a preferred embodiment, a nucleic acid of the present invention will specifically hybridize to one or more of the nucleic acid molecules set forth either in SEQ ID NO:1 or SEQ ID NO:2 or complements thereof or fragments of either under moderately stringent conditions, for example at about 2.0 x SSC and about 65°C. In a particularly preferred embodiment, a nucleic acid of the present invention will specifically hybridize to one or more of the nucleic acid molecules set forth either in SEQ ID NO:1 or SEQ ID NO:2 or complements or fragments of either under high stringency conditions. A nucleic acid of the present invention that hybridizes to a nucleic acid sequence comprising SEQ ID NO:1 or to a nucleic acid sequence comprising SEQ ID NO:3 will not necessarily hybridize to a nucleic acid sequence comprising SEQ ID NO:2 or to a nucleic acid sequence comprising SEQ ID NO:4, and vice versa.

In one aspect of the present invention, a preferred marker nucleic acid molecule of the present invention has the nucleic acid sequence set forth in SEQ ID NO:1 or in SEQ ID NO:2 or complements thereof or fragments of either. In another aspect of the present invention, a preferred marker nucleic acid molecule of the present invention shares between 80% and 100% or between 90% and 100% sequence identity with the nucleic acid sequence set forth in SEQ ID NO:1 and SEQ ID NO:2 or complement thereof or fragments of either. In a further aspect of the present invention, a preferred marker nucleic acid molecule of the present invention shares between 95% and 100% sequence identity with the sequence set forth in SEQ ID NO:1 and SEQ ID NO:2 or complement thereof or fragments of either. SEQ ID NO:1 and SEQ ID NO:2 may be used as markers in plant breeding methods to identify the

progeny of genetic crosses similar to the methods described for simple sequence repeat DNA marker analysis, in *"DNA markers: Protocols, Applications, and Overviews"*, 173-185, Cregan, et al., eds., Wiley-Liss NY, 1997. The hybridization of the probe to the target DNA molecule can be detected by any number of methods known to those skilled in the art, these
5 can include, but are not limited to, fluorescent tags, radioactive tags, antibody based tags, and chemiluminescent tags.

Regarding the amplification of a target nucleic acid sequence (*e.g.*, by PCR) using a particular amplification primer pair, "stringent conditions" are conditions that permit the individual primers in a primer pair to hybridize only to the individual and unique target
10 nucleic-acid sequence to which each primer, comprising the corresponding wild-type sequence (or its complement), would bind, and preferably to produce a unique amplification product, the amplicon, in a DNA thermal amplification reaction.

As used herein, the term "transformation" refers to the transfer of a nucleic acid fragment into the genome of a host organism such as a host plant; resulting in genetically
15 stable inheritance. Host plants containing the transformed nucleic acid fragments are referred to as "transgenic plants".

As used herein, "amplified DNA" or "amplicon" refers to the product of nucleic-acid amplification of a target nucleic acid sequence that is part of a nucleic acid template. For example, to determine whether the corn plant resulting from a sexual cross contains
20 transgenic event genomic DNA from the corn plant MON863 of the present invention, DNA extracted from a corn plant tissue sample may be subjected to a nucleic acid amplification method using a primer pair that includes a primer derived from the flanking sequence in the genome of the plant adjacent to the insertion site of the inserted heterologous DNA, and a second primer derived from the inserted heterologous DNA to produce an amplicon that is
25 diagnostic for the presence of the event DNA. The amplicon is of a length and has a sequence that is also diagnostic for the event. The amplicon may range in length from the combined length of the primer pairs plus one nucleotide base pair, preferably plus about fifty nucleotide base pairs, more preferably plus about two hundred-fifty nucleotide base pairs, and even more preferably plus about four hundred-fifty nucleotide base pairs. Alternatively, a
30 primer pair can be derived from the flanking sequence on both sides of the inserted DNA so as to produce an amplicon that includes the entire insert nucleotide sequence. A member of a primer pair derived from the plant genomic sequence may be located in a distance from the inserted DNA sequence, this distance can range from one nucleotide base pair up to about

twenty thousand nucleotide base pairs. The use of the term "amplicon" specifically excludes primer dimers that may be formed in the DNA thermal amplification reaction.

Nucleic-acid amplification can be accomplished by any of the various nucleic-acid amplification methods known in the art, including the polymerase chain reaction (PCR). A
5 variety of amplification methods are known in the art and are described, *inter alia*, in U.S. Patent Nos. 4,683,195 and 4,683,202 and in *PCR Protocols: A Guide to Methods and Applications*, ed. Innis *et al.*, Academic Press, San Diego, 1990. PCR amplification methods have been developed to amplify up to 22 kb of genomic DNA and up to 42 kb of bacteriophage DNA (Cheng *et al.*, Proc. Natl. Acad. Sci. USA 91:5695-5699, 1994). These
10 methods as well as other methods known in the art of DNA amplification may be used in the practice of the present invention. The sequence of the heterologous DNA insert or the flanking sequence from the corn event MON863 can be verified (and corrected if necessary) by amplifying such sequences from the event using primers derived from the sequences provided herein followed by standard DNA sequencing of the PCR amplicon or of the cloned
15 DNA.

The amplicon produced by these methods may be detected by a plurality of techniques. One such method is Genetic Bit Analysis (Nikiforov, *et al.* Nucleic Acid Res. 22:4167-4175, 1994) where a DNA oligonucleotide is designed which overlaps both the adjacent flanking genomic DNA sequence and the inserted DNA sequence. The
20 oligonucleotide is immobilized in wells of a microwell plate. Following PCR of the region of interest (using one primer in the inserted sequence and one in the adjacent flanking genomic sequence), a single-stranded PCR product can be hybridized to the immobilized oligonucleotide and serve as a template for a single base extension reaction using a DNA polymerase and labelled ddNTPs specific for the expected next base. Readout may be
25 fluorescent or ELISA-based. A signal indicates presence of the insert/flanking sequence due to successful amplification, hybridization, and single base extension.

Another method is the Pyrosequencing technique as described by Winge (Innov. Pharma. Tech. 00:18-24, 2000). In this method an oligonucleotide is designed that overlaps the adjacent genomic DNA and insert DNA junction. The oligonucleotide is hybridized to
30 single-stranded PCR product from the region of interest (one primer in the inserted sequence and one in the flanking genomic sequence) and incubated in the presence of a DNA polymerase, ATP, sulfurylase, luciferase, apyrase, adenosine 5' phosphosulfate and luciferin. DNTPs are added individually and the incorporation results in a light signal that is measured.

The light signal indicates the presence of the transgene insert/flanking sequence due to successful amplification, hybridization, and single or multi-base extension.

Fluorescence Polarization as described by Chen, *et al.*, (Genome Res. 9: 492-498, 1999) is a method that can be used to detect the amplicon of the present invention. Using this method an oligonucleotide is designed which overlaps the genomic flanking and inserted DNA junction. The oligonucleotide is hybridized to single-stranded PCR product from the region of interest (one primer in the inserted DNA and one in the flanking genomic DNA sequence) and incubated in the presence of a DNA polymerase and a fluorescent-labeled ddNTP. A single base extension results in incorporation of the ddNTP. Incorporation can be measured as a change in polarization using a fluorometer. A change in polarization indicates the presence of the transgene insert/flanking sequence due to successful amplification, hybridization, and single base extension.

Taqman® (PE Applied Biosystems, Foster City, CA) is described as a method of detecting and quantifying the presence of a DNA sequence and is fully understood in the instructions provided by the manufacturer. Briefly, a FRET oligonucleotide probe is designed which overlaps the genomic flanking and insert DNA junction. The FRET probe and PCR primers (one primer in the insert DNA sequence and one in the flanking genomic sequence) are cycled in the presence of a thermostable polymerase and dNTPs. Hybridization of the FRET probe results in cleavage and release of the fluorescent moiety away from the quenching moiety on the FRET probe. A fluorescent signal indicates the presence of the flanking/transgene insert sequence due to successful amplification and hybridization.

Molecular Beacons have been described for use in sequence detection as described in Tyangi, *et al.* (Nature Biotech.14: 303-308, 1996). Briefly, a FRET oligonucleotide probe is designed that overlaps the flanking genomic and insert DNA junction. The unique structure of the FRET probe results in it containing secondary structure that keeps the fluorescent and quenching moieties in close proximity. The FRET probe and PCR primers (one primer in the insert DNA sequence and one in the flanking genomic sequence) are cycled in the presence of a thermostable polymerase and dNTPs. Following successful PCR amplification, hybridization of the FRET probe to the target sequence results in the removal of the probe secondary structure and spatial separation of the fluorescent and quenching moieties. A fluorescent signal results. The fluorescent signal indicates the presence of the flanking/transgene insert sequence due to successful amplification and hybridization, and is diagnostic for the corn event MON863 nucleic acid in a sample.

All of the above methods can be modified to determine the zygosity of a particular sample of nucleic acids derived from a single source. For example, a corn event MON863 plant which is homozygous for the event 863 allele contains within its genome two copies of the event 863 allele characteristic of and diagnostic for the corn event MON863 genome, and thus when selfed would breed true. Alternatively, a corn event MON863 homozygous plant can be crossed with another variety of corn, and the result of that cross would be plants that were heterozygous for the event MON863 allele. Methods are envisioned in which one skilled in the art could determine the zygosity of a particular plant with reference to the event MON863 allele.

For example, the use of three different primers in an amplification reaction with corn event MON863 DNA as a template, and in a separate and parallel amplification reaction with negative control corn DNA that is not MON863, i.e., that does not contain the inserted DNA present within MON863 DNA, would result in two different outcomes depending on the zygosity of the corn DNA containing the corn event MON863 DNA. Exemplary primers could be selected from the group consisting of SEQ ID NO:9, SEQ ID NO:10, and SEQ ID NO:12. Amplification of non-MON863 DNA with this group of primers would result in primer pair SEQ ID NO:10 and SEQ ID NO:12 producing a first amplicon corresponding to the contiguous corn genome sequence into which the PV-ZMIR13 sequence was inserted, that amplified sequence corresponding substantially to the linked combination of SEQ ID NO:5 and SEQ ID NO:6. This first amplicon would be expected in a plant that was heterozygous for the corn event MON863 allele, however, a heterozygote would also produce a second amplicon corresponding to SEQ ID NO:3 from the extension of the primer pair corresponding to SEQ ID NO:9 and SEQ ID NO:10. A corn plant containing DNA that was homozygous for the MON863 allele would only produce the second amplicon.

Similarly, a third amplicon would be produced from a thermal amplification reaction that used the primers SEQ ID NO:10, SEQ ID NO:11, and SEQ ID NO:12 with template DNA from a MON863 corn plant, this third amplicon corresponding to SEQ ID NO:4. This third amplicon would be the only amplicon produced using this particular combination of primers and template DNA if the plant was homozygous for the MON863 allele, however, heterozygote template DNA would result in the amplification of the first and the third amplicons, and non-MON863 template DNA would result in the amplification of only the first amplicon.

Herein, the inventors have determined as judged by molecular characterization that corn event MON863 contains a primary functional insert containing a significant portion of the transformation plasmid, PV-ZMIR13. This segment is detectable and diagnostic for the event MON863 nucleic acid sequences in a sample, in particular in plants that have been
5 selfed since the origination of the MON863 event.

There are many methods for transforming the Cry3Bb nucleic acid molecules into plant cells such as maize plant cells to produce a desired event such as MON863. Suitable methods are believed to include virtually any methods by which nucleic acid molecules may be introduced into the cells, such as by *Agrobacterium* infection or direct delivery of nucleic
10 acid molecules that may include PEG-mediated transformation, electroporation and acceleration of DNA coated particles, etc. (Pottkyus, Ann. Rev. Plant Physiol. Plant Mol. Biol. 42:205-225, 1991; Vasil, Plant Mol. Biol. 25: 925-937, 1994). For example, electroporation has been used to transform *Zea mays* protoplasts (Fromm et al., Nature 312:791-793, 1986). In general, the following are four most commonly used general methods
15 for delivering a gene into cells: (1) chemical methods (Graham and van der Eb, Virology, 54:536-539, 1973); (2) physical methods such as microinjection (Capecchi, Cell 22:479-488, 1980), electroporation (Wong and Neumann, Biochem. Biophys. Res. Commun. 107:584-587, 1982; Fromm et al., Proc. Natl. Acad. Sci. (USA) 82:5824-5828, 1985; U. S. Patent No. 5,384,253); and the gene gun (Johnston and Tang, Methods Cell Biol. 43:353-365, 1994); (3)
20 viral vectors (Clapp, Clin. Perinatol. 20:155-168, 1993; Lu et al., J. Exp. Med. 178:2089-2096, 1993; Eglitis and Anderson, Biotechniques 6:608-614, 1988); and (4) receptor-mediated mechanisms (Curiel et al., Hum. Gen. Ther. 3: 147-154, 1992; Wagner et al., Proc. Natl. Acad. Sci. (USA) 89: 6099-6103, 1992).

Transformation of plant protoplasts can be achieved using methods based on calcium
25 phosphate precipitation, polyethylene glycol treatment, electroporation, and combinations of these treatments. See for example (Potrykus et al., Mol. Gen. Genet., 205:193-200, 1986; Lorz et al., Mol. Gen. Genet., 199:178, 1985; Fromm et al., Nature, 319:791, 1986; Uchimiya et al., Mol. Gen. Genet.:204:204, 1986; Callis et al., Genes and Development, 1183, 1987; Marcotte et al., Nature, 335:454, 1988). Application of these systems to different plant
30 strains depends upon the ability to regenerate that particular plant strain from protoplasts. Among them are the methods for corn (U. S. Patent No. 5,569,834, U. S. Patent No. 5,416,011; McCabe et al., Biotechnology 6:923, 1988; Christou et al., Plant Physiol., 87:671-674, 1988). Illustrative methods for the regeneration of cereals from protoplasts are also

described (Fujimura et al., Plant Tissue Culture Letters, 2:74, 1985; Toriyama et al., Theor. Appl. Genet. 205:34, 1986; Yamada et al., Plant Cell Rep.4: 85, 1986; Abdullah et al., Biotechnology, 4:1087, 1986).

5 A transgenic plant such as a transgenic corn MON863 plant formed using transformation methods typically contains a single added Cry3Bb gene on one chromosome. Such a transgenic plant can be referred to as being heterozygous for the added Cry3Bb gene. More preferred is a transgenic plant that is homozygous for the added Cry3Bb gene; i.e., a transgenic plant that contains two added Cry3Bb genes, one gene at the same locus on each chromosome of a chromosome pair. A homozygous transgenic plant can be obtained by
10 sexually mating (selfing) an independent segregated transgenic plant that contains a single added Cry3Bb gene, germinating some of the seeds produced and analyzing the resulting plants produced for the Cry3Bb gene.

It is understood that two different transgenic plants can also be mated to produce offspring that contain two independently segregating added Cry3Bb genes. Selfing of
15 appropriate progeny can produce plants that are homozygous for both added Cry3Bb genes that encode Cry3Bb polypeptides. Backcrossing to a parental plant and out-crossing with a non-transgenic plant are also contemplated, as is vegetative propagation.

Specifically, a method for producing a corn plant that is resistant to coleopteran insect infestation may be conducted with the following steps: 1) sexually crossing a first corn plant
20 grown from the corn seed event MON863 comprising a DNA molecule selected from the group consisting of SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:4 and SEQ ID NO:20 that confers resistance to coleopteran insect infestation, and a second corn plant that lacks the resistance to coleopteran insect infestation, thereby producing a plurality of first progeny plants; 2) selecting a first progeny plant that is resistant to coleopteran insect
25 infestation; 3) selfing said first progeny plant, thereby producing a plurality of second progeny plants; and 4) selecting from said second progeny plants a plant resistant to coleopteran insect infestation. The first progeny plant that is resistant to coleopteran insect infestation or the second progeny plant that is resistant to coleopteran insect infestation may be backcrossed to the second corn plant or a third corn plant resulting in a corn plant that is resistant to
30 coleopteran insect damage infestation.

The regeneration, development, and cultivation of plants such as the MON863 plants from transformants or from various transformed explants are well known in the art (Weissbach and Weissbach, In: Methods for Plant Molecular Biology, Eds., Academic Press,

Inc. San Diego, CA, 1988). This regeneration and growth process may typically include the steps of selection of transformed cells containing exogenous Cry3Bb genes, culturing those individualized cells through the usual stages of embryonic development through the rooted plantlet stage. Transgenic embryos and seeds are similarly regenerated. The resulting
5 transgenic rooted shoots are thereafter planted in an appropriate plant growth medium such as soil.

The regeneration of plants containing the foreign, exogenous gene that encodes a protein of interest is well known in the art. As described in the present invention, the regenerated plants such as the regenerated MON863 plants that contain the Cry3Bb nucleic
10 acids, either wild type or chemically synthesized, that encode for the Cry3Bb proteins, may be preferably self-pollinated to provide homozygous transgenic maize plants, as discussed before. Otherwise, pollen obtained from the regenerated maize plants may be crossed to seed-grown plants of agronomically important lines. Conversely, pollen from plants of these important lines is used to pollinate regenerated plants. A transgenic MON863 plant of the
15 present invention may be cultivated using methods well known to one skilled in the art.

There are a variety of methods for the regeneration of plants from plant tissue. The particular method of regeneration will depend on the starting plant tissue and the particular plant species to be regenerated. Transformation of monocot plants using electroporation, particle bombardment, and *Agrobacterium* has also been reported. Transformation and plant
20 regeneration have been achieved in many monocot plants that include maize, asparagus, barley and wheat, etc. (Bytebier et al., Proc. Natl. Acad. Sci. USA 84:5345, 1987; Wan and Lemaux, Plant Physiol 104:37, 1994; Rhodes et al., Science 240: 204, 1988; Gordon-Kamm et al., Plant Cell, 2:603, 1990; Fromm et al., Bio/Technology 8:833, 1990; Armstrong et al., Crop Science 35:550-557, 1995; Vasil et al., Bio/Technology 10:667, 1992; U. S. Patent No.
25 5,631,152).

In addition to the above discussed procedures, practitioners are familiar with the standard resource materials which describe specific conditions and procedures for the construction, manipulation and isolation of macromolecules (e.g., DNA molecules, plasmids, etc.), generation of recombinant organisms and the screening and isolating of clones (see, for
30 example, Sambrook et al., Molecular Cloning: A Laboratory Manual, Cold Spring Harbor Press, 1989; Mailga et al., Methods in Plant Molecular Biology, Cold Spring Harbor Press, 1995; Birren et al., Genome Analysis: Analyzing DNA, 1, Cold Spring Harbor, New York, 1997).

DNA detection kits can be developed using the compositions disclosed herein and the methods well known in the art of DNA detection. The kits are useful for identification of corn event MON863 DNA in a sample and can be applied to methods for breeding corn plants containing the MON863 DNA. The kits contain one or more DNA sequences comprising at least 11 contiguous nucleotides homologous or complementary to sequences selected from the group consisting of SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:4, SEQ ID NO:5, SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO:8, SEQ ID NO:9, SEQ ID NO:10, SEQ ID NO:11, SEQ ID NO:12, SEQ ID NO:13, SEQ ID NO:14, SEQ ID NO:15, SEQ ID NO:16, SEQ ID NO:17, SEQ ID NO:18, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:21, and complements thereof. These DNA sequences can be used in DNA amplification reactions or as probes in a DNA hybridization method.

The following examples are included to demonstrate examples of certain preferred embodiments of the invention. It should be appreciated by those of skill in the art that the techniques disclosed in the examples that follow represent approaches the inventors have found function well in the practice of the invention, and thus can be considered to constitute examples of preferred modes for its practice. However, those of skill in the art should, in light of the present disclosure, appreciate that many changes can be made in the specific embodiments that are disclosed and still obtain a like or similar result without departing from the spirit and scope of the invention.

EXAMPLES

Example 1. Isolation and characterization of the DNA sequences flanking the MON863 insertion event

Corn event MON863 was generated through particle acceleration technology using a 4.7-Kb agarose gel-isolated *Mlu* I restriction fragment from the plasmid vector PV-ZMIR13 (pMON25097, Figure 1). The plant expression vector pMON25097 contains a first expression cassette comprising a non-naturally occurring CaMV35S AS4 promoter sequence (P-CaMV.AS4, SEQ ID NO:17) operably connected to a wheat chlorophyll A/B binding protein untranslated leader sequence (L-Ta.hcb1, SEQ ID NO:18) operably connected to a rice actin intron sequence (I-Os.Act1, SEQ ID NO:19) operably connected to a non-naturally occurring sequence encoding Cry3Bb variant protein (SEQ ID NO:20) operably connected to

a wheat heat shock Hsp17 transcription termination and polyadenylation sequence (T-Ta.Hsp17, SEQ ID NO:21). The plant expression vector pMON25097 contains a second expression cassette linked to the Cry3Bb expression cassette that confers paromomycin resistance to transformed plant tissue (i.e. the 3' end of the cry3Bb expression cassette is linked to the 5' end of the second expression cassette conferring paromomycin resistance). This resistance cassette consists of an enhanced CaMV35S promoter sequence (U.S. Patent No. 5,164,316) that is operably connected to a neomycin phosphotransferase coding sequence (U.S. Patent No. 5,569,834) that is operably connected to a nopaline synthase transcription termination and polyadenylation sequence (Fraley *et al.* Proc. Natl. Acad. Sci. USA 80:4803-4807, 1983). Transgenic corn plants resistant to paromomycin were derived essentially as described in U.S. Patent 5,424,412.

Molecular characterization of the insert in the corn event MON863 demonstrated that one copy of the DNA fragment used for transformation is present in the corn event MON863. In order to develop event-specific PCR identification methods, the sequences of corn DNA flanking the 5' and 3' ends of the insert in the corn event MON863 were determined using GenomeWalkerTM technology (Clontech Laboratories, Inc.) in accordance with the manufacturer's instructions. The GenomeWalkerTM method involves first completely digesting purified corn MON863 DNA with different restriction enzymes provided in the GenomeWalkerTM kit that leave blunt ends. Next, the purified blunt-ended genomic DNA fragments are ligated to GenomeWalkerTM Adaptors comprising known nucleic acid fragments. Each ligation is then amplified in a first PCR reaction using an outer adaptor primer, SEQ ID NO:22 (5'-GTAATACGACTCACTATAGGGC-3') provided by GenomeWalkerTM and an outer, gene-specific primer (SEQ ID NO:13, 5'-GAACGTCTTCTTTTCCACGATGCTCC-3', and SEQ ID NO:15, 5'-GCGAGTCTGATGAGACATCTCTGTAT-3', for the 5' and 3' ends of the transgene insert, respectively). The first PCR product mixture is then diluted and used as a template for a secondary or nested PCR with the nested adaptor primer, SEQ ID NO:23 (5'-ACTATAGGGCACGCGTGGT-3') provided by GenomeWalkerTM and a nested gene-specific primer (SEQ ID NO:14, 5'-TCGGCAGAGGCATCTTGAATGATAGC-3', and SEQ ID NO:16, 5'-AATTTGGTTGATGTGTGTGCGAGTTCT-3', for the 5' and 3' ends of the transgene insert, respectively). The secondary PCR product, which begins with the known gene-specific sequences and extends into the unknown adjacent genomic DNA, can then be sequenced using methods well known in the art. Once the flanking corn genomic

sequences were determined, PCR assays capable of detecting the presence of corn plant PV-ZMIR13 (MON863) DNA in a sample were developed.

Following this procedure, the nucleotide sequence as set forth in SEQ ID NO:5 was characterized as the corn genome sequence that is immediately adjacent to and upstream of the arbitrarily assigned 5' end of the pMON25097 DNA fragment that was inserted into the corn genome resulting in the construction and isolation of transgenic corn event MON863. One skilled in the art, or even one of ordinary skill in the art, would realize that additional nucleotide sequence information can readily be obtained that is even more distal from the junction sequence as set forth in SEQ ID NO:1 but still within the corn genome than the present 242 nucleotides exemplified herein in SEQ ID NO:5, and from nucleotide position 267 through nucleotide position 508 as set forth in SEQ ID NO:3. Also, the nucleotide sequence as set forth in SEQ ID NO:6 was characterized as the corn genome sequence that is immediately adjacent to and downstream of the arbitrarily assigned 3' end of the pMON25097 DNA fragment that was inserted into the corn genome resulting in the construction and isolation of transgenic corn event MON863. One skilled in the art will also realize that additional nucleotide sequence information can readily be obtained that is even more distal from the junction sequence as set forth in SEQ ID NO:2 but still within the corn genome than the present 224 nucleotides exemplified herein in SEQ ID NO:6, and from nucleotide position 361 through nucleotide position 584 as set forth in SEQ ID NO:4.

Example 2. Detection of the presence of MON863 DNA in a sample

The following provides a non-limiting example of the PCR assays developed to detect the presence of the MON863 DNA in a sample.

DNA was extracted from approximately 100 mg of ground grain tissue using Qiagen's Dneasy Plant Mini Kit (catalog # 68163, Valencia, CA) according to the manufacturer's recommended protocol with one exception. The grain used was processed prior to extraction in a -80°C freezer, and not ground under liquid nitrogen using a mortar and pestle immediately prior to extraction. DNA quantitation was conducted using methods well-known in the art, a Hoefer DNA Quant 200 Fluorometer, and Boehringer Mannheim (Indianapolis, IN) molecular size marker IX as a DNA calibration standard.

PCR analysis of the genomic DNA sequences flanking the 5' end of the insert in MON863 was performed using one primer (primer A) derived from the 5' genomic flanking sequence (SEQ ID NO:9, 5'-GTCTTGCGAAGGATAGTGGGAT-3') paired with a second

primer (primer B) located near the 5' end of the inserted DNA in the 35S promoter (SEQ ID NO:10, 5'-CATATGACATAAGCGCTCTTGG-3'), covering a 508-bp region. The PCR analysis for genomic DNA sequences flanking the 3' end of the MON863 insert was conducted using one primer (primer D) derived from the 3' genomic flanking sequence (SEQ ID NO:12, 5'-AGACTCTATGCTCTGCTCATAT-3') paired with a second primer (primer C) located in the tahsp17 polyadenylation sequence near the 3' end of the insert spanning a 584-bp region (SEQ ID NO:11, 5'-CTGATCATTGGTGCTGAGTCCTT-3') (Figure 2). The PCR analyses were conducted using 50 ng of the corn event MON863 genomic DNA or a MON846 non-transgenic genomic DNA template in a 50 μ L reaction volume containing a final concentration of 1.5 mM Mg^{2+} , 0.4 μ M of each primer, 200 μ M each dNTP, and 2.5 units of *Taq* DNA polymerase. The reactions were performed under the following cycling conditions: 1 cycle at 94°C for 3 minutes; 38 cycles of 94°C for 30 seconds, 60°C for 30 seconds, 72°C for 1.5 minutes; 1 cycle at 72°C for 10 minutes.

The PCR products (20 μ L) of the expected sizes representing the genomic sequence flanking the 5' and 3' ends of the insert were isolated by gel electrophoresis on a 2.0% agarose gel at 60 V for ~1 hour and visualized by ethidium bromide staining. The PCR fragments representing the 5' and 3' flanking sequences were excised from the gel and purified using the QIAquick Gel Extraction Kit (Qiagen, catalog # 28704) following the procedure supplied by the manufacturer. The purified PCR products were then sequenced with the initial PCR primers using dye-terminator chemistry.

The control reactions containing no template as well as the reactions containing non-transgenic corn DNA did not generate a PCR product with either primer set, as expected. PCR analysis of the corn rootworm event MON863 DNA generated the expected size products of 508 bp representing the 5' flanking sequence (SEQ ID NO:3) when using primers A and B having SEQ ID NOs: 9 and 10 and 584 bp representing the 3' flanking sequence (SEQ ID NO:4) when using primers D and C having SEQ ID NOs: 11 and 12.

Sequence data indicated that the 5' amplicon, i. e., SEQ ID NO:3, consisted of 266 bp of the 5' end of the 35S promoter at the 5' end of the insert followed by 242 bp of corn genomic flanking DNA. Sequence data indicated that the 3' amplicon, i.e., SEQ ID NO:4, consisted of 360 bp of the tahsp17 3' polyadenylation sequence which defines the 3' end of the insert, immediately followed by 224 bp of corn genomic flanking DNA.

Agronomically and commercially important products and/or compositions of matter including but not limited to animal feed, commodities, and corn products and by-products that are intended for use as food for human consumption or for use in compositions that are intended for human consumption including but not limited to corn flour, corn meal, corn syrup, corn oil, corn starch, popcorn, corn cakes, cereals containing corn and corn by-products, and the like are intended to be within the scope of the present invention if these products and compositions of matter contain detectable amounts of the nucleotide sequences set forth herein as being diagnostic for the corn event MON863.

Seed comprising the MON863 corn event have been deposited by the Applicant with American Type Culture Collection (ATCC), 10801 University Boulevard, Manassas, Virginia, USA ZIP 20110-2209 on October 17, 2000. The ATCC provided the Applicant with a deposit receipt, assigning the ATCC Deposit Accession No. PTA-2605 to the corn *Zea mays* event MON863 PV-ZMIR13.

Those of skill in the art, in light of these examples, should appreciate that many changes can be made to the foregoing assays to detect DNA derived from corn event MON863 in a sample. For example, a primer set comprising one primer complementary to corn genome DNA and another primer complementary to sequences within the insert are envisioned. Furthermore, any of various hybridization assays described earlier using DNA probes complementary to the novel nucleic acid sequences located at transgene/genome junctions are envisioned as well.

Having illustrated and described the principles of the present invention, it should be apparent to persons skilled in the art that the invention can be modified in arrangement and detail without departing from such principles. We claim all modifications that are within the spirit and scope of the appended claims.

All publications and published patent documents cited in this specification are incorporated herein by reference to the same extent as if each individual publication or patent application was specifically and individually indicated to be incorporated by reference.

CLAIMS

What is claimed is:

1. An isolated DNA molecule comprising a nucleotide sequence as set forth in SEQ ID NO:1 or the complement thereof.
2. An isolated DNA molecule comprising a nucleotide sequence as set forth in SEQ ID NO:2 or the complement thereof.
3. An isolated DNA molecule comprising at least one junction nucleotide sequence of corn event MON863 selected from the group consisting of SEQ ID NO:1, SEQ ID NO:2, and complements thereof.
4. An isolated nucleic acid linking a heterologous DNA molecule to the corn plant genome in corn event MON863 comprising a sequence of from about 11 to about 20 consecutive nucleotides selected from the group consisting of SEQ ID NO:1, SEQ ID NO:2, and the complements thereof.
5. An isolated nucleotide primer sequence comprising at least from about 11 to about 41 contiguous nucleotides as set forth in SEQ ID NO:3 or the complement thereof, from about nucleotide position 247 through about nucleotide position 287.
6. An isolated nucleotide primer sequence comprising at least from about 11 to about 40 contiguous nucleotides as set forth in SEQ ID NO:4 or the complement thereof, from about nucleotide position 341 through about nucleotide position 380.
7. A first polynucleotide primer sequence and a second polynucleotide primer sequence which function together in the presence of a corn event MON863 DNA template in a sample to produce an amplicon diagnostic for the corn event MON863, said first and second polynucleotide primer sequences being selected from the group consisting of SEQ ID NO:5, SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO:8, SEQ ID NO:9, SEQ ID NO:10, SEQ ID NO:11, and SEQ ID NO:12, and the complements thereof.

8. The first and second polynucleotide primers of claim 7 wherein said first polynucleotide primer sequence comprises the sequence as set forth in SEQ ID NO:9 and said second polynucleotide primer sequence comprises the reverse complement of the sequence as set forth in SEQ ID NO:10, and wherein said amplicon comprises the sequence substantially as set forth in SEQ ID NO:3.

9. The first and second polynucleotide primers of claim 7 wherein said first polynucleotide primer sequence comprises the reverse complement of the sequence as set forth in SEQ ID NO:12 and said second polynucleotide primer sequence comprises the sequence as set forth in SEQ ID NO:11, and wherein said amplicon comprises the sequence substantially as set forth in SEQ ID NO:4.

10. The first and second polynucleotide primer sequences of claim 8 wherein said first polynucleotide primer sequence is or is complementary to a corn plant genome DNA flanking the point of insertion of a heterologous DNA sequence inserted into the corn plant genome of corn event MON863, and said second polynucleotide primer sequence is or complementary to the heterologous DNA sequence inserted into the corn plant genome of the corn event MON863, and wherein said amplicon is diagnostic for the corn plant event MON863.

11. A corn plant, wherein at least one ancestor of said corn plant is the corn event MON863 comprising a DNA molecule selected from the group consisting of SEQ ID NO:1, SEQ ID NO:2, and the complements thereof.

12. A corn plant comprising at least a first and a second DNA sequence linked together to form a contiguous nucleotide sequence, wherein said first DNA sequence is within a junction sequence and comprises at least about 11 contiguous nucleotides selected from the group consisting of

- (a) nucleotide position 247-287 as set forth in SEQ ID NO:3;
- (b) nucleotide position 341-380 as set forth in SEQ ID NO:4;
- (c) SEQ ID NO:5;
- (d) SEQ ID NO:6; and
- (e) the complement thereof;

wherein said second DNA sequence is within the transgene insert DNA sequence, said transgene insert DNA sequence being selected from the group consisting of SEQ ID NO:17, SEQ ID NO:18, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:21, and the complement thereof; and

wherein said first and said second DNA sequences are useful as nucleotide primers or probes for detecting the presence of corn event MON863 nucleic acid sequences in a biological sample.

13. The corn plant of claim 12 wherein the nucleotide primers are used in a DNA amplification method to amplify a target DNA sequence from template DNA extracted from said corn plant and said corn plant is identifiable from other corn plants by the production of an amplicon corresponding to a DNA sequence comprising SEQ ID NO:1 or SEQ ID NO:2.

14. A nucleic acid detection kit for use in identifying the presence of nucleic acids of the corn event MON863 in a biological sample comprising:

- a) a probe which is or is complementary to part of a transgene DNA sequence present in the genome of the corn event MON863, said probe comprising at least about 11 consecutive nucleotides, said consecutive nucleotides being selected from the group consisting of SEQ ID NO:1, SEQ ID NO:2, and complements thereof;
- b) reagents necessary for detecting the binding of said probe to said transgene DNA sequence; and
- c) instructions for use; packaged together in said kit.

15. A method of detecting the presence of corn event MON863 DNA in a biological sample, comprising the steps of:

- a) contacting said sample with a first polynucleotide primer sequence and a second polynucleotide primer sequence that function together in a nucleic acid amplification reaction the presence of a DNA template from corn event MON863 to produce an amplicon diagnostic for said corn event;
- b) performing a nucleic acid amplification reaction, thereby producing said amplicon; and
- c) detecting said amplicon.

16. The method of claim 15 wherein said amplicon comprises a nucleotide sequence selected from the group consisting of SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:4, and the complements thereof.

17. The method of claim 16 wherein said amplicon comprises SEQ ID NO:1, wherein said first polynucleotide primer sequence is selected from the group consisting of the SEQ ID NO:1 from about nucleotide position 1 through about nucleotide position 20, SEQ ID NO:3 from about nucleotide position 1 through about nucleotide position 267, and SEQ ID NO:9 from about nucleotide position 1 through about nucleotide position 22, and wherein said second polynucleotide primer sequence is selected from the group consisting of a sequence complementary to SEQ ID NO:1 from about nucleotide position 9 through about nucleotide position 20, a sequence complementary to SEQ ID NO:3 from about nucleotide position 266 through about nucleotide position 508, and a sequence complementary to SEQ ID NO:10 from about nucleotide position 1 through about nucleotide position 22.

18. The method of claim 16 wherein said amplicon comprises SEQ ID NO:2, wherein said first polynucleotide primer sequence is selected from the group consisting of the SEQ ID NO:2 from about nucleotide position 1 through about nucleotide position 20, SEQ ID NO:4 from about nucleotide position 1 through about nucleotide position 361, and SEQ ID NO:11 from about nucleotide position 1 through about nucleotide position 23, and wherein said second polynucleotide primer sequence is selected from the group consisting of a sequence complementary to SEQ ID NO:2 from about nucleotide position 9 through about nucleotide position 20, a sequence complementary to SEQ ID NO:4 from about nucleotide position 360 through about nucleotide position 584, and a sequence complementary to SEQ ID NO:12 from about nucleotide position 1 through about nucleotide position 22.

19. The method of claim 17 or 18 wherein said amplicon comprises a nucleotide sequence comprising at least 20 consecutive nucleotides selected from the group consisting of SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3, and SEQ ID NO:4.

20. A method of detecting corn event MON863 DNA in a biological sample, comprising the steps of:

- a) contacting a sample suspected of containing said DNA with a polynucleotide probe that hybridizes under stringent hybridization conditions with said DNA and that does not hybridize under stringent hybridization conditions with DNA from a control corn plant other than corn event MON863;
- b) subjecting said sample and said probe to said stringent hybridization conditions; and
- c) detecting the hybridization of said probe to the corn event MON863 DNA.

21. A biological sample derived from a corn event MON863 plant, tissue, or seed, wherein said sample comprises a nucleotide sequence which is or is complementary to a sequence selected from the group consisting of SEQ ID NO:1, and SEQ ID NO:2, and wherein said sequence is detectable in said sample using a nucleic acid amplification or nucleic acid hybridization method.

22. The biological sample of claim 21 comprising plant, tissue, or seed of transgenic corn event MON863 having seed deposited with American Type Culture Collection (ATCC) with Accession No. PTO-2506.

23. The biological sample of claim 22 wherein said sample is selected from the group consisting of an extract obtainable from the transgenic corn plant event MON863, and wherein said extract comprises one or more of the nucleotide sequences selected from the group consisting of SEQ ID NO:1, SEQ ID NO:2, and the complement thereof.

24. The biological sample of claim 23 wherein said sample is selected from the group consisting of corn flour, corn meal, corn syrup, corn oil, corn starch, and cereals manufactured in whole or in part to contain corn by-products.

25. An extract derived from a corn even MON863 plant, tissue, or seed comprising a nucleotide sequence which is or is complementary to a nucleotide sequence selected from the group consisting of SEQ ID NO:1, and SEQ ID NO:2.

26. The extract of claim 25 wherein said sequence is detectable in said extract using a nucleic acid amplification or nucleic acid hybridization method.

27. The extract of claim 26 comprising plant, tissue, or seed of transgenic corn plant event MON863.

28. The extract of claim 27 wherein said sample is selected from the group consisting of corn flour, corn meal, corn syrup, corn oil, corn starch, and cereals manufactured in whole or in part to contain corn by-products.

29. A corn event MON 863 having seed deposited with American Type Culture Collection (ATCC) with Accession No.PTA-2506.

30. The corn event of claim 29, wherein the genome of said event or progeny thereof comprises a DNA molecule selected from the group consisting of SEQ ID NO:1 and SEQ ID NO:2.

31. Plant parts of the corn event of claim 30.

32. An isolated DNA molecule, wherein said DNA molecule is diagnostic for the presence of DNA from the corn event MON863, and wherein said DNA is selected from the group consisting of SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:4, and the complement thereof.

33. A nucleotide sequence comprising a DNA sequence selected from the group consisting of SEQ ID NO:3, and SEQ ID NO:4, wherein said DNA sequence is used as the template in a DNA amplification method in which an amplicon is produced that is diagnostic for corn event MON863 DNA in a sample.

34. The nucleotide sequence of claim 33, wherein said amplicon comprises SEQ ID NO:1.

35. The nucleotide sequence of claim 33 wherein said amplicon comprises SEQ ID NO:2.

36. An isolated DNA polynucleotide primer molecule comprising at least 11 contiguous nucleotides of SEQ ID NO:3 from about nucleotide position 247 through about nucleotide

position 287, or the complement thereof, for use in detecting the presence of corn event MON863 DNA in a biological sample.

37. An isolated DNA polynucleotide primer molecule comprising at least 11 contiguous nucleotides of SEQ ID NO:4 from about nucleotide position 348 through about nucleotide position 380, or the complement thereof, for use in detecting the presence of corn event MON863 DNA in a biological sample.

38. A kit for detecting the presence of corn event MON863 DNA in a biological sample comprising a first probe molecule consisting of at least about 11 contiguous nucleotides homologous or complementary to a nucleotide sequence selected from the group consisting of SEQ ID NO:3 from about nucleotide position 247 through about nucleotide position 287 and a second probe molecule consisting of at least about 11 contiguous nucleotides homologous or complementary to a nucleotide sequence selected from the group consisting of SEQ ID NO:4 from about nucleotide position 341 through about nucleotide position 380, wherein said molecule hybridizes specifically to said nucleotide sequence under stringent hybridization conditions.

39. A method of producing a corn plant resistant to coleopteran insect infestation comprising:

- (a) sexually crossing a first parent corn plant comprising corn event MON863 DNA and a second parent corn plant that lacks said DNA, thereby producing a plurality of first progeny plants; and
- (b) selecting a first progeny plant that is resistant to coleopteran insect infestation; and
- (c) selfing said first progeny plant, thereby producing a plurality of second progeny plants; and
- (d) selecting from said second progeny plants, a plant that is resistant to coleopteran insect infestation;

wherein said second progeny plants comprise a nucleotide sequence selected from the group consisting of SEQ ID NO:1 and SEQ ID NO:2.

40. A method of detecting the presence of corn event MON863 DNA in a biological sample, the method comprising:

- (a) contacting said sample with a primer pair, which when used in a nucleic acid amplification reaction with corn event MON863 DNA produces an amplicon diagnostic for corn event MON863 DNA; and
- (b) performing a nucleic acid amplification reaction, thereby producing said amplicon; and
- (c) detecting said amplicon.

41. A method of detecting the presence of corn event MON863 DNA in a sample, the method comprising:

- (a) contacting the sample with a probe that
 - (i) hybridizes under stringent hybridization conditions with corn event MON863 DNA, and
 - (ii) does not hybridize under the stringent hybridization conditions with non-corn event MON863 DNA,wherein said probe comprises a sequence that is complementary to an at least 11 base sequence that is selected from the group consisting of SEQ ID NO:1 and SEQ ID NO:2;
- (b) subjecting said sample and probe to stringent hybridization conditions; and
- (c) detecting hybridization of said probe to said MON863 DNA.

42. A method of determining the zygosity of a plant comprising corn event MON863 DNA, said method comprising:

- (a) contacting a sample comprising said DNA with a first primer pair comprising SEQ ID NO:9 and SEQ ID NO:10, that when used in a first nucleic-acid amplification reaction with corn event MON863 DNA, produces a first amplicon that is diagnostic for corn event MON863;
- (b) performing said first nucleic acid amplification reaction, thereby producing said first amplicon;
- (c) detecting said first amplicon;
- (d) contacting said sample comprising corn DNA with a second primer pair, that when used in a second nucleic-acid amplification reaction with genomic DNA other than event MON863 DNA, produces a second amplicon comprising native corn genomic DNA,

wherein said second primer pair comprises a first primer comprising at least 15 contiguous nucleotides selected from the group of nucleotides set forth in SEQ ID NO:3 from about nucleotide position 267 through about nucleotide 508 and a second primer comprising at least 15 contiguous nucleotides selected from the group of nucleotides complementary to SEQ ID NO:4 from about nucleotide position 361 through about nucleotide position 584;

(e) performing said second nucleic acid amplification reaction, thereby producing said second amplicon;

(f) detecting said second amplicon; and

(g) comparing said first and said second amplicon in a sample,
wherein the zygosity of said plant is determined.

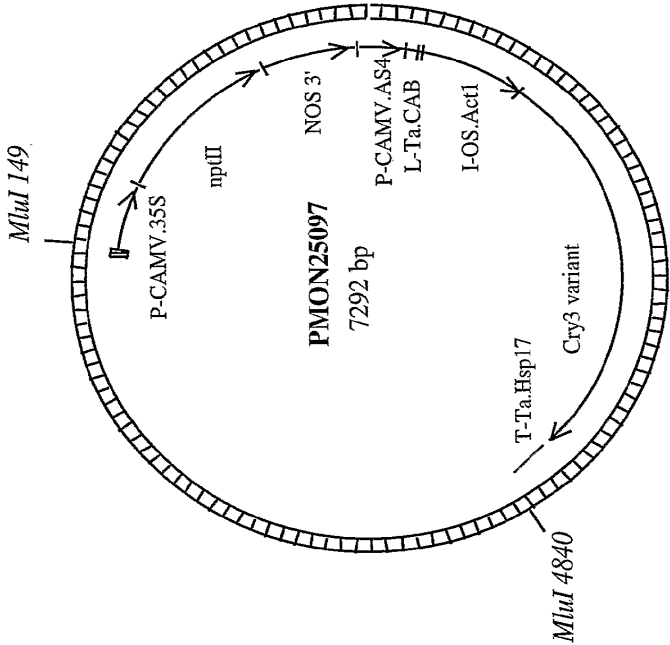


Figure 1

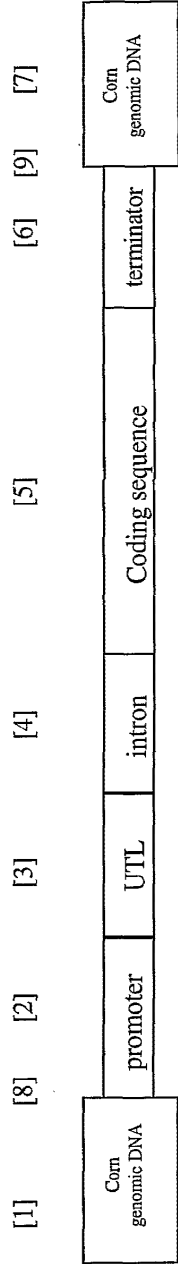


Figure 2

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Johnson, Scott C.

Cavato, Tracey A.

Coombe, Timothy R.

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DETECTION THEREOF

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52221 PCT Application Seq Listing.ST25.txt

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52221 PCT Application Seq Listing.ST25.txt

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52221 PCT Application Seq Listing.ST25.txt

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52221 PCT Application Seq Listing.ST25.txt

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52221 PCT Application Seq Listing.ST25.txt

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52221 PCT Application Seq Listing.ST25.txt

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Page 11

52221 PCT Application Seq Listing.ST25.txt

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PCT

38-21(52221)

Original (for SUBMISSION) - printed on 22.07.2003 01:07:03 PM

0-1	Form - PCT/RO/134 (EASY) Indications Relating to Deposited Microorganism(s) or Other Biological Material (PCT Rule 13bis)	
0-1-1	Prepared using	PCT-EASY Version 2.92 (updated 01.01.2003)
0-2	International Application No.	
0-3	Applicant's or agent's file reference	38-21(52221)
1	The indications made below relate to the deposited microorganism(s) or other biological material referred to in the description on:	
1-1	page	24
1-2	line	10-14
1-3	Identification of Deposit	
1-3-1	Name of depositary institution	American Type Culture Collection
1-3-2	Address of depositary institution	10801 University Blvd., Manassas, Virginia 20110-2209 United States of America
1-3-3	Date of deposit	17 October 2000 (17.10.2000)
1-3-4	Accession Number	ATCC PTA-2605
1-4	Additional Indications	NONE
1-5	Designated States for Which Indications are Made	all designated States
1-6	Separate Furnishing of Indications These indications will be submitted to the International Bureau later	NONE

FOR RECEIVING OFFICE USE ONLY

0-4	This form was received with the international application: (yes or no)	YES
0-4-1	Authorized officer	SIGFRIED R. HOSTAD RO/US

FOR INTERNATIONAL BUREAU USE ONLY

0-5	This form was received by the International Bureau on:	
0-5-1	Authorized officer	

Electronic Acknowledgement Receipt	
EFS ID:	13958789
Application Number:	12907488
International Application Number:	
Confirmation Number:	2088
Title of Invention:	CORN EVENT DAS-59122-7 AND METHODS FOR DETECTION THEREOF
First Named Inventor/Applicant Name:	JAMES WAYNE BING
Customer Number:	29122
Filer:	David Michael Saravitz
Filer Authorized By:	
Attorney Docket Number:	035718/387563
Receipt Date:	11-OCT-2012
Filing Date:	19-OCT-2010
Time Stamp:	11:17:47
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	387563-SupplDS.pdf	104306 56e62321248d5fa769f4d5758d46ad1c648c93c1	no	1

Warnings:

Information:

2	Information Disclosure Statement (IDS) Form (SB08)	387563-PTO1449.pdf	110680	no	1
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Information:					
Total Files Size (in bytes):			2692289		
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. <u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.					

Attorney's Docket No. 035718/387563

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re:	Bing <i>et al.</i>	Confirmation No.:	2088
Appl. No.:	12/907,488	Art Unit:	1638
Filed:	October 19, 2010	Examiner:	Anne R. Kubelik
For:	CORN EVENT DAS-59122-7 AND METHODS FOR DETECTION THEREOF		

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

**SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT
CITATION UNDER 37 C.F.R. § 1.97**

Sir:

Attached is a list of documents on form PTO-1449 along with a copy of any cited foreign patent documents and non-patent literature documents in accordance with 37 CFR 1.98(a)(2).

It is requested that the Examiner consider these documents and officially make them of record in accordance with the provisions of 37 C.F.R. § 1.97 and Section 609 of the MPEP. By identifying the listed documents, Applicant in no way makes any admission as to the prior art status of the listed documents, but is instead identifying the listed documents for the sake of full disclosure.

Respectfully submitted,

/denise m. ray/

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/907,488	10/19/2010	JAMES WAYNE BING	035718/387563	2088

29122	7590	01/18/2013
ALSTON & BIRD LLP PIONEER HI-BRED INTERNATIONAL, INC. BANK OF AMERICA PLAZA 101 SOUTH TRYON STREET, SUITE 4000 CHARLOTTE, NC 28280-4000		

EXAMINER	
KUBELIK, ANNE R	

ART UNIT	PAPER NUMBER
1638	

NOTIFICATION DATE	DELIVERY MODE
01/18/2013	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

usptomail@alston.com

Office Action Summary	Application No. 12/907,488		Applicant(s) BING ET AL.	
	Examiner ANNE KUBELIK		Art Unit 1638	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☐ Responsive to communication(s) filed on ____.

2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.

3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.

4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

5) ☒ Claim(s) 1-9 is/are pending in the application.
5a) Of the above claim(s) ____ is/are withdrawn from consideration.

6) ☒ Claim(s) 1 is/are allowed.

7) ☒ Claim(s) 2-9 is/are rejected.

8) ☐ Claim(s) ____ is/are objected to.

9) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10) ☐ The specification is objected to by the Examiner.

11) ☒ The drawing(s) filed on 19 October 2010 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date ____.

3) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.

4) ☐ Other: ____.

DETAILED ACTION

1. Claims 1-9 are pending.

Claim Rejections - 35 USC § 112

The following is a quotation of 35 U.S.C. 112(a):

(a) IN GENERAL.—The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor or joint inventor of carrying out the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), first paragraph:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 2-8 are rejected under 35 U.S.C. 112(a) or 35 U.S.C. 112 (pre-AIA), first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The claims are broadly drawn to insect resistant plants comprising SEQ ID NO:33 or 35.

SEQ ID NO:33 or 35 are not sufficient to confer insect resistance to plants, as they do not encode insect resistance genes.

The only insect resistant corn plants taught in the specification are DAS-59122-7 event plants. This embodiment could be enabled if there were a repeatable process to obtain the exact same seed in each occurrence.

The specification does not teach a repeatable process to obtain the exact same seed in each occurrence. DAS-59122-7 event seed must be obtainable by a repeatable method set forth in the specification or otherwise be readily available to the public. If a seed is not so obtainable or available, a deposit thereof may satisfy the requirements of 35 U.S.C. 112. It is not apparent if such a seed is readily available to the public.

If the deposit of these seeds is made under the terms of the Budapest Treaty, then an affidavit or declaration by the Applicant, or a statement by an attorney of record over his or her signature and registration number, stating that the seeds will be irrevocably and without restriction or condition released to the public upon the issuance of a patent would satisfy the deposit requirement made herein. A minimum deposit of 2500 seeds is considered sufficient in the ordinary case to assure availability through the period for which a deposit must be maintained.

If the deposit has not been made under the Budapest Treaty, then in order to certify that the deposit, meets the criteria set forth in 37 CFR 1.801-1.809, Applicant may provide assurance of compliance by an affidavit or declaration, or by a statement by an attorney of record over his or her signature and registration number showing that

(a) during the pendency of the application, access to the invention will be afforded to the Commissioner upon request;

(b) all restrictions upon availability to the public will be irrevocably removed upon granting of the patent;

(c) the deposit will be maintained in a public depository for a period of 30 years or 5 years after the last request or for the enforceable life of the patent, whichever is longer;

(d) the viability of the biological material at the time of deposit will be tested (see 37 CFR 1.807); and

(e) the deposit will be replaced if it should ever become inviable.

In addition, the identifying information set forth in 37 CFR 1.809(d) should be added to the specification. See 37 CFR 1.801 - 1.809 [MPEP 2401-2411.05] for additional explanation of these requirements.

Deposit of DAS-59122-7 event seed would not enable one of skill in the art to make the full scope of insect resistant plants comprising SEQ ID NO:33 or 35, as SEQ ID NO:33 or 35 are not sufficient to confer insect resistance to plants.

Deposit of DAS-59122-7 is also required to enable the method of claim 8, as event DAS-59122-7 could not be detected in seed unless event DAS-59122-7 were enabled.

3. Claim 9 is rejected under 35 U.S.C. 112(a) or 35 U.S.C. 112 (pre-AIA), first paragraph, as failing to comply with written description requirement. The claim(s) contains subject matter that was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The claim is drawn to a nucleic acid that comprises 11 base pairs of SEQ ID NO:33 or 35 and that uniquely identifies event DAS-59122-7 under stringent hybridization.

The specification describes no 11 base pair long nucleic acids that uniquely identifies event DAS-59122-7 under stringent hybridization.

The structural features that 11 base pair long fragments of SEQ ID NO:32 that comprise the junction site and that uniquely identify event DAS-59122-7 under stringent hybridization from other 11 base pair long fragments of SEQ ID NO:32 that comprise the junction site are not described in the specification.

One of skill in the art would not recognize that Applicant was in possession of the necessary common attributes or features of the genus in view of the lack of a disclosed species.

Hence, Applicant has not, in fact, described the claimed nucleic acids, and the specification fails to provide an adequate written description of the claimed invention.

Therefore, given the lack of written description in the specification with regard to the structural and functional characteristics of the claimed compositions, Applicant does not appear to have been in possession of the claimed genus at the time this application was filed.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claim 9 is rejected under 35 U.S.C. 102(b) as being anticipated by Whitelaw et al (2003, GenBank Accession No. CG069192).

Whitelaw et al teaches a nucleic acids that would hybridize to at least 11 contiguous nucleotides of SEQ ID NO:33 or 35.

Aligned to SEQ ID NO:33:

Art Unit: 1638

CG069192
 LOCUS CG069192 865 bp DNA linear GSS 19-AUG-2003
 DEFINITION PUFTW67TB ZM_0.6_1.0_KB Zea mays genomic clone ZMMBTa0732K13,
 genomic survey sequence.
 ACCESSION CG069192
 VERSION CG069192.1 GI:33941372
 KEYWORDS GSS.
 SOURCE Zea mays
 ORGANISM Zea mays
 Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta;
 Spermatophyta; Magnoliophyta; Liliopsida; Poales; Poaceae; PACMAD
 clade; Panicoideae; Andropogoneae; Zea.
 REFERENCE 1 (bases 1 to 865)
 AUTHORS Whitelaw,C.A., Quackenbush,J., Van Aken,S., Utterback,T.,
 Resnick,A., Fraser,C.M., Yuan,Y., San Miguel,P., Ma,J. and
 Bennetzen,J.
 TITLE Maize Genomics Consortium
 JOURNAL Unpublished (2003)
 COMMENT Other_GSSs: PUFTW67TD
 Contact: Cathy Whitelaw
 TIGR
 9712 Medical Center Drive, Rockville, MD 20850, USA
 Tel: 301-838-5843
 Fax: 301-838-0208
 Email: whitelaw@tigr.org
 Seq primer: TR
 Class: sheared ends.
 FEATURES Location/Qualifiers
 source 1..865
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 /note="Vector: PCR4-TOPO; Site_1: EcoRI; 0.6-1.0 kb high
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 Best Local Similarity 100.0%;
 Matches 440; Conservative 0; Mismatches 0; Indels 0; Gaps 0;
 Qy 108 TTCCCTTCTATGGTCCCGTTTGTATTATCCTCTAAATTATATAATCCAGCTTAAATAAGTT 167
 ||
 Db 335 TTCCCTTCTATGGTCCCGTTTGTATTATCCTCTAAATTATATAATCCAGCTTAAATAAGTT 394
 Qy 168 AAGAGACAAACAAACACACAGATTATTAAATAGATTATGTAATCTAGATACCTAGATTA 227
 ||
 Db 395 AAGAGACAAACAAACACACAGATTATTAAATAGATTATGTAATCTAGATACCTAGATTA 454
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 Db 455 TGTAATCCATAAGTAGAATATCAGGTGCTTATATAATCTATGAGCTCGATTATATAATCT 514
 Qy 288 TAAAGAAAACAAACAGAGCCCTATATAAAGGGGTCAAGTGGACACTTGGTCACTCATT 347
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 Db 515 TAAAGAAAACAAACAGAGCCCTATATAAAGGGGTCAAGTGGACACTTGGTCACTCATT 574
 Qy 348 TAATCCCTCCCTCTCCTCTTTTATCCCTCTTTTGGTGTATTCACCAATAGTGGTGTGCA 407
 ||
 Db 575 TAATCCCTCCCTCTCCTCTTTTATCCCTCTTTTGGTGTATTCACCAATAGTGGTGTGCA 634
 Qy 408 CCGTGATTGGCTCGTAAAAATTCTTGGACGGATGGAAGAGTGAAGAGATAAGCAAGTCA 467
 ||
 Db 635 CCGTGATTGGCTCGTAAAAATTCTTGGACGGATGGAAGAGTGAAGAGATAAGCAAGTCA 694

Art Unit: 1638

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Qy      468 AAGAAAAGTAACAACGAAGCTTCATCAGCTACAAATTTTGGCCCAACTGGTTCACACCAGC 527
          |||
Db      695 AAGAAAAGTAACAACGAAGCTTCATCAGCTACAAATTTTGGCCCAACTGGTTCACACCAGC 754

Qy      528 ACCAAACTTACGTATACATG 547
          |||
Db      755 ACCAAACTTACGTATACATG 774

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Aligned to SEQ ID NO:35:

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CG069192
LOCUS      CG069192                865 bp    DNA        linear    GSS 19-AUG-2003
DEFINITION PUFTW67TB ZM_0.6_1.0_KB Zea mays genomic clone ZMMBTa0732K13,
            genomic survey sequence.
ACCESSION  CG069192
VERSION    CG069192.1  GI:33941372
KEYWORDS   GSS.
SOURCE     Zea mays
            ORGANISM Zea mays
            Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta;
            Spermatophyta; Magnoliophyta; Liliopsida; Poales; Poaceae; PACMAD
            clade; Panicoideae; Andropogoneae; Zea.
REFERENCE  1 (bases 1 to 865)
AUTHORS    Whitelaw,C.A., Quackenbush,J., Van Aken,S., Utterback,T.,
            Resnick,A., Fraser,C.M., Yuan,Y., San Miguel,P., Ma,J. and
            Bennetzen,J.
TITLE      Maize Genomics Consortium
JOURNAL    Unpublished (2003)
COMMENT    Other_GSSs: PUFTW67TD
            Contact: Cathy Whitelaw
            TIGR
            9712 Medical Center Drive, Rockville, MD 20850, USA
            Tel: 301-838-5843
            Fax: 301-838-0208
            Email: whitelaw@tigr.org
            Seq primer: TR
            Class: sheared ends.
FEATURES   Location/Qualifiers
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                                   /clone="ZMMBTa0732K13"
                                   /clone_lib="LIBGSS_007481 ZM_0.6_1.0_KB"
                                   /note="Vector: pCR4-TOPO; Site_1: EcoRI; 0.6-1.0 kb high
                                   CoT selected genomic DNA library"

Query Match      58.4%;  Score 440;  DB 157;  Length 865;
Best Local Similarity  100.0%;
Matches  440;  Conservative  0;  Mismatches  0;  Indels  0;  Gaps  0;

Qy      315 TTCCCTTCTATGGTCCGTTTGTGTTATCCTCTAAATTATATAATCCAGCTTAAATAAGTT 374
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Db      395 AAGAGACAAACAAACACACAGATTATTAATAGATTATGTAATCTAGATACCTAGATTA 454

Qy      435 TGTAATCCATAAGTAGAATATCAGGTGCTTATATAATCTATGAGCTCGATTATATAATCT 494
          |||
Db      455 TGTAATCCATAAGTAGAATATCAGGTGCTTATATAATCTATGAGCTCGATTATATAATCT 514

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Art Unit: 1638

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Qy      495 TAAAAGAAAACAAACAGAGCCCCCTATAAAAAGGGGTCAAGTGGACACTTGGTCACTCATT 554
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Qy      555 TAATCCCTCCCTCTCCTCTTTTATCCCTCTTTTGGTGTATTACCAATAGTGGTGTGCA 614
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Db      575 TAATCCCTCCCTCTCCTCTTTTATCCCTCTTTTGGTGTATTACCAATAGTGGTGTGCA 634

Qy      615 CCTGTGATTGGCTCGTAAAAATTCTTGGACGGATGGAAGAGTGAAGAGATAAGCAAGTCA 674
          |||
Db      635 CCTGTGATTGGCTCGTAAAAATTCTTGGACGGATGGAAGAGTGAAGAGATAAGCAAGTCA 694

Qy      675 AAGAAAAGTAACAACGAAGCTTCATCAGCTACAAATTTTGGCCCACTGGTTGCACCAGC 734
          |||
Db      695 AAGAAAAGTAACAACGAAGCTTCATCAGCTACAAATTTTGGCCCACTGGTTGCACCAGC 754

Qy      735 ACCAACTTACGTATACATG 754
          |||
Db      755 ACCAACTTACGTATACATG 774

```

5. Claims 1-8 are free of the art, given the failure of the prior art to teach or suggest SEQ ID NO:33 or 35, a plant comprising them, a method of breeding the plant, or a method of detecting the sequences in corn tissue.

6. Claim 1 is allowed.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anne R. Kubelik, Ph.D., whose telephone number is (571) 272-0801. The examiner can normally be reached Monday through Friday, 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anne Marie Grunberg, can be reached at (571) 272-0975.

The central fax number for official correspondence is (571) 273-8300.

Patent applicants with problems or questions regarding electronic images that can be viewed in the Patent Application Information Retrieval system (PAIR) can now contact the USPTO's Patent Electronic Business Center (Patent EBC) for assistance. Representatives are available to answer your questions daily from 6 am to midnight (EST). The toll free number is (866) 217-9197. When calling please have your application serial or patent number, the type of document you are having an image problem with, the number of pages and the specific nature of the problem. The Patent Electronic Business Center will notify applicants of the resolution of the problem within 5-7 business days. Applicants can also check PAIR to confirm that the problem has been corrected. The USPTO's Patent Electronic Business Center is a complete service center supporting all patent business on the Internet. The USPTO's PAIR system provides Internet-based access to patent application status and history information. It also

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Art Unit: 1638

enables applicants to view the scanned images of their own application file folder(s) as well as general patent information available to the public.

For all other customer support, please call the USPTO Call Center (UCC) at 800-786-9199.

/Anne R Kubelik/

Primary Examiner, Art Unit 1638

Notice of References Cited	Application/Control No. 12/907,488	Applicant(s)/Patent Under Reexamination BING ET AL.	
	Examiner ANNE KUBELIK	Art Unit 1638	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
	A	US-			
	B	US-			
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	Whitelaw et al (2003, GenBank Accession No. CG069192)
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Receipt date: 10/19/2010

12907488 - GAU: 1638

Substitute for form 1449/PTO (Revised 07/2007) INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Use as many sheets as necessary)</i>				Complete if Known	
				Application Number	To be assigned
				Filing Date	Concurrently herewith
				First Named Inventor	James Wayne Bing
				Art Unit	To be assigned
Examiner Name	To be assigned				
Sheet	1	of	2	Attorney Docket Number	035718/387563

US PATENT DOCUMENTS						
Examiner Initials*	Cite No.	Document Number Number - Kind Code (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages of Relevant Figures Appear	
	1	US-5,474,796	12-12-1995	Brennan		
	2	US-5,541,308	07-30-1996	Hogan et al.		
	3	US-6,232,063	05-15-2001	Beckmann et al.		
	4	US-6,372,480	04-16-2002	Narva et al.		
	5	US-6,395,485	05-28-2002	DeBeuckeleer		
	6	US-6,458,584	10-01-2002	Mirzabekov et al.		
	7	US-6,825,400	11-30-2004	Behr et al.		
	8	US-7,112,721	09-26-2006	Fabijanski et al.		
	9	US-7,323,556	01-29-2008	Bing et al.		
	10	US-2002/0013960	01-31-2002	Behr et al.		
	11	US-2002/0102582	08-01-2002	Levine		
	12	US-2002/0199215	12-26-2002	Boets et al.		
	13	US-2003/0198943	10-23-2003	Remacle et al.		
	14	US-2006/0141495	06-29-2006	Wu		
	15	US-2008/0166725	07-10-2008	Bing et al.		
	16	US-2008/0166726	07-10-2008	Bing et al.		
	17	US-2008/0171334	07-17-2008	Bing et al.		
	18	US-2008/0182256	07-31-2008	Bing et al.		
FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No.	Foreign Patent Document Country Code - Number Kind Code (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	English Language Translation Attached
	19	WO 84/02913	08-02-1984	Monsanto Company		
	20	EP 0 857 791 A2	12-08-1998	Boehringer Mannheim GmbH		
	21	WO 01/14417	03-01-2001	Mycogen Corporation		
	22	EP 1 167 531 A1	02-01-2002	Monsanto Technology, LLC		
Examiner Signature	/Anne Kubelik/			Date Considered	01/03/2013	

*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.K./

Receipt date: 10/19/2010

12907488 - GAU: 1638

Substitute for form 1449/PTO (Revised 07/2007) INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Use as many sheets as necessary)</i>				Complete if Known	
				Application Number	To be assigned
				Filing Date	Concurrently herewith
				First Named Inventor	James Wayne Bing
				Art Unit	To be assigned
				Examiner Name	To be assigned
Sheet	2	of	2	Attorney Docket Number	035718/387563

FOREIGN PATENT DOCUMENTS (CONT.)						
	23	WO 2002/15701	02-28-2002	Syngenta Participations AG		
	24	WO 03/052073	06-26-2003	Syngenta Participations AG		
	25	WO 2004/011702 A2	02-05-2004	Monsanto Technology LLC		
OTHER DOCUMENTS						
Examiner Initials*	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.				English Language Translation Attached
	26	BUCK, <i>et al.</i> , "Design Strategies and Performance of Custom DNA Sequencing Primers," <i>BioTechniques</i> , 1999, Vol. 27, pp. 528-536.				
	27	CRICKMORE, <i>et al.</i> , http://www.lifesci.sussex.ac.uk/Home/Neil_Crickmore/Bt/ , 2009, pp. 1-11.				
no date	28	ELLIS, <i>et al.</i> , "Novel <i>Bacillus thuringiensis</i> Binary Insecticidal Crystal Proteins Active on Western corn Rootworm, <i>Diabrotica virgifera virgifera</i> LeConte," <i>Appl and Envir Microbiology</i> , Vol 63(3), pp. 1137-1145, XP002985898.				
	29	HERMAN, <i>et al.</i> , "Binary Insecticidal Crystal Protein from <i>Bacillus thuringiensis</i> , Strain PS149B1: Effects of Individual Protein Components and Mixtures in Laboratory Bioassays," <i>Journal of Economic Entomology</i> , 2002, Vol. 95(3), pp. 635-639.				
	30	HUNST AND ROOD, "Application for the Determination of Nonregulated Status for Bt Cry/34/35Ab1 Insect-Resistant, Glufosinate-Tolerant Corn: Corn Line 59122, U.S. Department of Agriculture, Animal and Plant Health Inspection Service, 2004, pp. 1-237, XP 002384226.				
	31	LOWE, <i>et al.</i> , "A computer program for selection of oligonucleotide primers for polymerase chain reactions," <i>Nucleic Acids Research</i> , 1990, Vol. 18(7), pp. 1757-1761.				
	32	MOELLENBECK, <i>et al.</i> , "Insecticidal proteins from <i>Bacillus thuringiensis</i> protect corn from corn rootworms," <i>nature biotechnology</i> , 2001, Vol. 19, pp. 668-672.				
	33	RICKER, Karin, "Biotechnology Consultation Note to the File BNF No. 000081, U.S. Food and Drug Administration (2004), Pages 1-6, XP002384225.				
	34	Stratagene Catalog, page 40, 1988.				
	35	Sequence Search Reports, OM nucleic - nucleic search, 2009, pp. 1-6.				
	36	WHITELAW, <i>et al.</i> PUFTW67TB ZM_0.6_1.0KB Zea mays genomic clone ZMMBTa0732K13, genomic survey sequence, 2003, EMBL Accession No. CG069192.				
	37	WHITELAW, <i>et al.</i> GenBank Accession No.BZ739496, 2003.				
	38	ZAMBRYSKI, <i>et al.</i> , GenBank Accession N. TIP37TD2, 1996.				

Examiner Signature	/Anne Kubelik/	Date Considered	01/03/2013
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*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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Receipt date: 10/11/2012

12907488 - GAU: 1638

Substitute for form 1449/PTO (Revised 07/2007) INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Use as many sheets as necessary)</i>				Complete if Known	
				Application Number	12/907,488
				Filing Date	October 19, 2010
				First Named Inventor	James Wayne Bing
				Art Unit	1638
Examiner Name	Anne R. Kubelik				
Sheet	1	of	1	Attorney Docket Number	035718/387563

US PATENT DOCUMENTS					
Examiner Initials*	Cite No.	Document Number Number - Kind Code (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages of Relevant Figures Appear

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No.	Foreign Patent Document Country Code - Number Kind Code (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	English Language Translation Attached
	39	WO 2004/011601 A2	02-05-2004	Monsanto Technology		

OTHER DOCUMENTS			
Examiner Initials*	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	English Language Translation Attached
	40	HAMMACK, L., et al., "Larval Sampling and Instar Determination in Field Populations of Northern and Western Corn Rootworm (Coleoptera: Chrysomelidae)," Journal of Economic Entomology, 2003, Vol. 96(4), pp. 1153-1159.	

Examiner Signature	/Anne Kubelik/	Date Considered	01/10/2013
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*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.K./

<i>Search Notes</i> 	Application/Control No. 12907488	Applicant(s)/Patent Under Reexamination BING ET AL.
	Examiner ANNE KUBELIK	Art Unit 1638

SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
SEQ ID NO:33 and 35	1/3/13	ark

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No.: 12/907,488 Confirmation No.: 2088
Applicant(s): Bing *et al.*
Filed: October 19, 2010
Art Unit: 1638
Examiner: Anne R. Kubelik
Title: CORN EVENT DAS-59122-7 AND METHODS FOR DETECTION THEREOF

Docket No.: 035718/387563
Customer No.: 29122

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT UNDER 37 C.F.R. § 1.111

Sir:

In response to the Office Action dated January 18, 2013, please amend the above-identified application as follows:

Amendments to the Specification begin on page 2 of this paper.

Amendments to the Claims are reflected in the listing of claims beginning on page 4 of this paper.

Remarks/Arguments begin on page 6 of this paper.

An **Appendix** is attached immediately following page 12 of this paper.

Appl. No.: 12/907,488
Amdt. dated April 16, 2013
Reply to Office Action of January 18, 2013

Amendments to the Specification:

Please replace the first paragraph on page 1, which appears immediately after the section heading, "CROSS-REFERENCE TO RELATED APPLICATIONS", with the following paragraph.

This application is a divisional of U.S. Serial No. 11/938,483, filed November 12, 2007, which is a divisional of U.S. Serial [[.]] No. 11/237,222 filed September 28, 2005, now U.S. Patent No. 7,323,556, which claims the benefit of U.S. Provisional Application Serial No. 60/614,225, filed September 29, 2004, the contents of all of which are herein incorporated by reference in their entirety.

Please insert the following paragraph on page 26 immediately after the paragraph that begins at line 1 and ends at line 9 and immediately before the paragraph that begins at line 10.

Applicants made a deposit of at least 2500 seeds of hybrid corn (maize) seed comprising event DAS-59122-7 on October 4, 2010 with the American Type Culture Collection (ATCC), Manassas, VA 20110 USA. The deposit was assigned ATCC Patent Deposit Designation PTA-11384. Access to this deposit will be available during the pendency of the application to the Commissioner of Patents and Trademarks and persons determined by the Commissioner to be entitled thereto upon request. Upon the grant of a patent from the present application, Applicants will make the deposit available to the public pursuant to 37 C.F.R. § 1.808. This deposit of hybrid corn (maize) seed comprising event DAS-59122-7 will be maintained in the ATCC depository, which is a public depository, for a period of 30 years, or 5 years after the most recent request, or for the enforceable life of the patent, whichever is longer, and will be replaced if it becomes nonviable during that period. Additionally, Applicant has or will satisfy all the requirements of 37 C.F.R. §§ 1.801-1.809, including providing an indication of the viability of the sample upon deposit. Applicant has no authority to waive any restrictions imposed by law on

Appl. No.: 12/907,488
Amdt. dated April 16, 2013
Reply to Office Action of January 18, 2013

the transfer of biological material or its transportation in commerce. Applicant does not waive any infringement of their rights granted under this patent or under the Plant Variety Protection Act (7 U.S.C. § 2321 et seq.).

Amendments to the Claims:

1. (Original) An isolated DNA molecule comprising a junction sequence comprising a sequence selected from the group consisting of SEQ ID NO: 33, 35, and complements thereof.
2. (Currently Amended) An insect resistant corn plant, or parts thereof, wherein DNA having at least one nucleotide sequence selected from the group consisting of SEQ ID NO: 33, 35, and complements thereof forms part of the plant's genome, wherein said plant or said parts thereof comprise corn event DAS-59122-7.
3. (Currently Amended) A descent plant of the insect resistant corn plant of claim 2, wherein DNA having at least one nucleotide sequence selected from the group consisting of SEQ ID NO: 33, 35, and complements thereof, forms part of the descent plant's genome, wherein said descent plant comprises corn event DAS-59122-7.
4. (Currently Amended) A seed of the plant of claim 2, wherein DNA having at least one nucleotide sequence selected from the group consisting of SEQ ID NO: 33, 35, and complements thereof, forms part of the seed's genome, wherein said seed comprises corn event DAS-59122-7.
5. (Currently Amended) A seed of the plant of claim 3, wherein DNA having at least one nucleotide sequence selected from the group consisting of SEQ ID NO: 33, 35, and complements thereof, forms part of the seed's genome, wherein said seed comprises corn event DAS-59122-7.
6. (Currently Amended) A method of producing an insect resistant corn plant, said method comprising breeding with the plant of claim 2, and selecting progeny by analyzing for at least one nucleotide sequence selected from the group consisting of SEQ ID NO: 33, 35, and

complements thereof, wherein said progeny comprises corn event DAS-59122-7.

7. (Currently Amended) A method of producing an insect resistant corn plant, said method comprising breeding with the plant of claim 3, and selecting progeny by analyzing for at least one nucleotide sequence selected from the group consisting of SEQ ID NO: 33, 35, and complements thereof, wherein said progeny comprises corn event DAS-59122-7.

8. (Original) A method of detecting event DAS-59122-7 in corn tissue, said method comprising:

(a) contacting a sample of said corn tissue with a polynucleotide probe that hybridizes under stringent hybridization conditions with one or more DNA sequences selected from the group consisting of SEQ ID NO: 33, 35, and complements thereof;

(b) subjecting said sample and probe to stringent hybridization conditions;
and

(c) analyzing for hybridization of the probe.

9. (Currently Amended) A DNA detection kit comprising a polynucleotide probe capable of uniquely identifying event DAS-59122-7, wherein said probe comprises a sequence of at least eleven contiguous nucleotides, ~~and~~ wherein said probe hybridizes under stringent hybridization conditions with one or more DNA sequences selected from the group consisting of SEQ ID NO: 33, 35, and complements thereof, and wherein the probe hybridizes specifically to a junction sequence of event DAS-59122-7.

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REMARKS/ARGUMENTS

Status of the Claims

Claims 1-9 are pending. Claims 2-9 stand rejected.

Applicants respectfully acknowledge that Examiner Kubelik has allowed claim 1.

Applicants respectfully acknowledge that Examiner Kubelik has determined that claims 1-8 are free of the prior art.

Claims 2-7 have been amended to recite that the claimed plant, parts thereof, descent plant, seed, or progeny comprises corn event DAS-59122-7. This amendment to the claims is fully supported by the original claims and the specification.

Claim 9 has been amended to point out more distinctly that the polynucleotide probe hybridizes specifically to a junction sequence of event DAS-59122-7. Support for this amendment can be found, for example, in the specification at page 8, lines 3-7, and at page 12, lines 3-6.

No new matter has been added by way of amendment of the claims.

Reexamination and reconsideration of the application as amended are respectfully requested in view of the following remarks.

Previously Submitted Information Disclosure Statement

It is noted that on the copy of the PTO Form 1449 that accompanied the Office Action of January 18, 2013, the Examiner lined through citation number 28 of Ellis *et al.*, which, according to the copy, is indicative of this reference not having been considered by the Examiner. The Examiner states that the date for the reference has not been provided.

Applicants submit concurrently herewith a supplemental Information Disclosure Statement in order to correct the inadvertent typographical errors in the Ellis *et al.* citation. In order to facilitate review of this document by the Examiner, Applicants submit concurrently herewith a copy of the Ellis *et al.* document.

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Applicants respectfully request the Examiner to consider the Ellis *et al.* reference and return an initialed copy of Form 1449 indicating the same with the next communication from the USPTO.

Amendments to the Specification

Applicants respectfully request the Office to enter the above amendments to the specification. The amendments to the specification are formal in nature and thus, do not introduce new matter.

Applicants amend the specification in the first paragraph to indicate that U.S. Serial No. 11/237,222 issued as U.S. Patent No. 7,323,556 and to delete the extraneous period that immediately follows "Serial" in line 2.

Applicants amend the specification for formal reasons to add a paragraph on page 26 that provides required information concerning the biological deposit of hybrid corn (maize) seed comprising event DAS-59122-7. Applicants have amended the specification as requested by the Examiner on page 4 of the January 18, 2013 Office Action.

Applicants provide herewith in the Appendix a copy of the Certificate of Deposit from the ATCC. The Certificate includes information regarding the viability of the deposit as well as the date of deposit and the accession number for the deposit.

The Rejection of the Claims Under 35 U.S.C. § 112, First Paragraph, For Failure to Comply With the Enablement Requirement Should Be Withdrawn

Claims 2-8 are rejected under 35 U.S.C. § 112, first paragraph, for allegedly failing to comply with the enablement requirement. Claims 2-7 have been amended. This rejection is respectfully traversed.

The Office Action indicates that SEQ ID NOS: 33 and 35 are not sufficient to confer insect resistance and that the only insect resistant corn plants taught in the specification are DAS-59122-7 plants.

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Without acquiescing to the Examiner's position and in the interest of expediting prosecution, claims 2-7 have been amended to recite that the claimed plant, parts thereof, descent plant, seed, or progeny comprises corn event DAS-59122-7.

The Office Action further states that this embodiment could be enabled if there were a repeatable process to obtain the exact seed in each occurrence but that the specification does not teach such a repeatable process.

The Office Action further indicates that if a seed comprising DAS-59122-7 is not obtainable or available, a seed deposit may satisfy the requirements of 35 U.S.C. § 112.

Applicants provide herewith in the Appendix a copy of the Certificate of Deposit from the ATCC. The Certificate includes information regarding the viability of the deposit as well as the date of deposit and the accession number for the deposit.

In addition, as stated above, Applicants have amended the specification to add the required information concerning the biological deposit of hybrid corn (maize) seed comprising event DAS-59122-7.

In view of the amendments and above remarks, the Examiner is respectfully requested to withdraw the rejection of claims 2-8 under 35 U.S.C. § 112, first paragraph.

The Rejection of the Claims Under 35 U.S.C. § 112, First Paragraph, For Failure to Comply With the Written Description Requirement Should Be Withdrawn

Claim 9 is rejected under 35 U.S.C. § 112, first paragraph, for allegedly failing to comply with the written description requirement. Claim 9 has been amended. This rejection is respectfully traversed.

The Office Action alleges that the specification describes no 11 base pair long nucleic acid molecule that uniquely identifies event DAS-59122-7 under stringent hybridization conditions. The Office Action, on page 5, first paragraph, further alleges that "[t]he structural features that 11 base pair long fragments of SEQ ID NO:32 that comprise the junction site and that uniquely identify event DAS-59122-7 under stringent hybridization from other 11 base pair long fragments of SEQ ID NO:32 that comprise the junction site are not described in the specification." The Office Action concludes that one of skill in the art would not recognize that

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Applicants were in possession of the necessary common attributes or features of the genus in view of the lack of a disclosed species.

Applicants respectfully submit that there appears to be an error in the Office Action in the above cited statement that appears on page 5, first paragraph of the Office Action. In the Office Action, the sequence in the rejection is identified as "SEQ ID NO:32," however SEQ ID NO:32 is not recited in claim 9. Claim 9 recites SEQ ID NOS: 33 and 35. Applicants believe that the Examiner probably meant to state SEQ ID NO:33 and 35 in this rejection. Based on this assumption, Applicants are replying to this rejection as it relates to SEQ ID NOS:33 and 35. If this is not the case, Applicants respectfully request a further opportunity to respond to this rejection.

Applicants respectfully disagree with the position of the Office that the specification does not provide an adequate written description of the subject matter encompassed by claim 9. One of ordinary skill in the art in view of Applicants' original disclosure, including the Sequence Listing (particularly SEQ ID NOS: 23, 33 and 35) would be able to identify fragments of at least 11 base pairs that comprise the junction sequences within SEQ ID NOS: 33 and 35. For example, the specification discloses that:

DNA molecules are provided that *comprise at least one junction sequence* of DAS-59122-7 selected from the group consisting of SEQ ID NO: 32, 33, 34 and 35 and complements thereof; wherein a *junction sequence spans the junction between heterologous DNA inserted into the genome and the DNA from the corn cell flanking the insertion site, i.e. flanking DNA, and is diagnostic for the DAS-59122-7 event.*

Specification, p.8, lines 3-7 (emphasis added). The specification further discloses in Figure 1, the DNA sequence, SEQ ID NO: 23, showing the transgenic insert PHI17662A, as well as the sequences flanking the transgenic insert. In particular, the 5' and 3' border regions are underlined in Figure 1 and are bp 1 to bp 2593 and bp 9937 to bp 11922, respectively. Specification at p.9, lines 16-20. In addition, the specification discloses the location of SEQ ID NOS: 33 and 35 within SEQ ID NO: 23 in Table 3 on page 35.

While Applicants believe that the specification provides an adequate written description of the probes encompassed by claim 9, Applicants have amended claim 9, in the interest of expediting prosecution, to point out more distinctly that the polynucleotide probe hybridizes specifically to a junction sequence of event DAS-59122-7.

In view of the disclosure of the structure of junction sequences within SEQ ID NOS:33 and 35, a person having ordinary skill in the art would recognize the common structural attributes of probes that are encompassed by claim 9, wherein such probes are capable of uniquely identifying event DAS-59122-7, comprise a sequence of at least eleven contiguous nucleotides, hybridize under stringent hybridization conditions with one or more DNA sequences selected from the group consisting of SEQ ID NOS:33 and 35 and complements thereof, and hybridize specifically to a junction sequence of event DAS-59122-7. Accordingly, the specification provides an adequate written description of the genus of probes encompassed by claim 9.

In view of the amendment of claim 9 and the above remarks, it is submitted that the rejection of claim 9 under 35 U.S.C. § 112, first paragraph, for failing to comply with the written description requirement should be withdrawn.

The Rejection of the Claims Under 35 U.S.C. § 102(b) Should Be Withdrawn

Claim 9 is rejected under 35 U.S.C. § 102(b) as being anticipated by Whitelaw *et al.* (2003, GenBank Accession No. CG069192). Claim 9 has been amended. This rejection is respectfully traversed.

The Office Action indicates that Whitelaw *et al.* teaches a polynucleotide that would hybridize to at least 11 contiguous nucleotides of SEQ ID NO: 33 or 35.

The polynucleotide taught by Whitelaw *et al.* corresponds to the sequence of maize genomic DNA. The polynucleotide taught by Whitelaw *et al.* does not comprise a junction sequence of event DAS-59122-7.

In contrast to the polynucleotide of Whitelaw *et al.*, SEQ ID NOS: 33 and 35 each comprise at least one of the unique junction sequences of event DAS-59122-7. Such junction sequences span the junction between heterologous DNA inserted into the genome and the DNA

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from the corn cell flanking the insertion site and are diagnostic for the DAS-59122-7 event as disclosed in the following paragraph in the instant specification.

DNA molecules are provided that comprise at least one *junction sequence of DAS-59122-7* selected from the group consisting of SEQ ID NO: 32, 33, 34, and 35 and complements thereof; *wherein a junction sequence spans the junction between heterologous DNA inserted into the genome and the DNA from the corn cell flanking the insertion site*, i.e. flanking DNA, and is diagnostic for the DAS-59122-7 event.

Specification, p. 8, lines 3-7 (emphasis added).

In an effort to expedite prosecution, Applicants have herein amended claim 9 to point out more distinctly that the polynucleotide probe hybridizes specifically to a junction sequence of event DAS-59122-7.

As amended, claim 9 is not anticipated by Whitelaw *et al.* because this reference does not disclose a polynucleotide of at least 11 nucleotides which spans a junction sequence of event DAS-59122-7.

In view of the amendments and remarks, it is submitted that the rejection of claim 9 under 35 U.S.C. § 102(b) should be withdrawn.

CONCLUSION

In view of the amendments and remarks, Applicant submits that the rejections of the claims are overcome. Applicant respectfully submits that this application is now in condition for allowance. Early notice to this effect is solicited.

If in the opinion of the Examiner a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required

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Amdt. dated April 16, 2013
Reply to Office Action of January 18, 2013

therefor (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 16-0605.

Respectfully submitted,

/denise m. ray/

Denise M. Ray
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ELECTRONICALLY FILED USING THE EFS-WEB ELECTRONIC FILING SYSTEM OF THE UNITED STATES PATENT & TRADEMARK OFFICE ON April 16, 2013.

APPENDIX



**BUDAPEST RESTRICTED CERTIFICATE OF DEPOSIT
BUDAPEST TREATY ON THE INTERNATIONAL RECOGNITION OF
THE DEPOSIT OF MICROORGANISMS FOR THE PURPOSES OF PATENT PROCEDURE
INTERNATIONAL FORM
RECEIPT IN THE CASE OF AN ORIGINAL DEPOSIT ISSUED PURSUANT TO RULE 7.3
AND VIABILITY STATEMENT ISSUED PURSUANT TO RULE 10.2**

The American Type Culture Collection (ATCC®) has received your deposit of seeds/strain(s)/strain(s) in connection with the filing of an application for patent. The following information is provided to fulfill Patent Office requirements.

Claire L. Moxon
Pioneer Hi-Bred International Inc
7250 N.W. 62nd Avenue
Johnston, IA 50131-0552

Deposited on Behalf of: **Pioneer Hi-Bred International Inc**

Date of Receipt of seeds/strain(s) by the ATCC®: **October 04, 2010**

Identification Reference by Depositor: **ATCC ®Patent Deposit Designation:** **Quantity Received:**

Hybrid Corn (maize) seed with Event DAS-59122-7 PTA-11384 100 packets/25 seeds in each packet

The ATCC® understands that:

1. The deposit of these seeds/strain(s) does not grant ATCC® a license, either express or implied, to infringe the patent, and our release of these seeds/strain(s) to others does not grant them a license, either express or implied, to infringe the patent.
2. If the deposit should die or be destroyed during the effective term of the patent, it shall be your responsibility to replace it with viable material. It is also your responsibility to supply a sufficient quantity for distribution for the deposit term. ATCC® will distribute and maintain the material for 30 years or 5 years following the most recent request for the deposit, whichever is longer. The United States and many other countries are signatory to the Budapest Treaty.

Prior to the issuance of a U.S. Patent, the ATCC® agrees in consideration for a one-time service charge, not to distribute these seeds/strain(s) or any information relating thereto or to their deposit except as instructed by the depositor or relevant patent office. After relevant patent issues we are responsible to release the seeds/strain(s) and they will be made available for distribution to the public without any restrictions. We will inform you of requests for the seeds/strain(s) for 30 years from date of deposit.

Doc ID: 20127
Revision: 2
Effective Date: 10/13/2009



The deposit was tested **October 18, 2010** and on that date, the seeds/strain(s) were viable
International Depository Authority: American Type Culture Collection (ATCC®), Manassas, VA, USA

Signature of person having authority to represent ATCC®:

Latha Ramakrishnan

Digitally signed by Latha
Ramakrishnan
DN: cn=Latha Ramakrishnan,
o=ATCC, ou=IPLS Department,
email=lramakrishnan@atcc.org, c=US
Date: 2010.10.20 14:33:15 -0400

October 20, 2010

ATCC® Patent Depository

Date

cc: David A. Saravitz

Ref: Docket or Case No: 035718/384480 (PHI 1895D4)

Doc ID: 20127
Revision: 2
Effective Date: 10/13/2009

Attorney's Docket No. 035718/387563

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re:	Bing <i>et al.</i>	Confirmation No.:	2088
Appl. No.:	12/907,488	Group Art Unit:	1638
Filed:	October 19, 2010	Examiner:	Anne R. Kubelik
For:	CORN EVENT DAS-59122-7 AND METHODS FOR DETECTION THEREOF		

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

**INFORMATION DISCLOSURE STATEMENT
UNDER 37 C.F.R. § 1.97(c)**

Sir:

Attached is a list of documents on form PTO-1449 along with a copy of any cited foreign patent documents and non-patent literature document in accordance with 37 CFR 1.98(a)(2).

It is requested that the Examiner consider these documents and officially make them of record in accordance with the provisions of 37 C.F.R. § 1.97 and Section 609 of the MPEP. By identifying the listed documents, Applicant in no way makes any admission as to the prior art status of the listed documents, but is instead identifying the listed documents for the sake of full disclosure.

This Information Disclosure Statement is submitted in accordance with 37 C.F.R. § 1.97(c), before final Office Action or Allowance, whichever is earlier.

In re: Bing *et al.*
Appl. No.: 12/907,488
Filed: October 19, 2010
Page 2

The \$180.00 fee specified in 37 C.F.R. § 1.17(p) is being paid at the time of e-filing. The Commissioner is authorized to charge any additional fee, or credit any refund, to our Deposit Account No. 16-0605.

Respectfully submitted,

/denise m. ray/

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Substitute for form 1449/PTO (Revised 07/2007) INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Use as many sheets as necessary)</i>				Complete if Known	
				Application Number	12/907,488
				Filing Date	October 19, 2010
				First Named Inventor	James Wayne Bing
				Art Unit	1638
Examiner Name	Anne R. Kubelik				
Sheet	1	of	1	Attorney Docket Number	035718/387563

US PATENT DOCUMENTS					
Examiner Initials*	Cite No.	Document Number Number - Kind Code (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages of Relevant Figures Appear

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No.	Foreign Patent Document Country Code - Number Kind Code (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	English Language Translation Attached

OTHER DOCUMENTS			
Examiner Initials*	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s) , volume-issue number(s), publisher, city and/or country where published.	English Language Translation Attached
	41	ELLIS, <i>et al.</i> , "Novel <i>Bacillus thuringiensis</i> Binary Insecticidal Crystal Proteins Active on Western corn Rootworm, <i>Diabrotica virgifera virgifera</i> LeConte," <i>App and Envir Microbiology</i> , 2002, Vol 68(3), pp. 1137-1145, XP002985898.	

Examiner Signature		Date Considered	
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*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Electronic Patent Application Fee Transmittal				
Application Number:		12907488		
Filing Date:		19-Oct-2010		
Title of Invention:		CORN EVENT DAS-59122-7 AND METHODS FOR DETECTION THEREOF		
First Named Inventor/Applicant Name:		JAMES WAYNE BING		
Filer:		W. Murray Spruill/Mackenzie Willow-Johnson		
Attorney Docket Number:		035718/387563		
Filed as Large Entity				
Utility under 35 USC 111(a) Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
Total in USD (\$)				180

Electronic Acknowledgement Receipt	
EFS ID:	15530347
Application Number:	12907488
International Application Number:	
Confirmation Number:	2088
Title of Invention:	CORN EVENT DAS-59122-7 AND METHODS FOR DETECTION THEREOF
First Named Inventor/Applicant Name:	JAMES WAYNE BING
Customer Number:	29122
Filer:	W. Murray Spruill/Mackenzie Willow-Johnson
Filer Authorized By:	W. Murray Spruill
Attorney Docket Number:	035718/387563
Receipt Date:	16-APR-2013
Filing Date:	19-OCT-2010
Time Stamp:	15:06:27
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	\$180
RAM confirmation Number	1699
Deposit Account	160605
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees) Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)	

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)					
Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)					
Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)					
File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		387563_1895D9D_Amendment.pdf	638540	yes	15
			2d966def539ab8f1e049f5ceb7dc8a4399ed85ce		
	Multipart Description/PDF files in .zip description				
	Document Description		Start		End
	Amendment/Req. Reconsideration-After Non-Final Reject		1		1
	Specification		2		3
	Claims		4		5
	Applicant Arguments/Remarks Made in an Amendment		6		15
Warnings:					
Information:					
2		387563_1895D9D_IDS.pdf	124097	yes	3
			514777cde9b2d7d71e270c41f3830294feddc21		
	Multipart Description/PDF files in .zip description				
	Document Description		Start		End
	Transmittal Letter		1		2
	Information Disclosure Statement (IDS) Form (SB08)		3		3
Warnings:					
Information:					
3	Non Patent Literature	387563_Ellis_Reference.PDF	2630597	no	9
			64291ad70d09af02bddc2ac7455ee9f8a9bae4e5		
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	30865	no	2
			03e2b6dd8d21e48e3100555fb60819c3b915cf8e		
Warnings:					
Information:					
Total Files Size (in bytes):			3424099		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875				Application or Docket Number 12/907,488		Filing Date 10/19/2010		☐ To be Mailed						
ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO														
APPLICATION AS FILED – PART I														
(Column 1)		(Column 2)												
FOR		NUMBER FILED		NUMBER EXTRA		RATE (\$)		FEE (\$)						
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))		N/A		N/A		N/A								
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))		N/A		N/A		N/A								
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))		N/A		N/A		N/A								
TOTAL CLAIMS (37 CFR 1.16(i))		minus 20 =		*		X \$ =								
INDEPENDENT CLAIMS (37 CFR 1.16(h))		minus 3 =		*		X \$ =								
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))		If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).												
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))														
* If the difference in column 1 is less than zero, enter "0" in column 2.						TOTAL								
APPLICATION AS AMENDED – PART II														
(Column 1)		(Column 2)		(Column 3)										
AMENDMENT	04/16/2013		CLAIMS REMAINING AFTER AMENDMENT			HIGHEST NUMBER PREVIOUSLY PAID FOR		PRESENT EXTRA		RATE (\$)		ADDITIONAL FEE (\$)		
	Total (37 CFR 1.16(i))		* 9		Minus	** 20		= 0		X \$80 =		0		
	Independent (37 CFR 1.16(h))		* 4		Minus	*** 4		= 0		X \$420 =		0		
	☐ Application Size Fee (37 CFR 1.16(s))													
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))													
	TOTAL ADD'L FEE										0			
(Column 1)		(Column 2)		(Column 3)										
AMENDMENT			CLAIMS REMAINING AFTER AMENDMENT			HIGHEST NUMBER PREVIOUSLY PAID FOR		PRESENT EXTRA		RATE (\$)		ADDITIONAL FEE (\$)		
	Total (37 CFR 1.16(i))		*		Minus	**		=		X \$ =				
	Independent (37 CFR 1.16(h))		*		Minus	***		=		X \$ =				
	☐ Application Size Fee (37 CFR 1.16(s))													
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))													
	TOTAL ADD'L FEE													
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.										LIE /DORRETTA BROOKS/				

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/907,488	10/19/2010	JAMES WAYNE BING	035718/387563	2088

29122	7590	05/24/2013
ALSTON & BIRD LLP PIONEER HI-BRED INTERNATIONAL, INC. BANK OF AMERICA PLAZA 101 SOUTH TRYON STREET, SUITE 4000 CHARLOTTE, NC 28280-4000		

EXAMINER	
KUBELIK, ANNE R	

ART UNIT	PAPER NUMBER
1638	

NOTIFICATION DATE	DELIVERY MODE
05/24/2013	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

usptomail@alston.com

Office Action Summary	Application No. 12/907,488	Applicant(s) BING ET AL.	
	Examiner ANNE KUBELIK	Art Unit 1638	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 16 April 2013.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 5) ☐ Claim(s) 1-9 is/are pending in the application.
5a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 6) ☐ Claim(s) 1 is/are allowed.
- 7) ☐ Claim(s) 2-9 is/are rejected.
- 8) ☐ Claim(s) ____ is/are objected to.
- 9) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

- a) ☐ All b) ☐ Some * c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Interim copies:

- a) ☐ All b) ☐ Some c) ☐ None of the: Interim copies of the priority documents have been received.

Attachment(s)

- | | |
|--|---|
| 1) ☐ Notice of References Cited (PTO-892) | 3) ☐ Interview Summary (PTO-413) |
| 2) ☒ Information Disclosure Statement(s) (PTO/SB/08) | Paper No(s)/Mail Date. ____. |
| Paper No(s)/Mail Date ____. | 4) ☐ Other: ____. |

DETAILED ACTION

1. Claims 1-9 are pending.
2. The rejection of claim 9 under 35 U.S.C. 102(b) as being anticipated by Whitelaw et al (2003, GenBank Accession No. CG069192) is withdrawn in light of Applicant's amendment to the claim.

Claim Rejections - 35 USC § 112

The following is a quotation of 35 U.S.C. 112(a):

(a) IN GENERAL.—The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor or joint inventor of carrying out the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), first paragraph:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 2-8 are rejected under 35 U.S.C. 112(a) or 35 U.S.C. 112 (pre-AIA), first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Due to Applicant's amendment of the claim, the rejection is modified from the set forth in the Office action mailed 18 January 2013. Applicant's arguments filed 16 April 2013 have been fully considered but they are not persuasive.

The claims are broadly drawn to insect resistant plants comprising SEQ ID NO:33 or 35.

SEQ ID NO:33 or 35 are not sufficient to confer insect resistance to plants, as they do not encode insect resistance genes.

The only insect resistant corn plants taught in the specification are DAS-59122-7 event plants. This embodiment could be enabled if there were a repeatable process to obtain the exact same seed in each occurrence.

The specification does not teach a repeatable process to obtain the exact same seed in each occurrence. DAS-59122-7 event seed must be obtainable by a repeatable method set forth in the specification or otherwise be readily available to the public. If a seed is not so obtainable or available, a deposit thereof may satisfy the requirements of 35 U.S.C. 112. It is not apparent if such a seed is readily available to the public.

If the deposit of these seeds is made under the terms of the Budapest Treaty, then an affidavit or declaration by the Applicant, or a statement by an attorney of record over his or her signature and registration number, stating that the seeds will be irrevocably and without restriction or condition released to the public upon the issuance of a patent would satisfy the deposit requirement made herein. A minimum deposit of 2500 seeds is considered sufficient in the ordinary case to assure availability through the period for which a deposit must be maintained.

If the deposit has not been made under the Budapest Treaty, then in order to certify that the deposit, meets the criteria set forth in 37 CFR 1.801-1.809, Applicant may provide assurance of compliance by an affidavit or declaration, or by a statement by an attorney of record over his or her signature and registration number showing that

(a) during the pendency of the application, access to the invention will be afforded to the Commissioner upon request;

(b) all restrictions upon availability to the public will be irrevocably removed upon granting of the patent;

(c) the deposit will be maintained in a public depository for a period of 30 years or 5 years after the last request or for the enforceable life of the patent, whichever is longer;

(d) the viability of the biological material at the time of deposit will be tested (see 37 CFR 1.807); and

(e) the deposit will be replaced if it should ever become inviable.

In addition, the identifying information set forth in 37 CFR 1.809(d) should be added to the specification. See 37 CFR 1.801 - 1.809 [MPEP 2401-2411.05] for additional explanation of these requirements.

Deposit of DAS-59122-7 event seed would not enable one of skill in the art to make the full scope of insect resistant plants comprising SEQ ID NO:33 or 35, as SEQ ID NO:33 or 35 are not sufficient to confer insect resistance to plants.

Deposit of DAS-59122-7 is also required to enable the method of claim 8, as event DAS-59122-7 could not be detected in seed unless event DAS-59122-7 were enabled.

Response to Arguments

Applicant urges that they have amended the specification to add the required information and provided a certificate of deposit from the ATCC (response pg 8).

This is not found persuasive because the assurance of compliance must be by an affidavit or declaration, or by a statement by an attorney of record over his or her signature and

registration number. Further, there is no statement that all restrictions upon availability to the public will be irrevocably removed upon granting of the patent.

4. Claim 9 is rejected under 35 U.S.C. 112(a) or 35 U.S.C. 112 (pre-AIA), first paragraph, as failing to comply with written description requirement. The claim(s) contains subject matter that was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The rejection is repeated for the reasons of record as set forth in the Office action mailed 18 January 2013. Applicant's arguments filed 16 April 2013 have been fully considered but they are not persuasive.

The claim is drawn to a nucleic acid that comprises 11 base pairs of SEQ ID NO:33 or 35 and that uniquely identifies event DAS-59122-7 under stringent hybridization and hybridizes specifically to a junction sequence of event DAS-59122-7.

The specification describes no 11 base pair long nucleic acids that uniquely identifies event DAS-59122-7 under stringent hybridization or that hybridizes specifically to a junction sequence of event DAS-59122-7.

The structural features that 11 base pair long fragments of SEQ ID NO:33 or 35 that comprise the junction site and that uniquely identify event DAS-59122-7 under stringent hybridization from other 11 base pair long fragments of SEQ ID NO:33 or 35 that comprise the junction site are not described in the specification.

One of skill in the art would not recognize that Applicant was in possession of the necessary common attributes or features of the genus in view of the lack of a disclosed species.

Hence, Applicant has not, in fact, described the claimed nucleic acids, and the specification fails to provide an adequate written description of the claimed invention.

Therefore, given the lack of written description in the specification with regard to the structural and functional characteristics of the claimed compositions, Applicant does not appear to have been in possession of the claimed genus at the time this application was filed.

Response to Arguments

Applicant urges that recitation of SEQ ID NO:32 is in error, and should refer to SEQ ID NO:33 and 35 (response pg 9).

This is agreed and is corrected above. The examiner thanks Applicant.

Applicant urges that the specification defines a junction sequence as one spanning the junction between genomic sequence and insert DNA, and specifically identifies the sequence in event DAS-59122-7 (response pg 9).

This is not found persuasive because the specification does not describe 11 base pair long fragments of SEQ ID NO:33 and 35 that comprise the junction site and that uniquely identify event DAS-59122-7 under stringent hybridization. The issue here is not that the specification does not describe 11 base pair long fragments of SEQ ID NO:33 or 35 that comprise the junction site and that uniquely identify event DAS-59122-7 but that it does not describe those that do so under unspecified stringent hybridization conditions.

Applicant urges that the claim has been amended (response pg 10).

This is not found persuasive because the amendment does not overcome the issue, for the reason above.

Applicant urges that one of skill in the art would recognize the common structural attributes of probes encompassed by the claim (response pg 10).

This is not found persuasive because 11 base pair long fragments of SEQ ID NO:33 or 35 that uniquely identify an event DAS-59122-7 junction site under unspecified stringent hybridization conditions are not described.

5. Claim 1 is allowed.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anne R. Kubelik, Ph.D., whose telephone number is (571) 272-0801. The examiner can normally be reached Monday through Friday, 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anne Marie Grunberg, can be reached at (571) 272-0975.

The central fax number for official correspondence is (571) 273-8300.

Patent applicants with problems or questions regarding electronic images that can be viewed in the Patent Application Information Retrieval system (PAIR) can now contact the USPTO's Patent Electronic Business Center (Patent EBC) for assistance. Representatives are available to answer your questions daily from 6 am to midnight (EST). The toll free number is (866) 217-9197. When calling please have your application serial or patent number, the type of document you are having an image problem with, the number of pages and the specific nature of the problem. The Patent Electronic Business Center will notify applicants of the resolution of the problem within 5-7 business days. Applicants can also check PAIR to confirm that the problem has been corrected. The USPTO's Patent Electronic Business Center is a complete service center supporting all patent business on the Internet. The USPTO's PAIR system provides Internet-based access to patent application status and history information. It also enables applicants to view the scanned images of their own application file folder(s) as well as general patent information available to the public.

For all other customer support, please call the USPTO Call Center (UCC) at 800-786-9199.

/Anne R Kubelik/
Primary Examiner, Art Unit 1638

Receipt date: 04/16/2013

12907488 - GAU: 1638

Substitute for form 1449/PTO (Revised 07/2007) INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary)				Complete if Known	
				Application Number	12/907,488
				Filing Date	October 19, 2010
				First Named Inventor	James Wayne Bing
				Art Unit	1638
Examiner Name	Anne R. Kubelik				
Sheet	1	of	1	Attorney Docket Number	035718/387563

US PATENT DOCUMENTS						
Examiner Initials*	Cite No.	Document Number Number - Kind Code (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages of Relevant Figures Appear	
FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No.	Foreign Patent Document Country Code - Number Kind Code (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	English Language Translation Attached
OTHER DOCUMENTS						
Examiner Initials*	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.				English Language Translation Attached
	41	ELLIS, <i>et al.</i> , "Novel <i>Bacillus thuringiensis</i> Binary Insecticidal Crystal Proteins Active on Western corn Rootworm, <i>Diabrotica virgifera virgifera</i> LeConte," <i>App and Envir Microbiology</i> , 2002, Vol 68(3), pp. 1137-1145, XP002985898.				

Examiner Signature	/Anne Kubelik/	Date Considered	05/16/2013
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*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.K./

PATENT

**RESPONSE UNDER 37 C.F.R. 1.116 - EXPEDITED
PROCEDURE - EXAMINING GROUP 1638**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No.: 12/907,488 Confirmation No.: 2088
Applicant(s): Bing *et al.*
Filed: October 19, 2010
Art Unit: 1638
Examiner: Anne R. Kubelik
Title: CORN EVENT DAS-59122-7 AND METHODS FOR DETECTION
THEREOF

Docket No.: 035718/387563
Customer No.: 29122

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT AFTER FINAL UNDER 37 C.F.R. § 1.116

Sir:

In response to the Final Office Action dated May 24, 2013, please amend the above-identified application as follows:

Amendments to the Claims are reflected in the listing of claims beginning on page 2 of this paper.

Remarks/Arguments begin on page 4 of this paper.

Amendments to the Claims:

1. (Original) An isolated DNA molecule comprising a junction sequence comprising a sequence selected from the group consisting of SEQ ID NO: 33, 35, and complements thereof.
2. (Currently Amended) An insect resistant corn plant, or ~~part~~ parts thereof, comprising corn event DAS-59122-7, wherein DNA having at least one nucleotide sequence selected from the group consisting of SEQ ID NO: 33, 35, and complements thereof forms part of the plant's genome, ~~wherein said plant or said parts thereof comprise corn event DAS-59122-7~~.
3. (Previously Presented) A descent plant of the insect resistant corn plant of claim 2, wherein DNA having at least one nucleotide sequence selected from the group consisting of SEQ ID NO: 33, 35, and complements thereof, forms part of the descent plant's genome, wherein said descent plant comprises corn event DAS-59122-7.
4. (Previously Presented) A seed of the plant of claim 2, wherein DNA having at least one nucleotide sequence selected from the group consisting of SEQ ID NO: 33, 35, and complements thereof, forms part of the seed's genome, wherein said seed comprises corn event DAS-59122-7.
5. (Previously Presented) A seed of the plant of claim 3, wherein DNA having at least one nucleotide sequence selected from the group consisting of SEQ ID NO: 33, 35, and complements thereof, forms part of the seed's genome, wherein said seed comprises corn event DAS-59122-7.
6. (Previously Presented) A method of producing an insect resistant corn plant, said method comprising breeding with the plant of claim 2, and selecting progeny by analyzing for at

Appl. No.: 12/907,488
Amdt. dated July 23, 2013
Reply to Office action of May 24, 2013

least one nucleotide sequence selected from the group consisting of SEQ ID NO: 33, 35, and complements thereof, wherein said progeny comprises corn event DAS-59122-7.

7. (Previously Presented) A method of producing an insect resistant corn plant, said method comprising breeding with the plant of claim 3, and selecting progeny by analyzing for at least one nucleotide sequence selected from the group consisting of SEQ ID NO: 33, 35, and complements thereof, wherein said progeny comprises corn event DAS-59122-7.

8. (Original) A method of detecting event DAS-59122-7 in corn tissue, said method comprising:

(a) contacting a sample of said corn tissue with a polynucleotide probe that hybridizes under stringent hybridization conditions with one or more DNA sequences selected from the group consisting of SEQ ID NO: 33, 35, and complements thereof;

(b) subjecting said sample and probe to stringent hybridization conditions;
and

(c) analyzing for hybridization of the probe.

9. (Cancelled)

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Amdt. dated July 23, 2013
Reply to Office action of May 24, 2013

REMARKS/ARGUMENTS

Applicants respectfully acknowledge that Examiner Kubelik has allowed claim 1.

As set forth hereinabove, Applicants have made a clarifying amendment to claim 2 as discussed in the telephonic interview on July 19, 2013 with Examiner Kubelik. Applicants' summary of the interview is submitted concurrently herewith. Applicants have also replaced "parts" with "part" in line 1 of this same claim as per the suggestion of Examiner Kubelik. The amendment of claim 2 is fully supported by Applicants' original specification and claims and thus, does not introduce new matter.

Applicants have cancelled claim 9 without prejudice or disclaimer and thus, have obviated the outstanding rejection of this claim under 35 U.S.C. § 112, first paragraph, for failing to comply with the written description requirement.

Applicants also submit concurrently herewith a Declaration Under 37 C.F.R. § 1.802 concerning the biological deposit of seeds of maize event DAS-59122-7 that Applicants made on October 4, 2010. The declaration is by an attorney of record over his or her signature and registration number and states that the seeds will be irrevocably and without restriction or condition released to the public upon the issuance of a patent. During the telephonic interview on July 19, 2013, Examiner Kubelik indicated that the filing of such a declaration or statement concurrently together with Applicants' response to the final Office Action would overcome the outstanding rejection of claims 2-8 under 35 U.S.C. § 112, first paragraph, for failing to comply with the enablement requirement.

Applicants respectfully submit that in view of the Declaration Under 37 C.F.R. § 1.802 filed concurrently herewith, the rejection of claims 2-8 under 35 U.S.C. § 112, first paragraph, for failing to comply with the enablement requirement should be withdrawn.

In view of the amendments and above remarks, Applicants respectfully submit that the rejections of the claims are overcome and that this application is now in condition for allowance. Early notice to this effect is solicited.

Appl. No.: 12/907,488
Amdt. dated July 23, 2013
Reply to Office action of May 24, 2013

If in the opinion of the Examiner a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 C.F.R. § 1.136(a), and any fee required therefor (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 16-0605.

Respectfully submitted,

/david m. saravitz/

David M. Saravitz
Registration No. 55,593

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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No.: 12/907,488 Confirmation No.: 2088
Applicant(s): Bing *et al.*
Filed: October 19, 2010
Art Unit: 1638
Examiner: Anne R. Kubelik
Title: CORN EVENT DAS-59122-7 AND METHODS FOR DETECTION
THEREOF

Docket No.: 035718/387563
Customer No.: 29122

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

INTERVIEW SUMMARY

Sir:

A telephonic interview in the above-referenced application occurred on July 19, 2013 in which Examiner Anne R. Kubelik and Applicants' undersigned representative, David M. Saravitz, participated. Applicants thank Examiner Kubelik for taking the time to discuss this application with their representative. Applicants provide below a summary of the interview.

The telephonic interview was initiated by Applicants' undersigned representative to discuss the outstanding rejection of claims 2-8 under 35 U.S.C. § 112, first paragraph, for failing to comply with the enablement requirement and the rejection of claim 9 under 35 U.S.C. § 112, first paragraph, for failing to comply with the enablement requirement as set forth in the Office Action mailed May 24, 2013.

First, Applicants' undersigned representative indicated that Applicants intended to cancel claim 9 to obviate the outstanding rejection of this claim under 35 U.S.C. § 112, first paragraph. Then, concerning the rejection of claims 2-8 under 35 U.S.C. § 112, first

paragraph, Applicants' undersigned representative asked Examiner Kubelik if the filing statement or declaration by an attorney of record over his or her signature and registration number, stating that the deposited seeds will be irrevocably and without restriction or condition released to the public upon the issuance of a patent would be sufficient to overcome the rejection of claims 2-8. The Examiner agreed that the filing of such a statement or declaration together with a response to would be sufficient to overcome the rejection of claims 2-8 under 35 U.S.C. § 112, first paragraph, for failing to comply with the enablement rejection. Finally, Applicants' undersigned representative proposed a clarifying amendment to claim 2. The Examiner agreed that this amendment would help clarify the claims and would permit its entry if Applicants submitted such an amendment for her consideration. Applicants agreed to amend claim 2 as they proposed when they file a response to the Office Action.

Examiner Kubelik then suggested an additional amendment to claim 2. In particular, she suggested replacing in the preamble of claim 2, the plural term "parts" with "part". Applicants' undersigned representative indicated that Applicants would consider making this amendment to claim 2 when they file a response to the Office Action.

Appl. No.: 12/907,488
Summary of July 19, 2013 Telephonic Interview

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 C.F.R. § 1.136(a), and any fee required therefor (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 16-0605.

Respectfully submitted,

/david m. saravitz/

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**ELECTRONICALLY FILED USING THE EFS-WEB ELECTRONIC FILING SYSTEM OF THE UNITED STATES
PATENT & TRADEMARK OFFICE ON July 23, 2013.**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re: Bing et al. Confirmation No.: 2088
Appl. No.: 12/907,488 Group Art Unit: 1638
Filed: October 19, 2010 Examiner: Anne R. Kubelik
For: CORN EVENT DAS-59122-7 AND METHODS FOR DETECTION THEREOF

DECLARATION UNDER 37 C.F.R. §1.802

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

The undersigned, David M. Saravitz, declares and states,

1. That he has full and express authority to represent Pioneer Hi-Bred International, Inc., Assignee of Application No.12/907,488, by assignments recorded in the United States Patent and Trademark Office on October 19, 2005, at Reel 016658 and Frame 0251 and on December 9, 2005, at Reel 016876 and Frame 0849.
2. That he has read and understands the above-captioned U.S. Patent Application Number 12/907,488, filed October 19, 2010, for "CORN EVENT DAS-59122-7 AND METHODS FOR DETECTION THEREOF".
3. That the Assignee hereby provides assurance of the permanent availability of the following organisms deposited at The American Type Culture Collection, 10801 University Drive, Manassas, VA 20110-2209, USA:

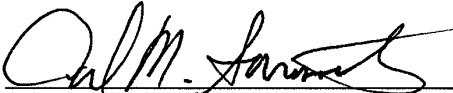
<u>Strain</u>	<u>ATCC Accession No.</u>	<u>Date of Deposit</u>
Hybrid Corn (maize) seed with Event DAS-59122-7	PTA-11384	October 4, 2010

4. That the Assignee hereby provides assurance that the material deposited in paragraph 3, above, is, in each instance, the same biological material specifically identified in the above-captioned patent application, as filed.
5. That the Assignee hereby provides assurance that it will:

In re: Bing et al.
Appl. No.: 12/907,488
Filed: October 19, 2010
For: CORN EVENT DAS-59122-7 AND METHODS FOR DETECTION THEREOF

- a. During the pendency of the patent application, allow access to the deposited PTA-11384 listed in paragraph 3, above, to those persons properly designated by the Commissioner of Patents and Trademarks;
 - b. Replace the deposited PTA-11384 should it die or be destroyed:
 - (1) During the enforceable life of any patent issued out of the above-identified patent application,
 - (2) For five years after the last request for a sample of the deposited PTA-11384, and
 - (3) For thirty years;
 - c. Upon issuance of a patent, irrevocably remove all restrictions of access to the PTA-11384 for the duration of the deposit; and
 - d. Pay the maintenance charges for the duration of the deposit.
6. That all statements made of his own knowledge are true and that all statements made on information and belief are believed to be true; and further acknowledges that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

For: Pioneer Hi-Bred International, Inc.

By: 
David M. Saravitz

Date: 7/19/2013

Register No. 55,593

Electronic Acknowledgement Receipt	
EFS ID:	16387812
Application Number:	12907488
International Application Number:	
Confirmation Number:	2088
Title of Invention:	CORN EVENT DAS-59122-7 AND METHODS FOR DETECTION THEREOF
First Named Inventor/Applicant Name:	JAMES WAYNE BING
Customer Number:	29122
Filer:	David Michael Saravitz/Chianti Lloyd
Filer Authorized By:	David Michael Saravitz
Attorney Docket Number:	035718/387563
Receipt Date:	23-JUL-2013
Filing Date:	19-OCT-2010
Time Stamp:	12:22:14
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		1895D9D_64003_387563_116_Amendment_As_Filed.pdf	16940 f3eb1adc0d1bb36f2454b0566977315573049f80	yes	5

	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Response After Final Action		1	1	
	Amendment Copy Claims/Response to Suggested Claims		2	3	
	Applicant Arguments/Remarks Made in an Amendment		4	5	
Warnings:					
Information:					
2	Applicant summary of interview with examiner	1895D9D_64003_387563_Interview_Summary_As_Filed.pdf	10627 091b21292f7a56f52304b140c5d4c3c1b6114977	no	3
Warnings:					
Information:					
3	Examination support document	387563_1895D9D_64003_Biological_Deposit_Statement_As_Filed.PDF	89204 99c81a96708ebf00dca2f52299def9f802cd3448	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			116771		
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. <u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.					

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875				Application or Docket Number 12/907,488		Filing Date 10/19/2010		☐ To be Mailed						
ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO														
APPLICATION AS FILED – PART I														
(Column 1)		(Column 2)												
FOR		NUMBER FILED		NUMBER EXTRA		RATE (\$)		FEE (\$)						
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))		N/A		N/A		N/A								
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))		N/A		N/A		N/A								
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))		N/A		N/A		N/A								
TOTAL CLAIMS (37 CFR 1.16(i))		minus 20 =		*		X \$ =								
INDEPENDENT CLAIMS (37 CFR 1.16(h))		minus 3 =		*		X \$ =								
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))		If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).												
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))														
* If the difference in column 1 is less than zero, enter "0" in column 2.						TOTAL								
APPLICATION AS AMENDED – PART II														
(Column 1)		(Column 2)		(Column 3)										
AMENDMENT	07/23/2013		CLAIMS REMAINING AFTER AMENDMENT			HIGHEST NUMBER PREVIOUSLY PAID FOR		PRESENT EXTRA		RATE (\$)		ADDITIONAL FEE (\$)		
	Total (37 CFR 1.16(i))		* 8		Minus	** 20		= 0		X \$80 =		0		
	Independent (37 CFR 1.16(h))		* 3		Minus	*** 4		= 0		X \$420 =		0		
	☐ Application Size Fee (37 CFR 1.16(s))													
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))													
	TOTAL ADD'L FEE										0			
(Column 1)		(Column 2)		(Column 3)										
AMENDMENT			CLAIMS REMAINING AFTER AMENDMENT			HIGHEST NUMBER PREVIOUSLY PAID FOR		PRESENT EXTRA		RATE (\$)		ADDITIONAL FEE (\$)		
	Total (37 CFR 1.16(i))		*		Minus	**		=		X \$ =				
	Independent (37 CFR 1.16(h))		*		Minus	***		=		X \$ =				
	☐ Application Size Fee (37 CFR 1.16(s))													
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))													
	TOTAL ADD'L FEE													
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.										LIE /DORIS BURNS/				

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.



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UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/907,488	10/19/2010	JAMES WAYNE BING	035718/387563	2088

29122	7590	07/25/2013
ALSTON & BIRD LLP PIONEER HI-BRED INTERNATIONAL, INC. BANK OF AMERICA PLAZA 101 SOUTH TRYON STREET, SUITE 4000 CHARLOTTE, NC 28280-4000		

EXAMINER	
KUBELIK, ANNE R	

ART UNIT	PAPER NUMBER
1638	

NOTIFICATION DATE	DELIVERY MODE
07/25/2013	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

usptomail@alston.com

<i>Applicant-Initiated Interview Summary</i>	Application No.	Applicant(s)	
	12/907,488	BING ET AL.	
	Examiner	Art Unit	
	ANNE KUBELIK	1638	

All participants (applicant, applicant's representative, PTO personnel):

(1) ANNE KUBELIK. (3) ____.

(2) David Saravitz. (4) ____.

Date of Interview: 19 July 2013.

Type: ☒ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☐ No.
If Yes, brief description: _____.

Issues Discussed ☐ 101 ☒ 112 ☐ 102 ☐ 103 ☐ Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: 2, 9.

Identification of prior art discussed: _____.

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

Applicant will cancel claim 9 and make the appropriate deposit statement. Applicant wish to amend claim 2 to claim a plant comprising the event; the examiner suggested making "parts" in that claim singular..

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☐ Attachment

/Anne R. Kubelik/ Primary Examiner, Art Unit 1638	
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Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record

A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews

Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.

All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:

- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:

- 1) A brief description of the nature of any exhibit shown or any demonstration conducted,
- 2) an identification of the claims discussed,
- 3) an identification of the specific prior art discussed,
- 4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
- 5) a brief identification of the general thrust of the principal arguments presented to the examiner,
(The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
- 6) a general indication of any other pertinent matters discussed, and
- 7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.



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NOTICE OF ALLOWANCE AND FEE(S) DUE

29122 7590 07/31/2013
ALSTON & BIRD LLP
PIONEER HI-BRED INTERNATIONAL, INC.
BANK OF AMERICA PLAZA
101 SOUTH TRYON STREET, SUITE 4000
CHARLOTTE, NC 28280-4000

EXAMINER

KUBELIK, ANNE R

ART UNIT

PAPER NUMBER

1638

DATE MAILED: 07/31/2013

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/907,488	10/19/2010	JAMES WAYNE BING	035718/387563	2088

TITLE OF INVENTION: CORN EVENT DAS-59122-7 AND METHODS FOR DETECTION THEREOF

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$1780	\$300	\$0	\$2080	10/31/2013

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

**Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885**

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

29122 7590 07/31/2013
ALSTON & BIRD LLP
PIONEER HI-BRED INTERNATIONAL, INC.
BANK OF AMERICA PLAZA
101 SOUTH TRYON STREET, SUITE 4000
CHARLOTTE, NC 28280-4000

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/907,488	10/19/2010	JAMES WAYNE BING	035718/387563	2088

TITLE OF INVENTION: CORN EVENT DAS-59122-7 AND METHODS FOR DETECTION THEREOF

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$1780	\$300	\$0	\$2080	10/31/2013

EXAMINER	ART UNIT	CLASS-SUBCLASS
KUBELIK, ANNE R	1638	800-302000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
☐ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (**Please first reapply any previously paid issue fee shown above**)

- ☐ A check is enclosed.
☐ Payment by credit card. Form PTO-2038 is attached.
☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29

☐ Applicant asserting small entity status. See 37 CFR 1.27

☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see form PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____

Date _____

Typed or printed name _____

Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/907,488	10/19/2010	JAMES WAYNE BING	035718/387563	2088

29122	7590	07/31/2013
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101 SOUTH TRYON STREET, SUITE 4000
CHARLOTTE, NC 28280-4000

EXAMINER
KUBELIK, ANNE R

ART UNIT	PAPER NUMBER
1638	

DATE MAILED: 07/31/2013

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 396 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 396 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 12/907,488	Applicant(s) BING ET AL.	
	Examiner ANNE KUBELIK	Art Unit 1638	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to response and amendment filed 07/25/2013.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are 1-8. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

- a) ☐ All b) ☐ Some *c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has **THREE MONTHS FROM THE "MAILING DATE"** of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in **ABANDONMENT** of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ **CORRECTED DRAWINGS** (as "replacement sheets") must be submitted.
☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ **DEPOSIT OF and/or INFORMATION** about the deposit of **BIOLOGICAL MATERIAL** must be submitted. Note the attached Examiner's comment regarding **REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL**.

Attachment(s)

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. ☐ Notice of References Cited (PTO-892) 2. ☐ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____ 3. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material 4. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____ | <ol style="list-style-type: none"> 5. ☐ Examiner's Amendment/Comment 6. ☐ Examiner's Statement of Reasons for Allowance 7. ☐ Other _____ |
|---|--|

/Anne R. Kubelik/
Primary Examiner, Art Unit 1638

Issue Classification 	Application/Control No. 12907488	Applicant(s)/Patent Under Reexamination BING ET AL.
	Examiner ANNE KUBELIK	Art Unit 1638

CPC			Type	Version
Symbol				

CPC Combination Sets				
Symbol	Type	Set	Ranking	Version

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	8	
/ANNE KUBELIK/ Primary Examiner.Art Unit 1638	07/25/2013	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	none

Issue Classification 	Application/Control No. 12907488	Applicant(s)/Patent Under Reexamination BING ET AL.
	Examiner ANNE KUBELIK	Art Unit 1638

US ORIGINAL CLASSIFICATION						INTERNATIONAL CLASSIFICATION										
CLASS			SUBCLASS			CLAIMED					NON-CLAIMED					
800			302			A	0	1	H	5 / 00 (2006.0)						
CROSS REFERENCE(S)						A	0	1	H	5 / 10 (2006.0)						
						A	0	1	H	1 / 00 (2006.0)						
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)					C	1	2	Q	1 / 68 (2006.0)						
800	320.1	260				C	1	2	N	15 / 32 (2006.01.01)						
536	23.71															
435	6.1															
	</															

NONE		Total Claims Allowed:	
		8	
(Assistant Examiner)	(Date)		
/ANNE KUBELIK/ Primary Examiner.Art Unit 1638	07/25/2013	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	none



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BIB DATA SHEET

CONFIRMATION NO. 2088

SERIAL NUMBER	FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.		
12/907,488	10/19/2010	800	1638	035718/387563		
APPLICANTS JAMES WAYNE BING, ANKENY, IA; ROBERT F. CRESSMAN JR., WILMINGTON, DE; MANJU GUPTA, CARMEL, IN; SALIM M. HAKIMI, SACRAMENTO, CA; DAVID HONDRED, ALTOONA, IA; TODD L. KRONE, JOHNSTON, IA; MARY E. HARTNETT LOCKE, MICKLETON, NJ; ABIGAIL K. LUCKRING, WEST CHESTER, PA; SANDRA E. MEYER, DES MOINES, IA; DANIEL MOELLENBECK, GRANGER, IA; KENNETH EDWIN NARVA, ZIONSVILLE, IN; PAUL D. OLSON, KALAHEO, HI; CRAIG D. SANDERS, BEAR, DE; JIMEI WANG, JOHNSTON, IA; JIAN ZHANG, URBANDALE, IA; GAN-YUAN ZHONG, URBANDALE, IA;						
** CONTINUING DATA ***** This application is a DIV of 11/938,483 11/12/2007 which is a DIV of 11/237,222 09/28/2005 PAT 7323556 which claims benefit of 60/614,225 09/29/2004						
** FOREIGN APPLICATIONS *****						
** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** 10/26/2010						
Foreign Priority claimed ☐ Yes ☒ No 35 USC 119(a-d) conditions met ☐ Yes ☐ No Verified and /ANNE R KUBELIK/ Acknowledged Examiner's Signature		☐ Met after Allowance Initials	STATE OR COUNTRY IA	SHEETS DRAWINGS 7	TOTAL CLAIMS 9	INDEPENDENT CLAIMS 4
ADDRESS ALSTON & BIRD LLP PIONEER HI-BRED INTERNATIONAL, INC. BANK OF AMERICA PLAZA 101 SOUTH TRYON STREET, SUITE 4000 CHARLOTTE, NC 28280-4000 UNITED STATES						
TITLE CORN EVENT DAS-59122-7 AND METHODS FOR DETECTION THEREOF						
FEES: Authority has been given in Paper			☐ All Fees ☐ 1.16 Fees (Filing)			

<i>Search Notes</i> 	Application/Control No. 12907488	Applicant(s)/Patent Under Reexamination BING ET AL.
	Examiner ANNE KUBELIK	Art Unit 1638

CPC- SEARCHED		
Symbol	Date	Examiner

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
SEQ ID NO:33 and 35	1/3/13	ark

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
	SEQ ID NO:33, 35	4/17/13	ark

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OK TO ENTER: /A.K./

07/25/2013

PATENT

**RESPONSE UNDER 37 C.F.R. 1.116 - EXPEDITED
PROCEDURE - EXAMINING GROUP 1638**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No.: 12/907,488 Confirmation No.: 2088
Applicant(s): Bing *et al.*
Filed: October 19, 2010
Art Unit: 1638
Examiner: Anne R. Kubelik
Title: CORN EVENT DAS-59122-7 AND METHODS FOR DETECTION
THEREOF

Docket No.: 035718/387563
Customer No.: 29122

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT AFTER FINAL UNDER 37 C.F.R. § 1.116

Sir:

In response to the Final Office Action dated May 24, 2013, please amend the above-identified application as follows:

Amendments to the Claims are reflected in the listing of claims beginning on page 2 of this paper.

Remarks/Arguments begin on page 4 of this paper.

Doc Code: PET.AUTO Document Description: Petition automatically granted by EFS-Web		PTO/SB/83 U.S. Patent and Trademark Office Department of Commerce
Electronic Petition Request	REQUEST FOR WITHDRAWAL AS ATTORNEY OR AGENT AND CHANGE OF CORRESPONDENCE ADDRESS	
Application Number	12907488	
Filing Date	19-Oct-2010	
First Named Inventor	JAMES BING	
Art Unit	1638	
Examiner Name	ANNE KUBELIK	
Attorney Docket Number	035718/387563	
Title	CORN EVENT DAS-59122-7 AND METHODS FOR DETECTION THEREOF	
☒ Please withdraw me as attorney or agent for the above identified patent application and the practitioners of record associated with Customer Number: <u>29122</u>		
The reason(s) for this request are those described in 37 CFR: 11.116(a)(3)		
Certifications		
☒ I/We have given reasonable notice to the client, prior to the expiration of the response period, that the practitioner(s) intend to withdraw from employment		
☒ I/We have delivered to the client or a duly authorized representative of the client all papers and property (including funds) to which the client is entitled		
☒ I/We have notified the client of any responses that may be due and the time frame within which the client must respond		
Change the correspondence address and direct all future correspondence to the first named inventor or assignee that has properly made itself of record pursuant to 37 CFR 3.71 (for applications filed before September 16, 2012) or the applicant (for applications filed on or after September 16, 2012):		
Name	PIONEER HI-BRED INTERNATIONAL, INC.	
Address	7100 NW 62nd Avenue P.O. Box 1014	
City	Johnston	
State	IA	
Postal Code	50131-1014	
Country	US	

I am authorized to sign on behalf of myself and all withdrawing practitioners.	
Signature	/w. murray spruill/
Name	W. Murray Spruill
Registration Number	32943



UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

Decision Date : August 28, 2013

In re Application of :

JAMES BING

Application No : 12907488

Filed : 19-Oct-2010

Attorney Docket No : 035718/387563

DECISION ON REQUEST TO WITHDRAW AS
ATTORNEY/AGENT OF RECORD

This is an electronic decision on the Request to Withdraw as attorney or agent of record under 37 CFR § 1.36(b), filed August 28, 2013

The request is **APPROVED**.

The request was signed by W. Murray Spruill (registration no. 32943) on behalf of all attorneys/agents associated with Customer Number 29122 . All attorneys/agents associated with Customer Number 29122 have been withdrawn.

Since there are no remaining attorneys of record, all future communications from the Office will be directed to the first named inventor or assignee that has properly made itself of record pursuant to 37 CFR 3.71 (for applications filed before September 16, 2012) or the applicant (for applications filed on or after September 16, 2012), with correspondence address:

Name	PIONEER HI-BRED INTERNATIONAL, INC.
Name2	
Address 1	7100 NW 62nd Avenue
Address 2	P.O. Box 1014
City	Johnston
State	IA
Postal Code	50131-1014
Country	US

As a reminder, requester is required to inform the first named inventor or assignee that has properly made itself of record pursuant to 37 CFR 3.71 (for applications filed before September 16, 2012) or the applicant (for applications filed on or after September 16, 2012) of the electronically processed petition.

Telephone inquiries concerning this decision should be directed to the Patent Electronic Business Center (EBC) at 866-217-9197.

Office of Petitions

Electronic Acknowledgement Receipt	
EFS ID:	16696802
Application Number:	12907488
International Application Number:	
Confirmation Number:	2088
Title of Invention:	CORN EVENT DAS-59122-7 AND METHODS FOR DETECTION THEREOF
First Named Inventor/Applicant Name:	JAMES WAYNE BING
Customer Number:	29122
Filer:	David Michael Saravitz/Evelyn Casey
Filer Authorized By:	David Michael Saravitz
Attorney Docket Number:	035718/387563
Receipt Date:	28-AUG-2013
Filing Date:	19-OCT-2010
Time Stamp:	10:03:09
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no				
File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Petition automatically granted by EFS	petition-request.pdf	34834 55e95c604fe553f6bc15e1d0ce88cfec87a74333	no	2
Warnings:					
Information:					

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.



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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/907,488	10/19/2010	JAMES WAYNE BING	035718/387563

CONFIRMATION NO. 2088

POWER OF ATTORNEY NOTICE

29122
ALSTON & BIRD LLP
PIONEER HI-BRED INTERNATIONAL, INC.
BANK OF AMERICA PLAZA
101 SOUTH TRYON STREET, SUITE 4000
CHARLOTTE, NC 28280-4000



Date Mailed: 08/29/2013

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 08/28/2013.

- The withdrawal as attorney in this application has been accepted. Future correspondence will be mailed to the new address of record. 37 CFR 1.33.

/eefswuser/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101



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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/907,488	10/19/2010	JAMES WAYNE BING	035718/387563	2088

7590 09/10/2013
PIONEER HI-BRED INTERNATIONAL, INC.
7100 NW 62nd Avenue
P.O. Box 1014
Johnston, IA 50131-1014

EXAMINER

KUBELIK, ANNE R

ART UNIT	PAPER NUMBER
----------	--------------

1638

MAIL DATE	DELIVERY MODE
-----------	---------------

09/10/2013

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.



UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

Application No. : 12907488
Applicant : Bing
Filing Date : 10/19/2010
Date Mailed : 09/10/2013

NOTICE TO FILE CORRECTED APPLICATION PAPERS

Notice of Allowance Mailed

This application has been accorded an Allowance Date and is being prepared for issuance. The application, however, is incomplete for the reasons below.

Applicant is given 2 month(s) from the mail date of this Notice, or the time remaining from the Notice of Allowance and Fee(s) Due, whichever is longer, within which to respond.

The informalities requiring correction are indicated in the attachment(s). If the informality pertains to the abstract, specification (including claims) or drawings, the informality must be corrected with an amendment in compliance with 37 CFR 1.121 (or, if the application is a reissue application, 37 CFR 1.173). Such an amendment may be filed after payment of the issue fee if limited to correction of informalities noted herein. See Waiver of 37 CFR 1.312 for Documents Required by the Office of Patent Publication, 1280 Off. Gaz. Patent Office 918 (March 23, 2004). In addition, if the informality is not corrected until after payment of the issue fee, for purposes of 35 U.S.C. 154(b)(1)(iv), "all outstanding requirements" will be considered to have been satisfied when the informality has been corrected. A failure to respond within the above-identified time period will result in the application being ABANDONED. **This period for reply is NOT extendable under 37 CFR 1.136(a).**

See attachment(s).

*A copy of this notice **MUST** be returned with the reply. Please address response to "Mail Stop Issue Fee, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450".*

/Carlota Erana/
Publication Branch
Office of Data Management
(571) 272-4200

Application No. 12907488

Drawings filed: 10/19/2010

**DRAWINGS AND BRIEF DESCRIPTION OF DRAWINGS
IN NON-COMPLIANCE WITH 37 CFR 1.84(u)(1)**

37 CFR 1.84(u)(1) states, "The different views must be numbered in consecutive Arabic numerals, starting with 1 ... Partial views intended to form one complete view, on one or several sheets, must be identified by the same number followed by a capital letter. View numbers must be preceded by the abbreviation 'FIG.' "

Other methods of identification are improper, including Roman numerals (FIG. I, FIG. II, etc.) and alphabetic characters (FIG. A, FIG. B, etc.). Abbreviations and words other than "FIG." ("Illustration, 1" "Diagram 2," "Photo 3," etc.) are improper.

- ☐ Applicant must submit drawings that number the views using consecutive Arabic numerals.
- ☐ Applicant must amend the brief description of the drawings on Page(s) of the specification to show consecutive Arabic numerals.

NOTE: Applicant is advised that the detailed description may voluntarily be amended to identify the drawings by Arabic numerals.

- ☒ The drawing is continued onto a second page (or more) without proper labeling under 37 CFR 1.84(u)(1). FIG(s) 1 to 3
- ☐ Applicant must submit drawings on which the view numbers are preceded by the abbreviation "FIG."
- ☐ Applicant must amend the brief description of the drawings on Page(s) of the specification to show view numbers preceded by the abbreviation "FIG."

NOTE: Applicant is advised that the detailed description may voluntarily be amended to show view numbers preceded by the abbreviation "FIG."

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of	)	
	)	
BING et al.	)	Art Unit: 1638
	)	
Application No.: 12/907,488	)	Examiner: Anne R. Kubelik
	)	
Filing Date: October 19, 2010	)	Confirmation No.: 2088
	)	
FOR: CORN EVENT DAS-59122-7 AND	)	
METHODS FOR DETECTION THEREOF	)	

RESPONSE TO NOTICE TO FILE CORRECTED APPLICATION PAPERS

Mail Stop ISSUE FEE

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Ballard Spahr LLP
Customer Number 23859

September 26, 2013

Sir:

In response to the "Notice to File Corrected Application Papers" mailed September 10, 2013, in connection with the above-identified patent application, Applicant encloses Replacement Drawings (7 pages). As required, also enclosed is a copy of the Notice to File Corrected Application Papers.

It is believed that no fees are due at this time; however, the Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 14-0629.

Respectfully submitted,

/Mary Anthony Merchant, Reg. No. 39,771/
Mary Anthony Merchant, J.D., Ph.D.
Registration No. 39,771

Ballard Spahr LLP
Customer Number 23859
(678) 420-9300 Phone
(678) 420-9301 Fax

1515120

In accordance with 37 C.F.R. § 1.8, I certify that this correspondence is being transmitted to the Commissioner for Patents, Mail Stop Amendment, P.O. Box 1450, Alexandria, VA 22313-1450 via the USPTO's EFS-Web Electronic Filing System on **September 26, 2013**

/Mary Anthony Merchant, Reg. No. 39,771/
Mary Anthony Merchant, J.D., Ph.D. – Reg. No. 39,771

Replacment Sheet

1/7

FIG. 1

```

1   CTGAGCGCAC AACAGCGAGT CGCATGGGCAC CGGACGACAT GAGCGAGATT
51  TAGATCGGAG GGTGGCGACA TGGGGCAACC TGCGCAGCTA ACGCAGGGAT
101 CCACACGACC ACCAACGAAG CCAAGCCCCG GCACGTCCCC AGGCAGTTG
151 GGGCCCTGGTT CCACCACCGG ATGCATGCAG TGAAGCGGGG ACGGAGAGAC
201 AAGCCCGAGG CGCGGGTGGG AATGGCGTCC GGGAGGACGA GTGGAGGAGA
251 AGAATCTAGA GGCATCGAGA TTCGAGAAGC CGACGGAGAC AAGATTCTGT
301 TGGGGGGAGA CAAACCGCGG GGCTGAGCGC CGTTGATATG GGATCAGACG
351 CTGTGGATAA AAAAAGTGAC GTTGATAGAA CGTCTGGCCA GTGAAAAAAC
401 AAAACAACTC CAACAAAATA CTTTAAAGC TCTTATACCC TAAATGTAGG
451 GGATCAACA CGTCTCTACA CTATTTAGCA GCGTCTCTA ATGATCCTC
501 TAAATTTAGA GAACGCTACT AGATTCTCTA TATATAGTTT CTCTAAACGA
551 TCTTTTATCC ATTTAAATAC TTTAAATAAC CGGTTTAAAC AAATAAAAT
601 ATATACAATA CATTGAGAG TATGACAAAT ACGTATGTAT AAAATAAAA
651 AATAAAATAA TGTATTAGTC TACTTTGAAT CTTCTTTTCT TCATAATATA
701 ATGATGTATA GCTCTCATGT GCGTTGAGAA AAAAGTTAGA GCTAGACGTT
751 TAATGTGTAG TGACAGTCTT CGACGAAATC TCCCTAATGA GATGAATTAC
801 TGGAGGTTCC ATCAGAAAGT CCCCTGAAA GAGGCATTTA TTTAGTTTAG
851 TCAGCAATTT CTGGGAACAC AATATTTCTT TTGTTATCAC CACTATTAAA
901 AATCTATGGT TATAACTTAT AATAACATGA AAAAATAATT TAGCATCCCA
951 TATATATAAA AACTGAAGGA AGCCATATAT ACTAACATAA GTTAGGAGAA
1001 ACTAAGAAGG TTGTGCAAGG CTGCACTGCG TCCAAATAC TGCAACAAC
1051 CACTCTCCTC TACCACCAA AGAAACTCAT GTACTCCCTC CGTTCTTTT
1101 TATTTGTGCG ATTTTAGTTT AAAAATGAAC TAGCAGTCCA CAATATTTCC
1151 AGAACAGATA TAGTATATAC TAACATAACT TAGGAGATAC TAAGAAAGTT
1201 GCGCAGAGCT TTCACTGTTT CAAATTACTG CAAAGCCTCT CCCCTCTGCC
1251 AGTACATCTA CGAGATGTTT CAGTTAAACA AAGATTCAGA CAAGTGATGA
1301 GCCACTTCTT GTCATAGATT GTGTGGTCAA CCAACCCATT GATGCCACGG
1351 TTTTGTGCA TCCATGCTTT TGTATTAAA CATCAGTTAT GTTACCATG
1401 TCCGATATGC TCTACATAAT GACAATCAAC TTGGTGTICA TTATATTAC
1451 AATGTTAGGA ATTTCAATAG CTACGAACAC TTCAATAGAA GTGCCTTTGT
1501 GGGATCACCT TAATGTGTTG TTGATGTAGG GAGAGAATC TTAATTTACT
1551 CTGCTAAAT TTGAATACA CAAACCACT GCCTGAGGA TTGCTCTAAT
1601 AATTAAGTGC TCATACACGT TAGCATCTGT TCAGATACTG AGCTAATCCC
1651 TAGGATTAAA GGATTTGTA AAGATATGCC CAATCATTTA TTTAGTTTAT
1701 TTATTTCTTA GTTATCCACT TGAAGATTTA CATACATTTG AAATAAATTT
1751 CTTAGAGGTA AAGTGAANA CAGTTATTTA AATACATTTT AGTTATTTAT
1801 TTCTTTCTTT TTCTTAATTT TTCTTTGTAT TTGAAGTCTG AAAAGATAAC
1851 TTTGCCCTTA TACATATTTT ATCTTCTACG TACGCATCTG AACAACGCT
1901 CTTTGTCCCC TGATCGTCCA GCAATTAGTG CTATGAATCG CGTTAAGCG
1951 CTGCAAAATC ATGGCTGGGG CTTGCTCCTC GAGTCGTCTT GCTGCTCGAT
2001 GTCACCTCGA GTCCCGCACC GACCTCAGTG CTTGTTCTTG TTGGAGCCAC
2051 CTCTCTCGA CGATCGCCAA AGACGGATAA GGCCGAAGCC GTCACCTCAG
2101 ACCGCGCTCA TGCGCGGTAG CAGACTCCTA CATAGCAGGG CCAGGGTATG
2151 TGGACCTTGG CAAGTTTAGG ATTGGAACCA GCGACAGAA TCCACAAGAT
2201 TGGAGCAAA GACCAAAAT TCACAAGGAT TGGCGGCTGA CATTGCCAGC
2251 GCGGGATCGC ATGCGCGCGG GCGGGCGGG GCGAGCACGG GAGCAGGCGA
2301 CAGTCGAGCT CCATTGGAAC GTAGAAATAC TTAAGGGCAA GGTCTCCAA
2351 TACTTGAAA AATAGAAAA AGAAGAAAT ACATGAAATG ATATTGAAT
2401 CAATTGGAAG ATGTTATGAA TCTTGTTTT GCAAGCGAA CGATTAGAT
2451 GGCAAAATA TGAATCTTTT TGTTTGAAGT CCAAAATATA AATTTTCTC
2501 GTACTACCA ACATGGGTGC GCACCTGTA TTGGCTCATA AAAATCTTG
2551 GAGGGACGGA AGAAAGAGTG AAGGGATAG CAAGTAAAG CGCTCAACA
2601 CTGATAGTTT AAATGAAGG CGGGAACGA CAATCTGATC ATGAGCGGAG

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FIG. 1 continued

2651	AATTAAGGGA	GTCACGTTAT	GACCCCCGCC	GATGACGCGG	GACAAGCCGT
2701	TTTACGTTTG	GAAC TGACAG	AACCGCAACG	TTGAAGGAGC	CACTCAGCAA
2751	GCTTACTAGT	AGCGCTGTTT	AAACGCTCTT	CAACTGGAAG	AGCGGTTACC
2801	CGGACCGAAG	CTTGCA TGCC	TGCAGTGCCAG	CGTGACCCGG	TGCTGCCCCF
2851	CTCTAGAGAT	AATGAGCATT	GCATGTCTAA	GTTATAAAAA	ATTACCACAT
2901	ATTTTTTTTG	TCACACTTGT	TTGAAGTGCA	GTTTATCTAT	CTTTATACAT
2951	ATATTTAAAC	TTTACTCTAC	GAATAATATA	ATCTATAGTA	CTACAATAAT
3001	ATCAGTGTTT	TAGAGAATCA	TATAAATGAA	CAGTTAGACA	TGGTCTAAAG
3051	GACAATTGAG	TATTTTGACA	ACAGGACTCT	ACAGTTTAT	CTTTTASTG
3101	TGCATGTGTT	CTCCTTTTTT	TTTGCAATA	GCTTCACCTA	TATAATACTT
3151	CATCCATTTT	ATTAGTACAT	CCATTTAGGG	TTTAGGGTTA	ATGGTTTTTA
3201	TAGACTAATT	TTTTTAGTAC	ATCTATTTTA	TTCTATTTTA	GCCTCTAAAT
3251	TAAGAAAAC	AAAACCTAT	TTTAGTTTTT	TTATTAAATA	ATTTAGATAT
3301	AAAATAGAA	AAAATAAAGT	GACTAAAAAT	TAAACAATA	CCCTTTAAGA
3351	AATTAATAAA	ACTAAGGAAA	CATTTTTCTT	GTTTCGAGTA	GATAATGCCA
3401	GCCTGTTAAA	CGCCGTCGAC	GAGTCTAACG	GACACCAACC	AGCGAACCCAG
3451	CAGCGTCGCG	TCGGGCCAAG	CBAAGCAGAC	GGCAGGCCAT	CTCTGTCGCT
3501	GCCTCTGGAC	CCCTCTCGAG	AGTTCGGCTC	CACCGTTGGA	CTTGCTCCGC
3551	TGTCGGCATC	CAGAAATTGC	GTGGCGGAGC	GGCAGACGTG	AGCCGGCACC
3601	GCAGGCGGCC	TCCCTCTCCT	CTCAGGGCAC	CGGCAGCTAC	GGGGGATTCC
3651	TTTCCCACCG	CTCCTTGCT	TTCCCTTCCT	CGCCCGCCGT	AATAAATAGA
3701	CACCCCTCC	ACACCTCTT	TCCCAACCT	CGTGTGTTT	GGAGCGCACA
3751	CACACACAAC	CAGATCTCCC	CCAAATCCAC	CCGTCCGCAC	CTCCGCTTCA
3801	AGGTACGCCG	CTCGTCTCC	CCCCCCCCC	CTCTCTACCT	TCTCTAGATC
3851	GGCGTTCCGG	TCCATGGTTA	GGGCCCGGTA	GTTCTACTTC	TGTTCTATGT
3901	TGTGTTAGAT	CCGTGTTTGT	GTTAGATCCG	TGCTGCTAGC	GTTCTGTACAC
3951	GGATGCGACC	TGTACGTCAG	ACACGTTCTG	ATTGCTAACT	TGCCAGTGTT
4001	TCTCTTTGGG	GAATCCTGGG	ATGGCTCTAG	CCGTTCGCCA	GACGGGATCG
4051	ATTTCTATGAT	TTTTTTTGT	TCGTTGCATA	GGGTTTGGTT	TGCCCTTTTC
4101	CTTTATTTCA	ATATAEGCCG	TGCACTTGTT	TGTCGGGTCA	TCTTTTCATG
4151	CTTTTTTTTG	TCTTGCTTGT	GATGATGTGG	TCTGCTTGGG	CGTCTGTTCT
4201	AGATCGGAGT	AGAATTCTGT	TTCAAACCTAC	CTGGTGGATT	TATTAATTTT
4251	GGATCTGTAT	GTGTGTGCCA	TACATATTCA	TAGTTACGAA	TTGAAGATGA
4301	TGGATGGAAA	TATCGATCTA	GGATAGGTAT	ACATGTTGAT	GGGGGTTTTA
4351	CTGATGCATA	TACAGAGATG	CTTTTGTTC	GCTTGGTTGT	GATGATGTGG
4401	TGTGTTGGG	CGGTCGTTCA	TTGTTCTAG	ATCGGAGTAG	AATACTGTTT
4451	CAAACTACCT	GGTGATTTA	TTAATTTTGG	AACGTATGT	GTGTGTCATA
4501	CATCTTCATA	GTTACGAGTT	TAAGATGGAT	GGAAATATCG	ATGTAGGATA
4551	GGTATACATG	TTGATGTGGG	TTTACTGAT	GCATATACAT	GATGGCATA
4601	GCAGCATCTA	TTCATATGCT	CTAACCTTGA	GTACCTATCT	ATTATAATAA
4651	ACAAGTATGT	TTTATAATTA	TTTTGATCTT	GATATACTTG	GATGATGGCA
4701	TATGCAGCAG	CTATATGTGG	ATTTTTTTAG	CCCTGCCTTC	ATACGCTATT
4751	TATTTGCTTG	GTACTGTTTC	TTTTGTGAT	GCTCACCCCTG	TTGTTTGGTG
4801	TTACTTCTGC	AGGTGACTC	TAGAGGATCC	ACACGACACC	ATGTCGCCCC
4851	GCGAGGTGCA	CATCGACGTG	AACAACAAGA	CCGGCCACAC	CCTCCAGCTG
4901	GAGGACAAGA	CCAAGCTCGA	CGGCGGCAGG	TGGCGCACCT	CCCCGACCAA
4951	CGTGGCCAAC	GACCAGATCA	AGACCTTCGT	GGCCGAATCC	AACGGCTTCA
5001	TGACCGGCAC	CGAGGGCACC	ATCTACTACT	CAATTAATGG	CGAGGCCGAG
5051	ATCAGCCTCT	ACTTCGACAA	CCCGTTCCGC	GGCTCCAACA	AATACGACGG
5101	CCACTCCAAC	AAGTCCAGT	ACGAGATCAT	CACCCAGGGC	GGCTCCGGCA
5151	ACCACTCCCA	CGTGACCTAC	ACCATCCAGA	CCACCTCCTC	CCGCTACGGC
5201	CACAAGTCC	GAGTCATGAG	TCATGAGTCA	GTTAACCTAG	ACTTGTCCAT
5251	CTTCTGGATT	GGCCAACTTA	ATTAATGTAT	GAAATAAAAG	GATGCACACA

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FIG. 1 continued

5301	TAGTGACATG	CTAATCACTA	TAATGTGGGC	ATCAAAGTTG	TGTGTTATGT
5351	GTAATTACTA	GTTATCTGAA	TAAAAGAGAA	AGAGATCATC	CATATTTCTT
5401	ATCCTAAATG	AATGTCACGT	GTCTTTATAA	TTCTTTGATG	AACCAGATGC
5451	ATTTCAATTAA	CCAAATCCAT	ATACATATAA	ATATTAATCA	TATATAATTA
5501	ATATCAATTG	GGTTAGCAAA	ACAAATCTAG	TCTAGGTGTG	TTTTGCGAAT
5551	GCGGCCGCGG	ACCGAATTGG	GGATCTGCAT	GAAAGAAACT	GTGCGACTGC
5601	TGAACCGCAC	CTTGTCACCT	TCATCGAACA	CGACCTGTGC	CCAAGATGAC
5651	GGTGCTGCGG	TCTAAGTGAG	GCTGAATTGC	CTTGGACAGA	AGCGGACTCC
5701	CTACAATTAG	TTAGGCCAAA	CGGTGCATCC	ATGTGTAGCT	CCGGGCTCGG
5751	GCTGTATCGC	CATCTGCAT	AGCATCCATG	GAGCTCGTTC	CATGTAGTTG
5801	GAGATGAACC	AATGATCGGG	CGTGTGGACG	TATGTTCTTG	TGTACTCCGA
5851	TAGTAGAGTA	CGTGTAGCT	CTTTCATGGT	GCAAGTGAAA	TTTGTGTTGG
5901	TTTAATTACC	CCTACGTTAG	TTGCGGGACA	GGAGACACAT	CATGAATTTA
5951	AAGGCGATGA	TGTCCTCTCC	TGTAATGTTA	TTCTTTTGAT	GTGATGAATC
6001	AAAATGTCT	ATAAAACATT	TGTTGCTCTT	TAGTTAGGCC	TGATCGTAGA
6051	ACGAAATGCT	CGTGTAGCGG	GGCTACGAGC	CTATGACGCA	ATAACACTGG
6101	TTTGCCGGCC	CGGAGTCGCT	TGACAAAAAA	AAGCATGTTA	AGTTTATTTA
6151	CAATTCAAAA	CCTAACATAT	TATATTCCCT	CAAAGCAGGT	TCACGATCAC
6201	ACCTGTACCT	AAAAAAAACA	TGAAGAATAT	ATTACTCCAT	TATTATGAGA
6251	TGAACCACTT	GGCAAGAGTG	GTAAGCTATA	TAAAAAATG	AACATTATTA
6301	CGAGATGTTA	TATGCCATTA	TATTGATTGG	AAGATATATG	TTTCTTTCTC
6351	CCACGGGCAC	CTACCGGATA	CATGATAAGG	CCAAGGCAGA	TCACGGGAAA
6401	TTATTCCGAAT	ACATGTTACG	COCTATTGCC	GGAAAAAATA	TGCAGGGCAG
6451	GTGTTGGCCG	TAGCGATTTA	AGCACTTAAG	CTGGAGGTTG	CCACACTTGG
6501	ATGCAAGCGT	CTGACCCCTC	TAAAACATCG	GCGGCTTTGT	CCGTATCCGT
6551	ATCCCTATC	CGACATCTAG	CTGGCCACAC	GACGGGGCTG	GGCAGATCGT
6601	GGATGCCGGG	TGGACGTCGA	TCGTCAGCCA	TCATAGACCA	ATCGACCATC
6651	TGTTATGGAT	GCTTGCTAGC	TAGACTAGTC	AGACATAAAA	TTTGGATACT
6701	TTCTCCCAAC	TGGGAGACGG	GGACTGATGT	GCAGCTGCAC	GTGAGCTAAA
6751	TTTTTCCCTA	TAAATATGCA	TGAAATACTG	CATTATCTTG	CCACAGCCAC
6801	TGCCACAGCC	AGATAACAAG	TGCAGCTGGT	AGCACGCAAC	GCATAGCTCT
6851	GGACTTGTAG	CTAGGTAGCC	AACCGGATCC	ACACGACACC	ATGCTCGACA
6901	CCAACAAGGT	GTACGAGATC	AGCAACCACG	CCAACGGCCT	CTACGCCGCC
6951	ACCTACCTCT	CCCTCGACGA	CTCCGGCGTG	TCCCTCATGA	ACAAGAACGA
7001	CGACGACATC	GACGACTACA	ACCTCAAGTG	GTTCTCTTTC	CCGATCGACG
7051	ACGACCACTA	CATCATCACC	TCCTACGCCG	CCAACAACCTG	CAAGGTGTGG
7101	AACGTGAACA	ACGACAAGAT	TAATGTGTCA	ACCTACTCCT	CCACCAACTC
7151	CATCCAGAAG	TGGCAGATCA	AGGCCAACGG	CTCCTCCTAC	GTGATCCAGT
7201	CCGACAAACG	CAAGGTGCTC	ACCGCCGGCA	CCGGCCAGGC	CCTCGGCCCTC
7251	ATCCGCCCTA	CCGACGAGTC	CTCCAACAAC	CCGAACCAGC	AATGGAACCT
7301	GACGTCCGTG	CAGACCATCC	AGCTCCCGCA	GAAGCCGATC	ATCGACACCA
7351	AGCTCAAGGA	CTACCCGAAG	TACTCCCCGA	CCGGCAACAT	CGACAACGGC
7401	ACCTCCCCGC	AGCTCATGGG	CTGGACCCCTC	GTGCCGTGCA	TCATGGTGAA
7451	CGACCCGAAC	ATCGACAAGA	ACACCCAGAT	CAAGACCACC	CCGTACTACA
7501	TCCTCAAGAA	GTACCACTAC	TGGCAGAGGG	CCGTGGGCTC	CAACGTCGCG
7551	CTCCGCCCGC	ACGAGAAGAA	GTCCTACACC	TACGAGTGGG	GCACCGAGAT
7601	CGACCAAGAA	ACCACCATCA	TCAACACCCCT	CGGCTTCCAG	ATCAACATCG
7651	ACAGCGGCAT	GAAGTTCGAC	ATCCCGGAGG	TGGGCGGCGG	TACCGACGAG
7701	ATCAAGACCC	AGCTCAACGA	GGAGCTCAAG	ATCGAGTATT	CACATGAGAC
7751	GAAGATCATG	GAGAAGTACC	AGGAGCAGTC	CGAGATCGAC	AACCCGACCG
7801	ACCACTCCAT	GAAGTTCGAC	GGCTTCTCTA	CCATCACCTC	CCTGGAGCTC
7851	TACCGCTACA	ACGGCTCCGA	GATCCGCATC	ATGCAGATCC	AGACCTCCGA
7901	CAACGACACC	TACAACGTGA	CCTCTTACCC	GAACCAACAG	CAGGCCCTGC

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FIG. 1 continued

7951	TGCTGCTGAC	CAACCACTCC	TACGAGGAGG	TGGAGGAGAT	CACCAACATC
8001	CCGAAGTCCA	CCCTCAAGAA	GCTCAAGAAG	TACTACTTCT	GAGTCATGAG
8051	TCATGAGTCA	GTTAACCTAG	ACTTGTCAT	CTTCTGGATT	GGCCAACCTTA
8101	ATTAATGTAT	GAAATAAAAG	GATGCACACA	TAGTGACATG	CTAATCACTA
8151	TAATGTGGGC	ATCAAAGTTG	TGTGTTATGT	GTAATTACTA	GTTATCTGAA
8201	TAAAAGAGAA	AGAGATCATC	CATATTTCTT	ATCCTAAATG	AATGTCACGT
8251	GTCTTTATAA	TTCTTTGATG	AACCAGATGC	ATTTCAATTAA	CCAAATCCAT
8301	ATACATATAA	ATATTAATCA	TATATAATTA	ATATCAATTG	GGTTAGCAAA
8351	ACAAATCTAG	TCTAGGTGTG	TTTTGCCAAT	TCCCATGGAG	TCAAAGATTTC
8401	AAATAGAGGA	CCTAACAGAA	CTCGCCGTAA	AGACTGGCGA	ACAGTTCATA
8451	CAGAGTCTCT	TACGACTCAA	TGACAAGAAG	AAATCTTTCG	TCAACATGGT
8501	GGAGCACGAC	ACGCTTGTCT	ACTCCAAAAA	TATCAAAGAT	ACAGTCTCAG
8551	AAGACCAAAG	GGCAATTGAG	ACTTTTCAAC	AAAGGGTAAT	ATCCGGAAAC
8601	CTCCTCGGAT	TCCATTGCCC	AGCTATCTGT	CACTTTATTG	TGAAGATAGT
8651	GGAAAAGGAA	GGTGGCTCCT	ACAAATGCCA	TCATTGCGAT	AAAGGAAAGG
8701	CCATCGTTGA	AGATGCCTCT	GCCGACAGTG	GTCCCAAAGA	TGGACCCCCA
8751	CCCACGAGGA	GCATCGTGGA	AAAAGAAGAC	GTTCCAACCA	CGTCTTCAAA
8801	GCAAGTGGAT	TGATGTGATA	TCTCCACTGA	CGTAAGGGAT	GACGCACAAAT
8851	CCCACTATCC	TTCCGCAAGAC	CCTTCCTCTA	TATAAGGAAG	TTCAATTTCAAT
8901	TTGGAGAGGA	CAGGGTACCC	GGGGATCCAC	CATGCTCCG	GAGAGGAGAC
8951	CAGTTGAGAT	TAGGCCAGCT	ACAGCAGCTG	ATATGCCCGC	GGTTTGTGAT
9001	ATCGTTAACC	ATTACATTGA	GACGTCTACA	GTGAACCTTA	GGACAGAGCC
9051	ACAAACACCA	CAAGAGTGGA	TTGATGATCT	AGAGAGGTTG	CAAGATAGAT
9101	ACCCCTTGGT	GGTTGCTGAG	GTTGAGGGTG	TTGTGGCTGG	TATTGCTTAC
9151	GCTGGGCCCT	GGAAGGCTAG	GAAAGCTTAC	GATTGGACAG	TTGAGAGTAC
9201	TGTTTACGTG	TCACATAGGC	ATCAAAGGTT	GGGCCTAGGA	TCCACATTGT
9251	ACACACATTT	GCTTAAGTCT	ATGGAGGGCG	AAGGTTTTAA	GTCTGTGGTT
9301	GCTGTTATAG	GCCTTCCAAA	CGATCCATCT	GTTAGGTTGC	ATGAGGCTTT
9351	GGGATACACA	GCCCCGGGTA	CATTGCGCGC	AGCTGGATAC	AAGCATGGTG
9401	GATGGCATGA	TGTTGGTTTT	TGGCAAGGGG	ATTTTGAGTT	GCCAGCTCCT
9451	CCAAGGCCAG	TTAGGCCAGT	TACCCAGATC	TGAGTCGACC	TGCAGGCATG
9501	CCCGCTGAAA	TCACAGTCT	CTCTCTACAA	ATCTATCTCT	CTCTATAATA
9551	ATGTGTGAGT	AGTTCCCAAG	TAAGGGAATT	AGGGTCTCTA	TAGGGTTTCG
9601	CTCATGTGTT	GAGCATATAA	GAAACCCTTA	GTATGTATTT	GTATTTGTAA
9651	AATACTTCTA	TCAATAAAAT	TTCTAATTCC	TAAAACCAAA	ATCCAGGGCG
9701	AGCTCGGTAC	CCGGGGATCC	TCTAGAGTCG	ACCTGCAGGC	ATGCCCCGCG
9751	ATATCGATGG	GCCCCGGCCG	AAGCTTCGGT	CCGGGCCATC	GTGGCCTCTT
9801	GCTCTTCAGG	ATGAAGAGCT	ATGTTTAAAC	GTGCAAGCGC	TCAATTCGGC
9851	CTATAGTGAG	TCGTATTACA	ATCGTACGCA	ATTCACTACA	TTAAAAACGT
9901	CCGCAATGTG	TTATTAAGTT	GTCTAAGCGT	CAATTTTTC	CTTCTATGGT
9951	CCCGTTTGT	TATCTCTCTA	ATTATATAAT	CCAGCTTAAA	TAAGTTAAGA
10001	GACAAACAAA	CAACACAGAT	TATTAAATAG	ATTATGTAAT	CTAGATACCT
10051	AGATTATGTA	ATCCATAAGT	AGAATATCAG	GTGCTTATAT	AATCTATGAG
10101	CTCGATTATA	TAATCTTAAA	AGAAAACAAA	CAGAGCCCCCT	ATAAAAAGGG
10151	GTCAAGTGGA	CATTGGGTCA	CTCATTTAAT	CCCTCCCTCT	CCTCTTTTAT
10201	CCCTCTTTT	GGTGATTCA	CCAATAGTGG	TGTGCACCTG	TGATTGGCTC
10251	GTAAAAATTC	TTCGACGGAT	GGAAGAGTGA	AGAGATAAGC	AAGTCAAAGA
10301	AAAGTAACAA	CGAAGCTTCA	TCAGCTACAA	ATTTTGGCCC	AACTGGTTGC
10351	ACCAGCACCA	AACTTACGTA	TACATGATTA	TCTCTGTTTC	CCTCATTTTC
10401	AGAAAAAAA	CGGGTTTCAA	AACCCACTGC	TTTCAGGAGT	AAAAAAGAT
10451	AATAATCTGA	AACATTGCTT	CAACCTGGC	CCTTATTTGG	TTACGTTGCA
10501	ATTCACCCCA	ATCCCATGT	GGATTGAGAT	GGATTGCAGT	GTAGCTAGAC
10551	AAACCCCTAG	GCCCTGTTTG	CATAGGAATA	CACCAGGAAT	TATTCAGCT

Replacment Sheet

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FIG. 1 continued

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10601 AATCAAAATT TATATAAATG AGAGAAACAA TTCGGATAGG AATTGTTCCA
10651 GGACTTTCATT CTGCAGTAAC CGAACGGGCC CTTAATCCAC CCCAATACAC
10701 GTGGATTGGA GTGGATTGAG GTACAGCCAA ACAAGGCCA ACTGCAGATC
10751 AAATAAATCA CCCGTCATAT TCTTCTACCT ACAAAAACAG CAATAAACAC
10801 CTGAATGAAG TTCTAATTTG CACAGTGTAG GTAGGATGAA AATAGTTACC
10851 TCCTCATGGT CAGTAACTCT TGGCACACAA CTTACATGT AATCGATGTA
10901 CCACTTGGCT CTTGCCTGAA ACCCAATACA TCTTAGCAT AAGAATAATA
10951 TTATGATGCC AAGGCATGAT CACCAGCACT CTTTATTGT TTAGTAAATC
11001 TATCACTCCC CAAAACAATT CAAATGAACA GAGATGCATT GCCCCCAATG
11051 AATTCTATTT CAATTAGCCG GAAAATTCCTA CTTATCAGA AGCATCCAAA
11101 TTGCCAGCAT CCTTACTAGA CTGACCATGA CCAGGCTGCC GCAGATGCTT
11151 CTTTTTCTGT CCTCTCCTCT TTGCCTTGAG TTTCTCTTCA AGATCCCTCA
11201 CCCACGCTCT CTTATACATC TTAAAGCTAA CATGTCTCTC CTCCGCCATC
11251 TTCCTAACCT TCTCAGTAAT CTCAGCAGCA ATCTGACGGT TGTACAACTT
11301 CTTACAGCCC TTCATCAACT TTGCAAATGT GTCAGGCTGT GGCATCAGTC
11351 CTGCCTCTAG CATGTCTAAG CAATACAGGC AGGCCTCCTT GACATGTTT
11401 TTCGCAACA GTGCATGAAT CCAGATAGTC CATGCACTCA CATTGAGCTC
11451 ACAGCCTTTG CTCACAATAC ATTTCCAAAC ATCCTTTGCA AGCTCAAGTT
11501 TCTCATCTCT GACCAACGCA TTGAGGAGGT CCTTCAGCAC CCCATATTGC
11551 GGTACCACAA AGAGCCCCCT CCCAACCATG TCTTTAAAT AACTACATGC
11601 CTCATCAGC AAACCTGCC CAACAAGGCC ACTCACCAGC ATAGCAAAATG
11651 TATCGACCAC AGGACTGAGC CCAGCACTTT CCATCTCATT CCACAATGTC
11701 ATGGCTTGCT TGGTCTCCCC AAGCCTGCAG GCCAACCAGT TCACCACATT
11751 GTATATCTTG AGATCTGGTG GACACCGGCA CTCGCGCATC CTCTCCATCA
11801 GCTCCAAGCA CTCCTCAAGC TGCTCCTTCT TCTCGTGTGC TACAAAGAAA
11851 CCATGGTACA CGGCAGCGTC CACCCGCAGG CCATCCCTCG ACATAGCATC
11901 CAAGAATCG TACCCCTGGG AT

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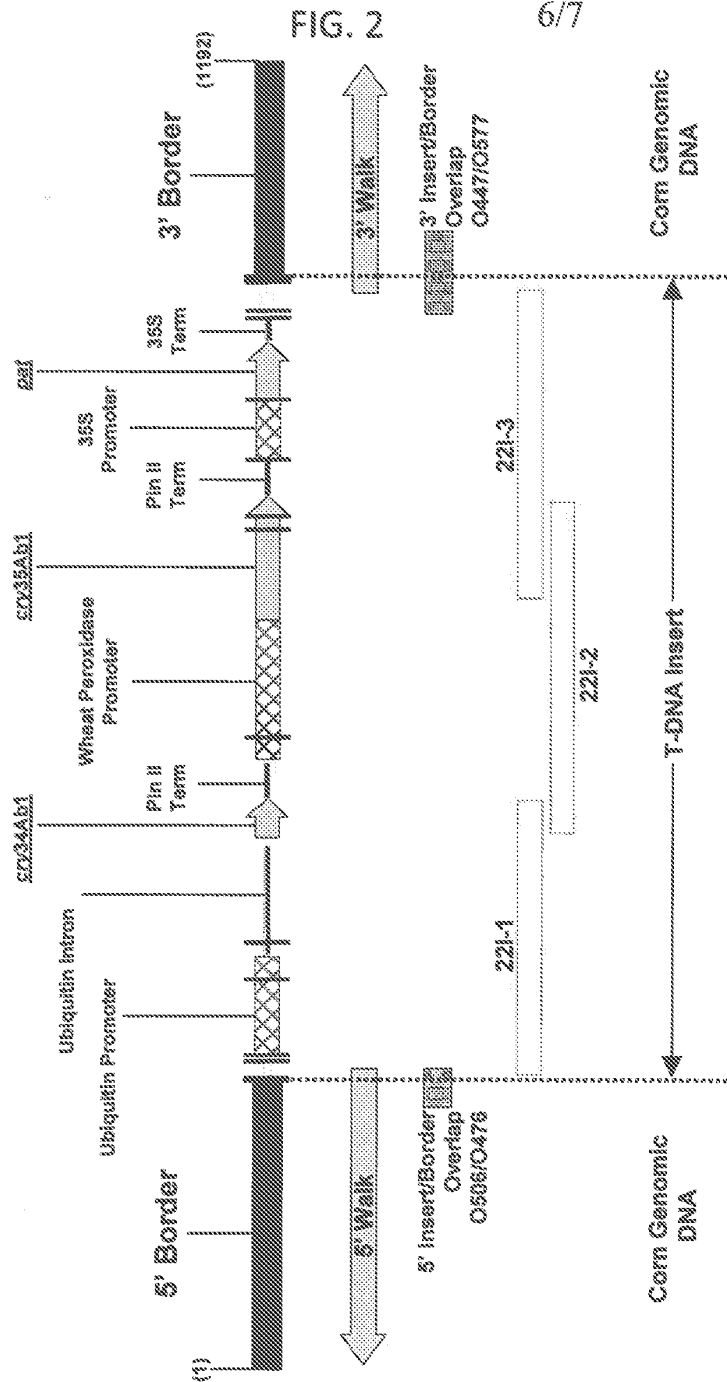
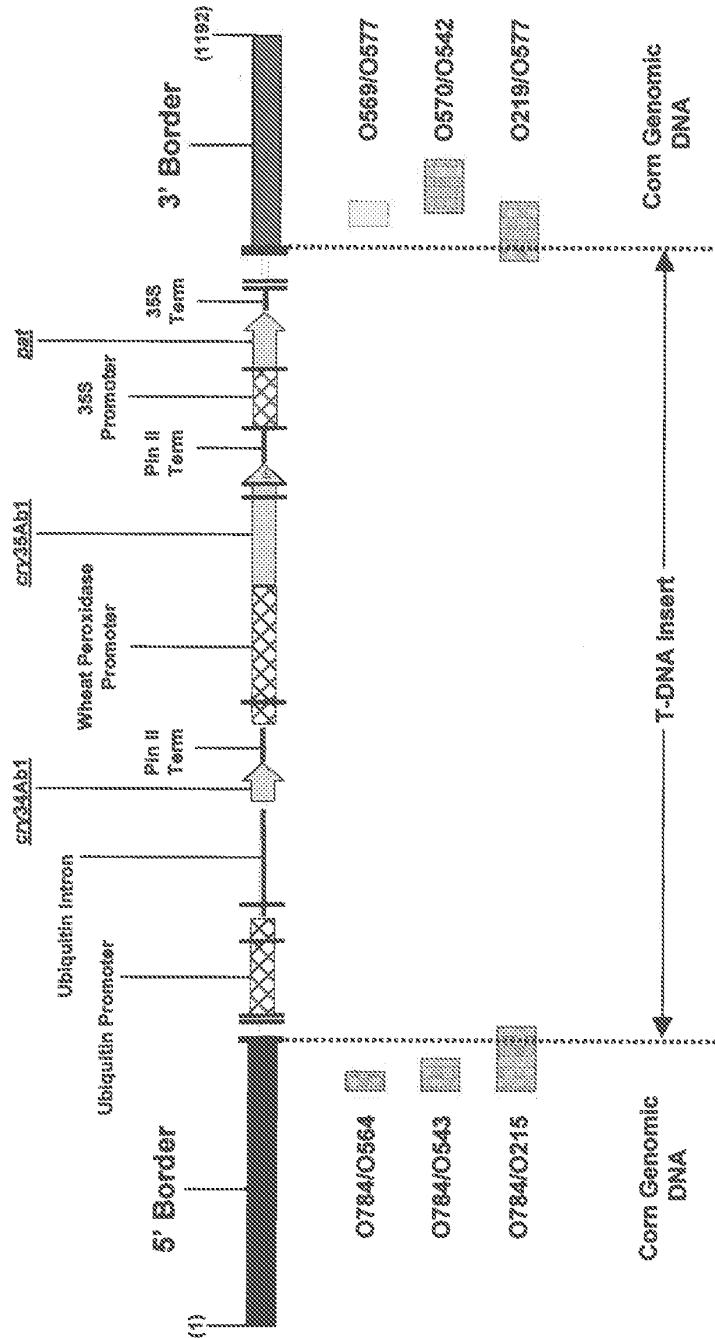


FIG. 3

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/907,488	10/19/2010	JAMES WAYNE RING	035718/387563	2088

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KUBELIK, ANNE R.

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Application No. : 12907488
Applicant : Bing
Filing Date : 10/19/2010
Date Mailed : 09/10/2013

NOTICE TO FILE CORRECTED APPLICATION PAPERS

Notice of Allowance Mailed

This application has been accorded an Allowance Date and is being prepared for issuance. The application, however, is incomplete for the reasons below.

Applicant is given 2 month(s) from the mail date of this Notice, or the time remaining from the Notice of Allowance and Fee(s) Due, whichever is longer, within which to respond.

The informalities requiring correction are indicated in the attachment(s). If the informality pertains to the abstract, specification (including claims) or drawings, the informality must be corrected with an amendment in compliance with 37 CFR 1.121 (or, if the application is a reissue application, 37 CFR 1.173). Such an amendment may be filed after payment of the issue fee if limited to correction of informalities noted herein. See Waiver of 37 CFR 1.312 for Documents Required by the Office of Patent Publication, 1280 Off. Gaz. Patent Office 918 (March 23, 2004). In addition, if the informality is not corrected until after payment of the issue fee, for purposes of 35 U.S.C. 154(b)(1)(iv), "all outstanding requirements" will be considered to have been satisfied when the informality has been corrected. A failure to respond within the above-identified time period will result in the application being ABANDONED. **This period for reply is NOT extendable under 37 CFR 1.136(a).**

See attachment(s).

*A copy of this notice **MUST** be returned with the reply. Please address response to "Mail Stop Issue Fee, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450".*

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**DRAWINGS AND BRIEF DESCRIPTION OF DRAWINGS
IN NON-COMPLIANCE WITH 37 CFR 1.84(u)(1)**

37 CFR 1.84(u)(1) states, "The different views must be numbered in consecutive Arabic numerals, starting with 1 ... Partial views intended to form one complete view, on one or several sheets, must be identified by the same number followed by a capital letter. View numbers must be preceded by the abbreviation 'FIG.' "

Other methods of identification are improper, including Roman numerals (FIG. I, FIG. II, etc.) and alphabetic characters (FIG. A, FIG. B, etc.). Abbreviations and words other than "FIG." ("Illustration, 1" "Diagram 2," "Photo 3," etc.) are improper.

- ☐ Applicant must submit drawings that number the views using consecutive Arabic numerals.
- ☐ Applicant must amend the brief description of the drawings on Page(s) of the specification to show consecutive Arabic numerals.

NOTE: Applicant is advised that the detailed description may voluntarily be amended to identify the drawings by Arabic numerals.

- ☒ The drawing is continued onto a second page (or more) without proper labeling under 37 CFR 1.84(u)(1). FIG(s) 1 to 3
- ☐ Applicant must submit drawings on which the view numbers are preceded by the abbreviation "FIG."
- ☐ Applicant must amend the brief description of the drawings on Page(s) of the specification to show view numbers preceded by the abbreviation "FIG."

NOTE: Applicant is advised that the detailed description may voluntarily be amended to show view numbers preceded by the abbreviation "FIG."

Electronic Acknowledgement Receipt	
EFS ID:	16967449
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Confirmation Number:	2088
Title of Invention:	CORN EVENT DAS-59122-7 AND METHODS FOR DETECTION THEREOF
First Named Inventor/Applicant Name:	JAMES WAYNE BING
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Filer:	Mary Anthony Merchant.
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Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
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			bb48dc740947173131f0c06a983dddb60e6c5463		
Warnings:					
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2	Drawings-only black and white line drawings	36446_0047U1_2013_09_26_Replacement_Drawings_as_Filed.pdf	610800	no	7
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SCORE Placeholder Sheet for IFW Content

Application Number: 12907488

Document Date: 09/26/2013

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Form Revision Date: February 8, 2006

PART B - FEE(S) TRANSMITTAL

**Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885**

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

29122 7590 07/31/2013
ALSTON & BIRD LLP
PIONEER HI-BRED INTERNATIONAL, INC.
BANK OF AMERICA PLAZA
101 SOUTH TRYON STREET, SUITE 4000
CHARLOTTE, NC 28280-4000

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/907,488	10/19/2010	JAMES WAYNE BING	~~0333838090X~~ 36446.0047U1	2088

TITLE OF INVENTION: CORN EVENT DAS-59122-7 AND METHODS FOR DETECTION THEREOF

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$1780	\$300	\$0	\$2080	10/31/2013

EXAMINER	ART UNIT	CLASS-SUBCLASS
KUBELIK, ANNE R	1638	800-302000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 Ballard Spahr LLP
- (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 _____
- 3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

Pioneer Hi-Bred International, Inc.
E.I. du Pont de Nemours and Company
Dow Agrosociences LLC

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Johnston, Iowa
Wilmington, Delaware
Indianapolis, Indiana

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☒ Issue Fee
- ☒ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
- ☒ Payment by credit card. ~~From PTO-2038 is not ok~~ EFS Web
- ☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number 14-0629 (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29

☐ Applicant asserting small entity status. See 37 CFR 1.27

☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see form PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature /MaryAnthonyMerchant, Reg. No. 39,771/

Date October 24, 2013

Typed or printed name Mary Anthony Merchant, J.D., Ph.D.

Registration No. 39,771

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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Electronic Patent Application Fee Transmittal				
Application Number:		12907488		
Filing Date:		19-Oct-2010		
Title of Invention:		CORN EVENT DAS-59122-7 AND METHODS FOR DETECTION THEREOF		
First Named Inventor/Applicant Name:		JAMES WAYNE BING		
Filer:		Mary Anthony Merchant./Beverly Hopkins		
Attorney Docket Number:		035718/387563		
Filed as Large Entity				
Utility under 35 USC 111(a) Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Publ. Fee- Early, Voluntary, or Normal	1504	1	300	300
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Utility Appl Issue Fee	1501	1	1780	1780

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				2080

Electronic Acknowledgement Receipt	
EFS ID:	17218048
Application Number:	12907488
International Application Number:	
Confirmation Number:	2088
Title of Invention:	CORN EVENT DAS-59122-7 AND METHODS FOR DETECTION THEREOF
First Named Inventor/Applicant Name:	JAMES WAYNE BING
Correspondence Address:	PIONEER HI-BRED INTERNATIONAL, INC. - 7100 NW 62nd Avenue P.O. Box 1014 Johnston IA 50131-1014 US - -
Filer:	Mary Anthony Merchant.
Filer Authorized By:	
Attorney Docket Number:	035718/387563
Receipt Date:	24-OCT-2013
Filing Date:	19-OCT-2010
Time Stamp:	14:31:15
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$2080

RAM confirmation Number		835			
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File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	36446_0047U1_2013_10_24_Is sue_Fee_as_Filed.pdf	1017486	no	2
			6d20a67f7448553107bec8940fcb06050 33409		
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	32483	no	2
			219b70135afea8d97eed641441fc02d1765 3c8ee		
Warnings:					
Information:					
Total Files Size (in bytes):			1049969		
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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/907,488	11/26/2013	8592653	035718/387563	2088

7590 11/06/2013
PIONEER HI-BRED INTERNATIONAL, INC.
7100 NW 62nd Avenue
P.O. Box 1014
Johnston, IA 50131-1014

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment is 372 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site <http://pair.uspto.gov> for additional applicants):

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