

SCORE Placeholder Sheet for IFW Content

Application Number: 11938359

Document Date: 11/12/2007

The presence of this form in the IFW record indicates that the following document type was received in electronic format on the date identified above. This content is stored in the SCORE database.

- **Sequence Listing**

Since this was an electronic submission, there is no physical artifact folder, no artifact folder is recorded in PALM, and no paper documents or physical media exist. The TIFF images in the IFW record were created from the original documents that are stored in SCORE.

To access the documents in the SCORE database, refer to instructions developed by SIRA.

At the time of document entry (noted above):

- Examiners may access SCORE content via the eDAN interface.
- Other USPTO employees can bookmark the current SCORE URL (<http://es/ScoreAccessWeb/>).
- External customers may access SCORE content via the Public and Private PAIR interfaces.

Form Revision Date: February 8, 2006

SCORE Placeholder Sheet for IFW Content

Application Number: 11938359

Document Date: 11/12/2007

The presence of this form in the IFW record indicates that the following document type was received in electronic format on the date identified above. This content is stored in the SCORE database.

- Design Drawing

Since this was an electronic submission, there is no physical artifact folder, no artifact folder is recorded in PALM, and no paper documents or physical media exist. The TIFF images in the IFW record were created from the original documents that are stored in SCORE.

To access the documents in the SCORE database, refer to instructions developed by SIRA.

At the time of document entry (noted above):

- Examiners may access SCORE content via the eDAN interface.
- Other USPTO employees can bookmark the current SCORE URL (<http://es/ScoreAccessWeb/>).
- External customers may access SCORE content via the Public and Private PAIR interfaces.

Form Revision Date: February 8, 2006

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.

UTILITY PATENT APPLICATION TRANSMITTAL <i>(Only for new nonprovisional applications under 37 C.F.R. 1.53(b))</i>	Attorney Docket No.	1895D4
	First Inventor	James Wayne Bing
	Title	Corn Event DAS-59122-7 and methods for Detection Thereof
	Express Mail Label No.	

APPLICATION ELEMENTS <i>See MPEP chapter 600 concerning utility patent application contents.</i> ☐ Fee Transmittal Form (e.g., PTO/SB/17) <i>(Submit an original and a duplicate for fee processing)</i> ☐ Applicant claims small entity status. See 37 CFR 1.27. ☒ Specification [Total Pages <u>43</u>] Both the claims and abstract must start on a new page <i>(For information on the preferred arrangement, see MPEP 608.01(a))</i> ☒ Drawing(s) (35 U.S.C. 113) [Total Sheets <u>1</u>] Oath or Declaration [Total Sheets <u>13</u>] ☐ Newly executed (original or copy) ☒ Copy from a prior application (37 CFR 1.63 (d)) <i>(for a 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) and 1.33(b). ☒ Application Data Sheet. See 37 CFR 1.76 ☐ CD-ROM or CD-R in duplicate, large table or Computer Program <i>(Appendix)</i> ☐ Landscape Table on CD Nucleotide and/or Amino Acid Sequence Submission <i>(if applicable, items a.-c. are required)</i> - Computer Readable Form (CRF) ☒ Computer Readable Form (CRF) ☐ Transfer Request (37 CFR 1.821(e)) - Specification Sequence Listing on: ☐ CD-ROM or CD-R (2 copies); or ☐ Paper ☒ Statements verifying identity of above copies	ADDRESS TO: Commissioner for Patents P.O. Box 1450 Alexandria VA 22313-1450 ACCOMPANYING APPLICATIONS PARTS ☐ Assignment Papers (cover sheet & document(s)) Name of Assignee _____ ☐ 37 C.F.R. 3.73(b) Statement ☐ Power of Attorney <i>(when there is an assignee)</i> ☐ English Translation Document <i>(if applicable)</i> ☒ Information Disclosure Statement (PTO/SB/08 or PTO-1449) ☐ Copies of foreign patent documents, publications & other information ☐ Preliminary Amendment ☐ Return Receipt Postcard (MPEP 503) <i>(Should be specifically itemized)</i> ☐ Certified Copy of Priority Document(s) <i>(if foreign priority is claimed)</i> ☐ Nonpublication Request under 35 U.S.C. 122(b)(2)(B)(i). Applicant must attach form PTO/SB/35 or equivalent. ☒ Other: Filing of an Information Disclosure Statement; Statement regarding sequences; Statement Appendices _____ _____
18. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below and in the first sentence of the specification following the title, or in an Application Data Sheet under 37 CFR 1.76: ☐ Continuation ☒ Divisional ☐ Continuation-in-part (CIP) of prior application No: <u>11 / 237,222</u> Prior application information: <u>Examiner Kubilek, Anne R.</u> Art Unit: <u>1638</u>	
19. CORRESPONDENCE ADDRESS ☒ The address associated with Customer Number <u>27310</u> OR ☐ Correspondence address below	
Name _____ Address _____ City _____ State _____ Zip Code _____ Country _____ Telephone _____ Email address _____	
Signature _____ /Claire L. Moxon/ Date Nov. 12, 2007 Name (Print/Type) Claire L. Moxon Registration No. (Attorney/Agent) 57,557	

This collection of information is required by 37 CFR 1.53(b). 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 1.11 and 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: Mail Stop Patent Application, 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.

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

5 **James Wayne Bing**
 Robert F. Cressman, Jr.
 Manju Gupta
 Salim M. Hakimi
 David Hondred
10 **Todd L. Krone**
 Mary Hartnett Locke
 Abigail K. Luckring
 Sandra E. Meyer
 Daniel Moellenbeck
15 **Kenneth Edwin Narva**
 Paul D. Olson
 Craig D. Sanders
 Jimei Wang
 Jian Zhang
20 **Gan-Yuan Zhong**

CROSS-REFERENCE TO RELATED APPLICATIONS

This application 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 which are herein incorporated by reference in their entirety.

25 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-
30 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

5 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

10 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 (Wohllleben W. *et al.* (1988) *Gene* 70: 25-37) operably connected to a DNA molecule

15 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-

20 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);
- 25 5'-AATTGAGCGCTTGACGTTT-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);
- 30 5'-AACCCTTAGTATGTATTTGTATT-3' (SEQ ID NO: 8);
- 5'-CTCCTTCAACGTTGCGGTTCTGTGTCAG-3' (SEQ ID NO: 9);
- 5'-TTTTGCAAAGCGAACGATTCAGATG-3' (SEQ ID NO: 10);

5'-GCGGGACAAGCCGTTTTACGTTT-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 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);
10 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
15 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
20 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
25 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
30 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
5 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
10 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:
15 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.

20 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.
25 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
30 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
5 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
10 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.

15 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 PHI17662A (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
20 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
25 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
30 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
30 T-DNA insert, and the 3' border region with corn genomic DNA. Boxes beneath the diagram 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, Springer-Verlag; New York, 1991; and Lewin, *Genes V*, Oxford University Press: New York, 10 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 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 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 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 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 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

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.

20 The CLUSTAL program is well described by Higgins and Sharp, *Gene* 73: 237-244 (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 PH117662A 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 (Wohllleben 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) 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 PH17662 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 insertions 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	+	+	+

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.

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.

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

 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
30 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, *EcoR* V, *Pvu* II, *Sma* I and *Stu* I for the Universal Genome Walker method and *BamH* I, *EcoR* 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) AATTGAGCGCTTGACGTTT	9846-9827

02-O-370	(SEQ ID NO: 4) AACAAACAAGACCGGCCACACCCTC	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) GCGGGACAAGCCGTTTACGTTT	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) CATGTATACGTAAAGTTTGGTGCTGG	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.

30

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.

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
5 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. A DNA construct comprising: a first, second, and third expression cassette, wherein said first expression cassette in operable linkage comprises:

- (a) a maize ubiquitin promoter;
- (b) a 5' untranslated exon of a maize ubiquitin gene;
- (c) a maize ubiquitin first intron;
- (d) a Cry34Ab1 encoding DNA molecule; and
- (e) a PinII transcriptional terminator;

said second expression cassette comprising in operable linkage

- (i) a wheat peroxidase promoter;
- (ii) a Cry35Ab1 encoding DNA molecule; and
- (iii) a PinII transcriptional terminator; and

said third expression cassette comprising in operable linkage

- (1) a CaMV 35S promoter;
- (2) a *pat* encoding DNA molecule; and
- (3) a 3' transcriptional terminator from (CaMV) 35S.

2. A plant comprising the DNA construct of claim 1.

3. A plant of claim 2, wherein said plant is a corn plant.

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.

Corn Event DAS-59122-7 and Methods for Detection Thereof
 Bing, et al.
 Atty Docket No. 1895D4

Figure 1/3

1	CTGAGCGCAC	AACAGCGAGT	CGCATGGCAC	CGGACGACAT	GAGCGAGATT
51	TAGATCGGAG	GGTGCGGACA	TGGGGCAACC	TGCGCAGCTA	ACGCAGGGAT
101	CCACACGACC	ACCAACGAAG	CCAAGCCCGG	GCACGTCCCC	AGGCAGGTTG
151	GGCCCTGGTT	CCACCAGCGG	ATGCATGCAG	TGAAGCGGGG	ACGGAGAGAC
201	AAGCCGAGGG	CGCGGGTGGG	AATGGCGTCC	GGGAGGACGA	GTGGAGGAGA
251	AGAATCTAGA	GGCATCGAGA	TTCGAGAAGC	CGACGGAGAC	AAGATTTCGTG
301	TGGGGGGAGA	CAAACCGCGG	GGCTGAGCGC	CGTTGATATG	GGATCAGACG
351	GTGTGGATAA	AAAAAGTGAC	GTGATAGAA	CGTCTGGCCA	GTGAAAAAAC
401	AAAACAACCTC	CAACAAAATA	CTTTAAAAGC	TCTTATACCC	TAAATGTAGG
451	GGATCAAACA	CGTCTCTACA	CTATTTAGCA	GCGTCCTCTA	AATGATCCTC
501	TAAATTTAGA	GAACGCTACT	AGATTCTCTA	TATATAGTTT	CTCTAAACGA
551	TCTTTTATCC	ATTTAAATAC	TTTAAATAAC	CGGTTTAACA	AAACTAAAAAT
601	ATATACAATA	CATTTGAGAG	TATGACAAAT	ACGTATGTAT	AAAAATAAAA
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	CACTATTAAA
901	AATCTATGGT	TATAACTTAT	AATAACATGA	AAAAATAATT	TAGCATCCCCA
951	TATATATAAA	AACTGAAGGA	AGCCATATAT	ACTAACATAA	GTTAGGAGAA
1001	ACTAAGAAGG	TTGTGCAAAG	CTTGCACTGC	TCCAAAATAC	TGCAAAACAAC
1051	CACCTCTCCTC	TACCAACCAA	AGAAACTCAT	GTA CTCCCTC	CGTTCTTTTT
1101	TATTTGTGCG	ATTTTAGTTT	AAAAATGAAC	TAGCAGTCTGA	CAAAATTTTCG
1151	AGAACAGATA	TAGTATATAC	TAACATAACT	TAGGAGATAC	TAAGAAAGTT
1201	GCGCAGAGCT	TTCCTGTTC	CAAATTACTG	CAAAGCCTCT	CCCCTCTGCC
1251	AGTACATCTA	CGAGATGTTT	CAGTTAAACA	AAGATTTCAGA	CAAGTGATGA
1301	GCCACTTCTT	GTCATAGATT	GTGTGGTCAA	CCAACCCATT	GATGCCACGG
1351	TTTTTGTGCA	TCCATGCTTT	TGTATTAAAA	CATCAGTTAT	GTTTACCATG
1401	TCCGATATGC	TCTACATAAT	GACAATCAAC	TTGGTGTTCA	TTATATTTAC
1451	AATGTTAGGA	ATTTCAATAG	CTACGAACAC	TTCAATAGAA	GTGCCTTTGT
1501	GGGATCACCT	TAATGTGTTG	TTGATGTAAG	GAGAAGAATC	TTAATTTACT
1551	CTTGCTAAAT	TTGAACTACA	CAAAACCACT	GCACTGAGGA	TTGTCCTAAT
1601	AAATTACTGC	TCATACACGT	TAGCATCTGT	TCAGATACTG	AGCTAATCCC
1651	TAGGATTAAA	GGATTTGTAA	AAGATATGCC	CAATCATTCA	TTTTAGTTAT
1701	TTATTTCTTA	GTTATCCACT	TGAAGATTTA	CATACATTTG	AAATAAATTT
1751	CTTAGAGGTA	AAGTGAAAAAT	CAGTTATTTA	AATACATTTT	AGTTATTTAT
1801	TTTCTTCTTT	TTCTTAATTT	TTCTTGTAT	TTGAAGTCTG	AAAAGATAAC
1851	TTTGCCCTTA	TACATATTTT	ATCTTCTACG	TACGCATCTG	AACAACGTCT
1901	CTTTGTCCCC	TGATCGTGCA	GCAATTAGTG	CTATGAATCG	CGTTTAAGCG
1951	CTGCAAAATC	ATGGCTGGGG	CTTCGTCTCT	GAGTCGTCTT	GCTGCTCGAT
2001	GTCACCTCGA	GTCCCGCACC	GACCTCAGTG	CTTGTTCTTG	TTGGAGCCAC
2051	CTCTCTCGGA	CGATCGCCAA	AGACGGATAA	GGCCGAAGCC	GTCACCTTCAG
2101	ACCGCGCTCA	TGCGCCGTAG	CAGACTCCTA	CATAGCAGGG	CCAGGGTATG
2151	TGGACCTTTG	CAAGTTTAGG	ATTGGAACCA	GCGACCAGAA	TCCACAAGAT
2201	TGGAGCAAAC	GACCAAAAAAT	TCACAAGGAT	TGGCGGCTGA	CATTGCCAGC
2251	GCGGGATCGC	ATGCGGCGGC	GGCGGCCGGG	GCGAGCACGG	GAGCAGGCCGA
2301	CAGTCGAGCT	CCATTGGAAC	GTAGAAATAC	TTAAGGGCAA	GGTCTCCAAA
2351	TACTTGAAAA	AATAGGAAAA	AGAAGAAAAAT	ACATGAAATG	ATATTGAAAT
2401	CAATTGGAAG	ATGTTATGAA	TCTTGTTTTT	GCAAAGCGAA	CGATTTCAGAT
2451	GGCAAAACTA	TGAATCTTTT	TGTTTGAAGT	CCCAAATATA	AAATTTTCTC
2501	GTACTACCA	ACATTGGTGC	GCACCTGTGA	TTGGCTCATA	AAAATTCTTG

2551	GAGGGACGGA	AGAAAGAGTG	AAGGGATAAG	CAAGTAAAAG	CGCTCAAACA
2601	CTGATAGTTT	AAACTGAAGG	CGGGAAACGA	CAATCTGATC	ATGAGCGGAG
2651	AATTAAGGGA	GTCACGTTAT	GACCCCGGCC	GATGACGCGG	GACAAGCCGT
2701	TTTACGTTTG	GAACGTACAG	AACCGCAACG	TTGAAGGAGC	CACTCAGCAA
2751	GCTTACTAGT	AGCGCTGTTT	AAACGCTCTT	CAACTGGAAG	AGCGGTTACC
2801	CGGACCGAAG	CTTGCATGCC	TGCAGTGCAG	CGTGACCCGG	TCGTGCCCCCT
2851	CTCTAGAGAT	AATGAGCATT	GCATGTCTAA	GTTATAAAAA	ATTACCACAT
2901	ATTTTTTTTT	TCACACTTGT	TTGAAGTGCA	GTTTATCTAT	CTTTATACAT
2951	ATATTTAAAC	TTTACTCTAC	GAATAATATA	ATCTATAGTA	CTACAATAAT
3001	ATCAGTGTTT	TAGAGAATCA	TATAAATGAA	CAGTTAGACA	TGGTCTAAAG
3051	GACAATTGAG	TATTTTGTACA	ACAGGACTCT	ACAGTTTTAT	CTTTTTTAGTG
3101	TGCATGTGTT	CTCCTTTTTT	TTTGCAAATA	GCTTCACCTA	TATAATACTT
3151	CATCCATTTT	ATTAGTACAT	CCATTTAGGG	TTTAGGGTTA	ATGGTTTTTTA
3201	TAGACTAATT	TTTTTAGTAC	ATCTATTTTA	TTCTATTTTA	GCCTCTAAAT
3251	TAAGAAAAC	AAAACCTCTAT	TTTAGTTTTT	TTATTTAATA	ATTTAGATAT
3301	AAAATAGAAT	AAAATAAAGT	GACTAAAAAT	TAAACAAATA	CCCTTTAAGA
3351	AATTAAAAAA	ACTAAGGAAA	CATTTTCTT	GTTTCGAGTA	GATAATGCCA
3401	GCCTGTTAAA	CGCCGTCGAC	GAGTCTAACG	GACACCAACC	AGCGAACCAG
3451	GCGCTCGCG	TCGGGCCAAG	CGAAGCAGAC	GGCAGCGCAT	CTCTGTTCGCT
3501	GCCTCTGGAC	CCCTCTCGAG	AGTTCCGCTC	CACCGTTGGA	CTTGCTCCGC
3551	TGTCGGCATC	CAGAAATTGC	GTGGCGGAGC	GGCAGACGTG	AGCCGGCACG
3601	GCAGGCGGCC	TCCTCCTCCT	CTCACGGCAC	CGGCAGCTAC	GGGGGATTCC
3651	TTTCCACCG	CTCCTTCGCT	TTCCCTTCCT	CGCCCGCCGT	AATAAATAGA
3701	CACCCCTCC	ACACCCCTCT	TCCCCAACCT	CGTGTGTGTC	GGAGCGCACA
3751	CACACACAAC	CAGATCTCCC	CCAAATCCAC	CCGTCGGCAC	CTCCGCTTCA
3801	AGGTACGCCG	CTCGTCCTCC	CCCCCCCCC	CTCTCTACCT	TCTCTAGATC
3851	GGCGTTCCGG	TCCATGGTTA	GGGCCCGGTA	GTTCTACTTC	TGTTTCATGTT
3901	TGTGTTAGAT	CCGTGTTTGT	GTTAGATCCG	TGCTGCTAGC	GTTTCGTACAC
3951	GGATGCGACC	TGTACGTCAG	ACACGTTCTG	ATTGCTAACT	TGCCAGTGTT
4001	TCTCTTTGGG	GAATCCTGGG	ATGGCTCTAG	CCGTTCCGCA	GACGGGATCG
4051	ATTTTCATGAT	TTTTTTTGT	TCGTTGCATA	GGGTTTGTT	TGCCCTTTTC
4101	CTTTATTTCA	ATATATGCCG	TGCACTTGTT	TGTCGGGTCA	TCTTTTTCATG
4151	CTTTTTTTTG	TCTTGTTTGT	GATGATGTGG	TCTGGTTGGG	CGGTCGTTCT
4201	AGATCGGAGT	AGAATTCTGT	TTCAAACCTAC	CTGGTGGAAT	TATTAATTTT
4251	GGATCTGTAT	GTGTGTGCCA	TACATATTCA	TAGTTACGAA	TTGAAGATGA
4301	TGGATGGAAA	TATCGATCTA	GGATAGGTAT	ACATGTTGAT	GCGGGTTTTA
4351	CTGATGCATA	TACAGAGATG	CTTTTTGTTC	GCTTGGTGTT	GATGATGTGG
4401	TGTGGTTGGG	CGGTCGTTCA	TTGTTCTAG	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	GTAATGTTTC	TTTTGTGCTG	GCTCACCTCG	TTGTTTGGTG
4801	TTACTTCTGC	AGGTCGACTC	TAGAGGATCC	ACACGACACC	ATGTCCGCCC
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	AAGTCCCAGT	ACGAGATCAT	CACCCAGGGC	GGCTCCGGCA
5151	ACCAAGTCCCA	CGTGACCTAC	ACCATCCAGA	CCACCTCCTC	CCGCTACGGC
5201	CACAAGTCCCT	GAGTCATGAG	TCATGAGTCA	GTTAACCTAG	ACTTGTCCAT
5251	CTTCTGGATT	GGCCAACCTA	ATTAATGTAT	GAAATAAAAG	GATGCACACA
5301	TAGTGACATG	CTAATCACTA	TAATGTGGGC	ATCAAAGTTG	TGTGTTATGT
5351	GTAATTACTA	GTTATCTGAA	TAAAAGAGAA	AGAGATCATC	CATATTTCTT
5401	ATCCTAAATG	AATGTCACGT	GTCTTTTATA	TTCTTTGATG	AACCAGATGC

5451	ATTTCAATTAA	CCAAATCCAT	ATACATATAA	ATATTAATCA	TATATAATTA
5501	ATATCAATTG	GGTTAGCAAA	ACAAATCTAG	TCTAGGTGTG	TTTTGCGAAT
5551	GCGGCCGCGG	ACCGAATTGG	GGATCTGCAT	GAAAGAAACT	GTCGCACTGC
5601	TGAACCGCAC	CTTGTCACCT	TCATCGAACA	CGACCTGTGC	CCAAGATGAC
5651	GGTGCTGCGG	TCTAAGTGAG	GCTGAATTGC	CTTGACAGA	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	GTGATGAATG
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	TATTGATTTCG	AAGATATATG	TTTCTTTCTC
6351	CCACGGGCAC	CTAACGGATA	CATGATAAGG	CCAAGGCAGA	TCACGGGAAA
6401	TTATTTCGAAT	ACATGTTACG	CCCTATTGCC	GGAAAAAATA	TGCAGGGCAG
6451	GTGTTGGCCG	TAGCGATTTA	AGCACTTAAG	CTGGAGGTTG	CCACACTTGG
6501	ATGCAAGCGT	CTGACCCTTC	TAAAAATATCG	GCGGCTTTGT	CCGTATCCGT
6551	ATCCCCTATC	CGACATCTAG	CTGGCCACAC	GACGGGGCTG	GGCAGATCGT
6601	GGATGCCGGG	TCGACGTCGA	TCGTACGCCA	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	GTTCTCTTC	CCGATCGACG
7051	ACGACCAGTA	CATCATCACC	TCCTACGCCG	CCAACAACATG	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
7351	AGCTCAAGGA	CTACCCGAAG	TACTCCCCGA	CCGGCAACAT	CGACAACGGC
7401	ACCTCCCCGC	AGCTCATGGG	CTGGACCCTC	GTGCCGTGCA	TCATGGTGAA
7451	CGACCCGAAC	ATCGACAAGA	ACACCCAGAT	CAAGACCACC	CCGTACTACA
7501	TCCTCAAGAA	GTACCAGTAC	TGGCAGAGGG	CCGTGGGCTC	CAACGTGCGG
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	GAAGTCCATC	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	ACTTGTCCAT	CTTCTGGATT	GGCCAACTTA
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	TTTTGCGAAT	TCCCATGGAG	TCAAAGATTC
8401	AAATAGAGGA	CCTAACAGAA	CTCGCCGTAA	AGACTGGCGA	ACAGTTCATA
8451	CAGAGTCTCT	TACGACTCAA	TGACAAGAAG	AAAATCTTCG	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	GACGCACAAT
8851	CCCACTATCC	TTGCAAGAC	CCTTCCTCTA	TATAAGGAAG	TTCATTTTAT
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	AAGGTTTTAA	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	CCCCTGAAA	TCACCAGTCT	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	ATGCCCCGCG
9751	ATATCGATGG	GCCCCGGCCG	AAGCTTCGGT	CCGGGCCATC	GTGGCCTCTT
9801	GCTCTTCAGG	ATGAAGAGCT	ATGTTTAAAC	GTGCAAGCGC	TCAATTGCGC
9851	CTATAGTGAG	TCGTATTACA	ATCGTACGCA	ATTCAGTACA	TTAAAAACGT
9901	CCGCAATGTG	TTATTAAGTT	GTCTAAGCGT	CAATTTTTC	CTTCTATGGT
9951	CCCGTTTGT	TATCCTCTAA	ATTATATAAT	CCAGCTTAAA	TAAGTTGTA
10001	GACAAACAAA	CAACACAGAT	TATTAAATAG	ATTATGTAAT	CTAGATACCT
10051	AGATTATGTA	ATCCATAAGT	AGAATATCAG	GTGCTTATAT	AATCTATGAG
10101	CTCGATTATA	TAATCTTAAA	AGAAAACAAA	CAGAGCCCC	ATAAAAAGGG
10151	GTCAAGTGG	CACTTGGTCA	CTCATTTAAT	CCCTCCCTCT	CCTCTTTTAT
10201	CCCTCTTTTT	GGTGTATTCA	CCAATAGTGG	TGTGCACCTG	TGATTGGCTC
10251	GTAAAAATT	TTGGACGGAT	GGAAGAGTGA	AGAGATAAGC	AAGTCAAGA
10301	AAAGTAACAA	CGAAGCTTCA	TCAGCTACAA	ATTTTGCCCC	AACGTGGTGC
10351	ACCAGCACCA	AACTTACGTA	TACATGATTA	TCTCTGTTTC	CCTCATTTTC
10401	AAGAAAAAAA	CGGGTTTCAA	AACCCACTGC	TTTCAGGAGT	AAAAAAGAT
10451	AATAATCTGA	AACATTGCTT	CCACCTTGGC	CCTTATTTGG	TTACGTTGCA
10501	ATTCACCCCA	ATCCACATGT	GGATTGAGAT	GGATTGCAGT	GTAGCTAGAC
10551	AAACCCTTAG	GCCCTGTTTG	CATAGGAATA	CACCAGGAAT	TATTCCAGCT
10601	AATCAAAATT	TATATAAATG	AGAGAAACAA	TCGGATAGG	AATTGTTCCA
10651	GGACTTCATT	CTGCAGTAAC	CGAACGGCCC	CTTAATCCAC	CCCAATACAC
10701	GTGGATTGGA	GTGGATTGAG	GTACAGCCAA	ACAAGGCCTA	AGTGCAGATC
10751	AAATAAATCA	CCCGTCATAT	TCTTCTACCT	ACAAAAACAG	CAATAAACAC
10801	CTGAATGAAG	TTCTAATTTG	CACAGTGTAG	GTAGGATGAA	AATAGTTACC
10851	TCCTCATGGT	CAGTAACTCT	TGGCACACAA	CTTCACATGT	AATCGATGTA
10901	CCACTTGGCT	CTTGCCTGAA	ACCCAATACA	TCTTTAGCAT	AAGAATAATA
10951	TTATGATGGC	AAGGCATGAT	CACCAGCACT	CCTTTATTGT	TTAGTAAAGT
11001	TATCACTCCC	CAAAACAATT	CAAAATGAACA	GAGATGCATT	GCCCCAATG
11051	AATTCTATTT	CAATTAGCCG	GAAAATTCTA	CTTCATCAGA	AGCATCCAAA
11101	TTGCCAGCAT	CCCTACTAGA	CTGACCATGA	CCAGGCTGCC	GCAGATGCCT
11151	CTTTTCTGT	CCTCTCCTCT	TGCGCTTGAG	TTTCTCTTCA	AGATCCCTCA
11201	CCCCACGTCT	CTTATACATC	TAAAGCTAA	CATGTCTCTC	CTCCGCCATC

11251	<u>TTCTAACCT TCTCAGTAAT CTCAGCAGCA ATCTGACGGT TGTACAACTT</u>
11301	<u>CTTCAGCCCC TTCATCAACT TTGCAAATGT GTCAGGCTGT GGCATCAGTC</u>
11351	<u>CTGCCTCTAG CATGTCTAAG CAATACAGGC AGGCCTCCTT GACATGTTTC</u>
11401	<u>TTGCAAACA GTGCATGAAT CCAGATAGTC CATGCACTCA CATTGAGCTC</u>
11451	<u>ACAGCCTTTG CTCACAATAC ATTTCCAAAC ATCCTTTGCA AGCTCAAGTT</u>
11501	<u>TCTCATCTCT GACCAACGCA TTGAGGAGGT CCTTCAGCAC CCCATATTGC</u>
11551	<u>GGTACCACAA AGAGCCCCCT CCCAACCATG TCTTTAAAT AACTACATGC</u>
11601	<u>CTCAATCAGC AAACCCTGCC CAACAAGGCC ACTCACCACG ATAGCAAATG</u>
11651	<u>TATCGACCAC AGGACTGAGC CCAGCACTTT CCATCTCATT CCACAATGTC</u>
11701	<u>ATGGCTTGCT TGGTCTCCCC AAGCCTGCAG GCCAACCGAA TCACCACATT</u>
11751	<u>GTATATCTTG AGATCTGGTG GACACCGCA CTCCGCATC CTCTCCATCA</u>
11801	<u>GCTCCAAGCA CTCCTCAAGC TGCTCCTTCT TCTCGTGTGC TACAAAGAAA</u>
11851	<u>CCATGGTACA CGGCAGCGTC CACCCGCAGG CCATCCCTCG ACATAGCATC</u>
11901	<u>CAAGAACTCG TACCCCTGGG AT</u>

Figure 2/3

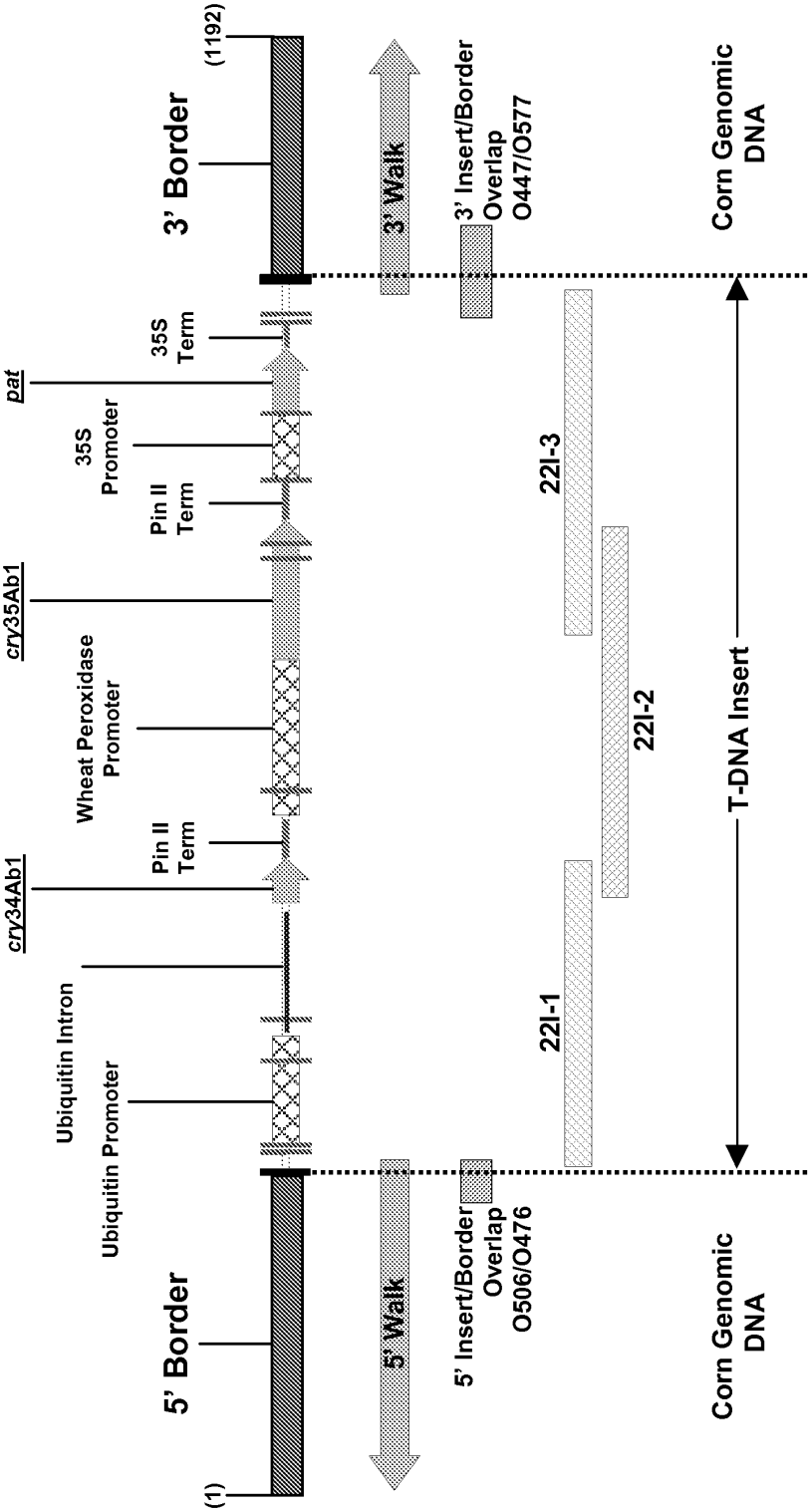
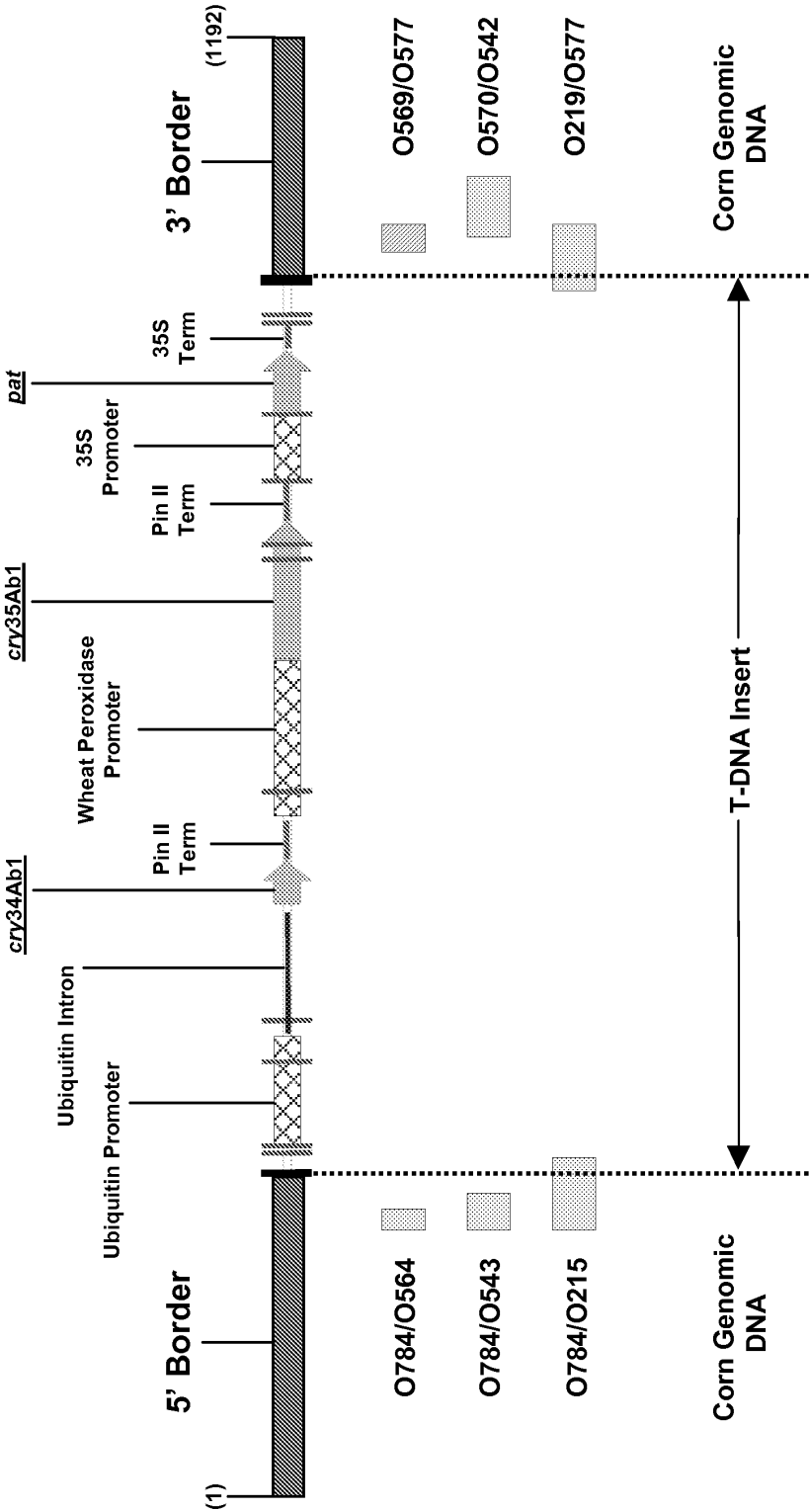


Figure 3/3





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.

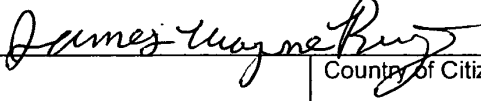
NUMBER	COUNTRY	MM/DD/YYYY FILED	PRIORITY CLAIMED	
			☐ Yes	☐ No
			☐ Yes	☐ No
			☐ Yes	☐ No

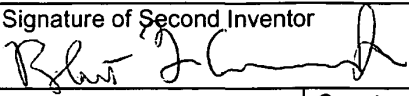
As a named inventor, I hereby appoint the practitioners associated with the Customer Number provided below to prosecute this application and transact all business in the Patent and Trademark Office connected therewith, and direct that all correspondence be addressed to that Customer Number:

Customer Number 27310

Direct telephone calls to: Louise A. Foutch
(515) 248-4835

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.

Full Name of First or Sole Inventor	Signature of First or Sole Inventor	Date
James Wayne Bing		12/1/05
Residence Address	Country of Citizenship	
Ankeny, Iowa	US	
Post Office Address		
275 NE 54th Street, Ankeny, Iowa 50021		

Full Name of Second Inventor	Signature of Second Inventor	Date
Robert F. Cressman, Jr.		11/7/05
Residence Address	Country of Citizenship	
Wilmington, DE	US	
Post Office Address		
2502 Turnstone Dr., Wilmington, DE 19805		

Full Name of Third Inventor	Signature of Third Inventor	Date
Manju Gupta	<i>Manju Gupta</i>	<i>12-05-05</i>
Residence Address	Country of Citizenship	
Carmel, IN	US	
Post Office Address		
13463 Winamac Court, Carmel, IN 46032		

Full Name of Fourth Inventor	Signature of Fourth Inventor	Date
Salim M. Hakimi	<i>Salim Hakimi</i>	11/10/05
Residence Address	Country of Citizenship	
Sacramento, CA	US	
Post Office Address		
171 Vista Creek Cr., Sacramento, CA 95835		

Full Name of Fifth Inventor	Signature of Fifth Inventor	Date
David Hondred	<i>David Hondred</i>	<i>11/9/05</i>
Residence Address	Country of Citizenship	
Altoona, IA	US	
Post Office Address		
9313 NE Reynolds Way, Altoona, IA 50009		

Full Name of Sixth Inventor	Signature of Sixth Inventor	Date
Todd L. Krone	<i>Todd L. Krone</i>	<i>11/3/05</i>
Residence Address	Country of Citizenship	
Johnston, IA	US	
Post Office Address		
9104 Telford Circle, Johnston, IA 50131		

Full Name of Seventh Inventor	Signature of Seventh Inventor	Date
Mary E. Hartnett Locke	<i>Mary E. Hartnett Locke</i>	11/7/2005
Residence Address	Country of Citizenship	
Mickleton, NJ	US	
Post Office Address		
31 Millwood Drive, Mickleton, NJ 08056		

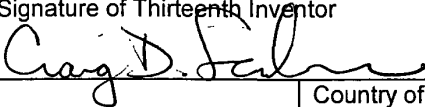
Full Name of Eighth Inventor	Signature of Eighth Inventor	Date
Abigail K. Luckring	<i>Abigail K. Luckring</i>	11/7/2005
Residence Address	Country of Citizenship	
West Chester, PA	US	
Post Office Address		
306 West Marshall Street, West Chester, PA 19380		

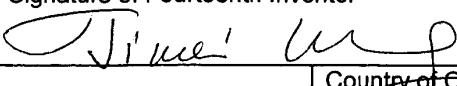
Full Name of Ninth Inventor	Signature of Ninth Inventor	Date
Sandra E. Meyer	<i>Sandra E. Meyer</i>	11/2/25
Residence Address	Country of Citizenship	
Des Moines, IA	US	
Post Office Address		
1311 – 46th Street, Des Moines, IA 50311		

Full Name of Tenth Inventor	Signature of Tenth Inventor	Date
Daniel Moellenbeck	<i>Daniel Moellenbeck</i>	11/4/05
Residence Address	Country of Citizenship	
Granger, IA	US	
Post Office Address		
11566 NW 107 th Ct., Granger, IA 50229		

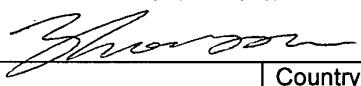
Full Name of Eleventh Inventor	Signature of Eleventh Inventor	Date
Kenneth Edwin Narva	<i>Kenneth E. Narva</i>	12-05-05
Residence Address	Country of Citizenship	
Zionsville, IN	US	
Post Office Address		
4372 Creekside Pass, Zionsville, IN 46077		

Full Name of Twelfth Inventor	Signature of Twelfth Inventor	Date
Paul D. Olson	<i>Paul D Olson</i>	<i>11-8-2003</i>
Residence Address	Country of Citizenship	
Kalaheo, HI	US	
Post Office Address		
4351 Puu Kulana Place, Kalaheo, HI 96741		

Full Name of Thirteenth Inventor	Signature of Thirteenth Inventor	Date
Craig D. Sanders		7-Nov 2005
Residence Address	Country of Citizenship	
Bear, DE	US	
Post Office Address		
15 Penny Lane, Bear, DE 19701		

Full Name of Fourteenth Inventor	Signature of Fourteenth Inventor	Date
Jimei Wang		11/15/05
Residence Address	Country of Citizenship	
Johnston, IA	US	
Post Office Address		
5611 Kensington Circle, Johnston, IA 50131		

Full Name of Fifteenth Inventor	Signature of Fifteenth Inventor	Date
Jian Zhang		11/4/05
Residence Address	Country of Citizenship	
Urbandale, IA	US	
Post Office Address		
6824 Mill Pond Drive, Urbandale, IA 50322		

Full Name of Sixteenth Inventor	Signature of Sixteenth Inventor	Date
Gan-Yuan Zhong		11/3/05
Residence Address	Country of Citizenship	
Urbandale, IA	US	
Post Office Address		
4612 - 93rd Street, Urbandale, IA 50322		

Application Data Sheet

Application Information

Application Type::	Regular
Subject Matter::	Utility
Suggested Classification::	
Suggested Group Art Unit::	
CD-ROM or CD-R?::	
Number of CD disks::	
Number of copies of CDs::	
Sequence submission?::	Electronic
Computer Readable Form (CRF)?::	
Number of copies of CRF::	
Title::	Corn Event DAS-59122-7 and Methods for Detection Thereof
Attorney Docket Number::	1895D4
Request for Early Publication?::	No
Request for Non-Publication?::	No
Suggested Drawing Figure::	02
Total Drawing Sheets::	07
Small Entity::	
Petition included?::	
Secrecy Order in Parent Appl.?::	No

Applicant Information:

Applicant Authority type::	Inventor
Primary Citizenship Country::	US
Status::	Full Capacity
Given Name::	James
Middle Name::	Wayne
Family Name::	Bing

1

Initial 11/12/2007

City of Residence:: Ankeny
State or Province of Residence:: IA
Country of Residence:: US
Street of mailing address:: 275 NE 54th Street
City of mailing address:: Ankeny
State or Province of mailing address:: IA
Postal or Zip Code of mailing address:: 50021

Applicant Information:

Applicant Authority type:: Inventor
Primary Citizenship Country:: US
Status:: Full Capacity
Given Name:: Robert
Middle Name:: F.
Family Name:: Cressman
Name Suffix:: Jr.
City of Residence:: Wilmington
State or Province of Residence:: DE
Country of Residence:: US
Street of mailing address:: 2502 Turnstone Dr.
City of mailing address:: Wilmington
State or Province of mailing address:: DE
Postal or Zip Code of mailing address:: 19380

Applicant Information:

Applicant Authority type:: Inventor
Primary Citizenship Country:: US
Status:: Full Capacity
Given Name:: Manju
Middle Name::
Family Name:: Gupta

City of Residence:: Carmel
State or Province of Residence:: IN
Country of Residence:: US
Street of mailing address:: 13463 Winamac Court
City of mailing address:: Carmel
State or Province of mailing address:: IN
Postal or Zip Code of mailing address:: 46032

Applicant Information:

Applicant Authority type:: Inventor
Primary Citizenship Country:: US
Status:: Full Capacity
Given Name:: Salim
Middle Name:: M.
Family Name:: Hakimi
City of Residence:: Sacramento
State or Province of Residence:: CA
Country of Residence:: US
Street of mailing address:: 171 Vista Creek Cr.
City of mailing address:: Sacramento
State or Province of mailing address:: CA
Postal or Zip Code of mailing address:: 95835

Applicant Information:

Applicant Authority type:: Inventor
Primary Citizenship Country:: US
Status:: Full Capacity
Given Name:: David
Middle Name::
Family Name:: Hondred
City of Residence:: Altoona

State or Province of Residence:: IA
Country of Residence:: US
Street of mailing address:: 9313 NE Reynolds Way
City of mailing address:: Altoona
State or Province of mailing address:: IA
Postal or Zip Code of mailing address:: 50009

Applicant Information:

Applicant Authority type:: Inventor
Primary Citizenship Country:: US
Status:: Full Capacity
Given Name:: Todd
Middle Name:: L.
Family Name:: Krone
City of Residence:: Johnston
State or Province of Residence:: IA
Country of Residence:: US
Street of mailing address:: 9104 Telford Circle
City of mailing address:: Johnston
State or Province of mailing address:: IA
Postal or Zip Code of mailing address:: 50131

Applicant Information:

Applicant Authority type:: Inventor
Primary Citizenship Country:: US
Status:: Full Capacity
Given Name:: Mary
Middle Name:: E.
Family Name:: Hartnett Locke
City of Residence:: Mickleton
State or Province of Residence:: NJ

Country of Residence:: US
Street of mailing address:: 31 Millwood Drive
City of mailing address:: Mickleton
State or Province of mailing address:: NJ
Postal or Zip Code of mailing address:: 08056

Applicant Information:

Applicant Authority type:: Inventor
Primary Citizenship Country:: US
Status:: Full Capacity
Given Name:: Abigail
Middle Name:: K.
Family Name:: Luckring
City of Residence:: West Chester
State or Province of Residence:: PA
Country of Residence:: US
Street of mailing address:: 306 West Marshall Street
City of mailing address:: West Chester
State or Province of mailing address:: PA
Postal or Zip Code of mailing address:: 19380

Applicant Information:

Applicant Authority type:: Inventor
Primary Citizenship Country:: US
Status:: Full Capacity
Given Name:: Sandra
Middle Name:: E.
Family Name:: Meyer
City of Residence:: Des Moines
State or Province of Residence:: IA
Country of Residence:: US

Street of mailing address:: 1311 – 46th Street
City of mailing address:: Des Moines
State or Province of mailing address:: IA
Postal or Zip Code of mailing address:: 50311

Applicant Information:

Applicant Authority type:: Inventor
Primary Citizenship Country:: US
Status:: Full Capacity
Given Name:: Daniel
Middle Name::
Family Name:: Moellenbeck
City of Residence:: Granger
State or Province of Residence:: IA
Country of Residence:: US
Street of mailing address:: 11566 NW 107th Ct.
City of mailing address:: Granger
State or Province of mailing address:: IA
Postal or Zip Code of mailing address:: 50229

Applicant Information:

Applicant Authority type:: Inventor
Primary Citizenship Country:: US
Status:: Full Capacity
Given Name:: Kenneth
Middle Name:: Edwin
Family Name:: Narva
City of Residence:: Zionsville
State or Province of Residence:: IN
Country of Residence:: US
Street of mailing address:: 4372 Creekside Pass

City of mailing address:: Zionsville
State or Province of mailing address:: IN
Postal or Zip Code of mailing address:: 46077

Applicant Information:

Applicant Authority type:: Inventor
Primary Citizenship Country:: US
Status:: Full Capacity
Given Name:: Paul
Middle Name:: D.
Family Name:: Olson
City of Residence:: Kalaheo
State or Province of Residence:: HI
Country of Residence:: US
Street of mailing address:: 4351 Puu Kulana Place
City of mailing address:: Kalaheo
State or Province of mailing address:: HI
Postal or Zip Code of mailing address:: 96741

Applicant Information:

Applicant Authority type:: Inventor
Primary Citizenship Country:: US
Status:: Full Capacity
Given Name:: Craig
Middle Name:: D.
Family Name:: Sanders
City of Residence:: Bear
State or Province of Residence:: DE
Country of Residence:: US
Street of mailing address:: 15 Penny Lane
City of mailing address:: Bear

State or Province of mailing address:: DE
Postal or Zip Code of mailing address:: 19701

Applicant Information:

Applicant Authority type:: Inventor
Primary Citizenship Country:: US
Status:: Full Capacity
Given Name:: Jimei
Middle Name::
Family Name:: Wang
City of Residence:: Johnston
State or Province of Residence:: IA
Country of Residence:: US
Street of mailing address:: 5611 Kensington Circle
City of mailing address:: Johnston
State or Province of mailing address:: IA
Postal or Zip Code of mailing address:: 50131

Applicant Information:

Applicant Authority type:: Inventor
Primary Citizenship Country:: US
Status:: Full Capacity
Given Name:: Jian
Middle Name::
Family Name:: Zhang
City of Residence:: Urbandale
State or Province of Residence:: IA
Country of Residence:: US
Street of mailing address:: 6824 Mill Pond Drive
City of mailing address:: Urbandale
State or Province of mailing address:: IA

Postal or Zip Code of mailing address:: 50322

Applicant Information:

Applicant Authority type:: Inventor
Primary Citizenship Country:: US
Status:: Full Capacity
Given Name:: Gan-Yuan
Middle Name::
Family Name:: Zhong
City of Residence:: Urbandale
State or Province of Residence:: IA
Country of Residence:: US
Street of mailing address:: 4612 – 93rd Street
City of mailing address:: Urbandale
State or Province of mailing address:: IA
Postal or Zip Code of mailing address:: 50322

Correspondence Information

Correspondence Customer Number:: 27310

Representative Information

Representative Customer Number:: 27310

Domestic Priority Information

Application::	Continuity Type::	Parent Application::	Parent Filing Date::
This application	Division of	11/237,222	09/28/2005
11/237,222	An application claiming the benefit under 35 USC 119(e)	60/614,225	09/29/2004

Assignee Information

Assignee Name::	Pioneer Hi-Bred International, Inc.
Assignee Name::	Dow AgroSciences LLC
Assignee Name::	E.I. DuPont deNemours and Company

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No. : Confirmation No. :
Applicant : James Wayne Bing, et al.
Filed : November 12, 2007
TC/A.U. :
Examiner :
Docket No. : 1895D4
Customer No. : 27310
Title : Corn Event DAS-59122-7 and Methods for Detection
Thereof

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

STATEMENT TO SUPPORT FILING OF SEQUENCE LISTING

I hereby state that the content of the Sequence Listing text file electronically filed with the above-referenced application does not contain new matter that extends beyond the original disclosure. The Sequence Listing is herein incorporated by reference into application as filed.

Respectfully submitted,

/Claire L. Moxon/
Claire L. Moxon, Reg. # 57,557

PIONEER HI-BRED INTERNATIONAL, INC.
Corporate Intellectual Property
7250 N.W. 62nd Avenue
P.O. Box 552
Johnston, Iowa 50131-0552
Phone: (515) 253-2162
Facsimile: (515) 334-6883

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

Substitute for form 1449A/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary)			Complete if Known	
	Application Number			
	Filing Date	11/12/2007		
	First Named Inventor	James Wayne Bing		
	Art Unit			
	Examiner Name			
Sheet	1	of	1	Attorney Docket Number
				1895D4

U.S. PATENT DOCUMENTS					
Examiner Initials *	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number - Kind Code ² (if known)			
	A1	US-6,395,485	05-28-2002	Marc DeBeuckeleer	Entire document

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No. ¹	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T ⁶
		Country Code ³ - Number ⁴ - Kind Code ⁵ (if known)				
	A2	WO 2004/011601 A2	02-05-2004	Monsanto Technology, LLC	Entire document	
	A3	EP 1 167 531 A1	02-01-2002	Monsanto Technology, LLC	Entire document	
	A4	WO 84/02913	08-02-1984	Monsanto Company	Entire document	
	A5	WO 01/14417	03-01-2001	Mycogen Corporation	Entire document	
	A6	WO 03/052073	06-26-2003	Syngenta Participations AG	Entire document	
	A7	WO 2002/15701	02-28-2002	Syngenta Participations Ag	Entire document	

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials *	Cite No. ¹	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.	T ²
	A8	KARIN RICKER, Biotechnology Consultation Note to the File BNF No. 000081, U.S. Food and Drug Administration, (2004), Pages 1-6, XP002384225	
	A9	HUNST AND ROOD, Application for the Determination of Nonregulated Status for <i>B.t.</i> Cry34/35Ab1 Insect-Resistant, Glufosinate-Tolerant Corn: Corn Line 59122, U.S. Department of Agriculture, Animal and Plant Health Inspection Service, (2004), Pages 1-237, XP 002384226	
	A10	WHITELAW, ET AL., PUFTW67TB ZM_0.6_1.0_KB Zea mays genomic clone ZMMBTa0732K13, genomic survey sequence, (2003), EMBL Accession No. CG069192	
	A11	ELLIS, ET AL., Novel <i>Bacillus thuringiensis</i> Binary Insecticidal Crystal Proteins Active on Western corn Rootworm, <i>Diabrotica virgifera virgifera</i> LeConte, App and Envir Microbiology, 68(3): 1137-1145, XP002985898	

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

*EXAMINER: Include 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. ¹ Applicant's unique citation designation number (optional). ² See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. ³ Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. ⁶ Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. 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 2 hours 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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No. :
Applicant : James Wayne Bing, et al.
Filed : November 12, 2007
TC/A.U. :
Examiner :
Docket No. : 1895D4
Title : Corn Event DAS-59122-7 and Methods for Detection
Thereof

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

STATEMENT REGARDING SEQUENCES

The following statement is intended to provide information to the Examiner about the sequences of the invention and how they are positioned in the transformation event of the invention. The attached appendices were submitted to Examiner Kubelik in the parent application (Application Serial No. 11/237,222) in order to assist with explaining the function and importance of each sequence. It is believed that these appendices were helpful to the Examiner and thus they are resubmitted in an effort to assist with prosecution of divisional applications.

No new matter is presented in the appendices.

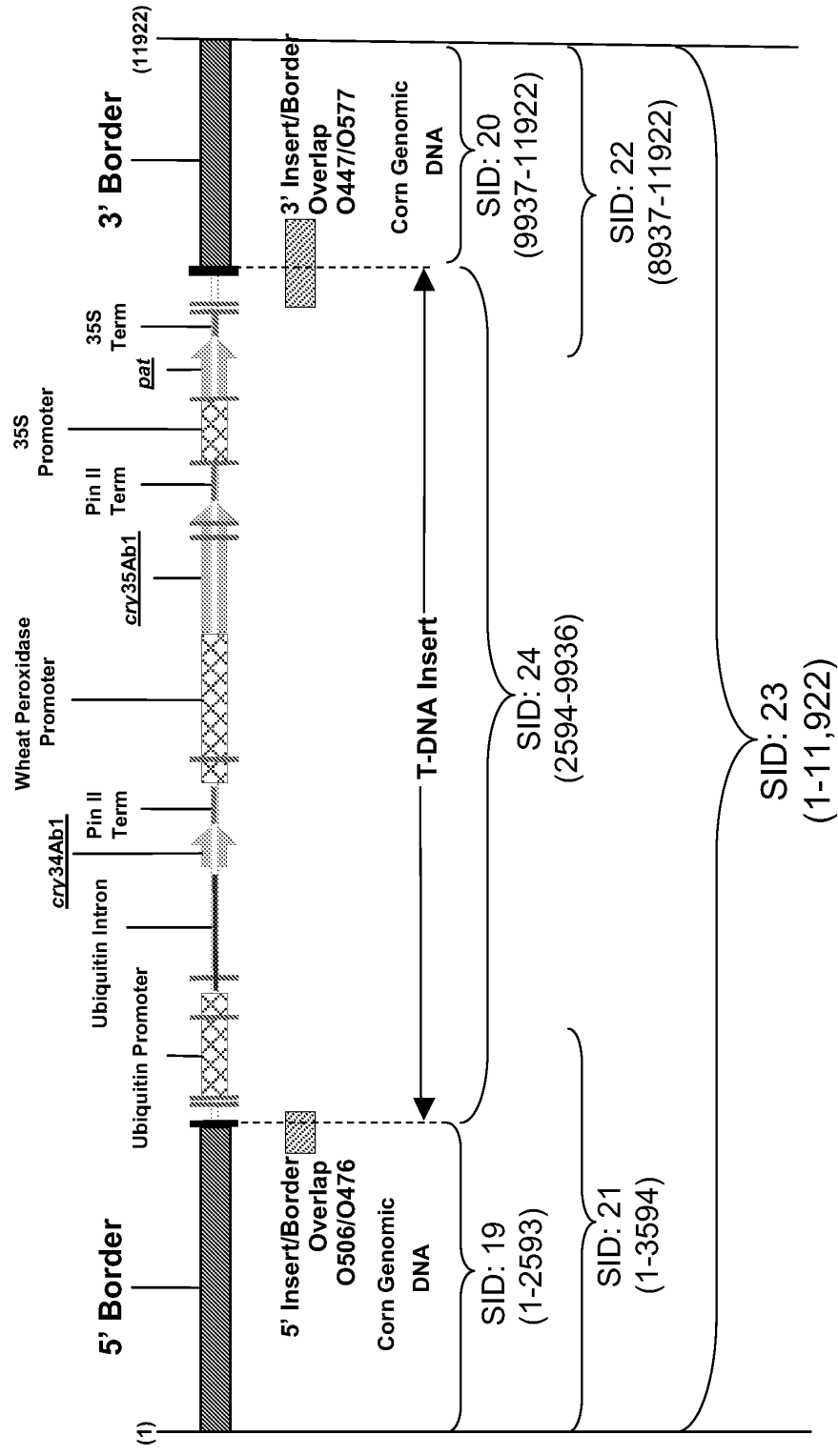
If the Examiner has any questions regarding these explanations or the information provided herein, it is respectfully requested that the Examiner telephone the undersigned agent so that further examination of this application can be expedited.

Respectfully submitted,

/Claire L. Moxon/
Claire L. Moxon, Reg. # 57,557

PIONEER HI-BRED INTERNATIONAL, INC.
Corporate Intellectual Property
7100 N.W. 62nd Avenue
P.O. Box 1000
Johnston, Iowa 50131-1000
Phone: (515) 253-2162
Facsimile: (515) 334-6883

Appendix A



Appendix B

Primer Sequences (SEQ ID Nos: 1-18, 36, 37, 39, 40)		
SEQ ID No:	Description	Position on SEQ ID No: 23
1	O215 primer (reverse)	2743-2716
2	O219 primer (forward)	9830-9858
3	O227 primer (reverse)	9846-9827
4	O370 primer (forward)	4871-4894
5	O371 primer (reverse)	5187-5163
6	O372 primer (forward)	7017-7044
7	O373 primer (reverse)	7897-7873
8	O447 primer (forward)	9623-9645
9	O476 primer (reverse)	2739-2714
10	O506 primer (forward)	2427-2451
11	O514 primer (forward)	2687-2709
12	O542 primer (reverse)	10766-10742
13	O543 primer (reverse)	2451-2427
14	O564 primer (reverse)	2324-2299
15	O569 primer (forward)	10150-10174
16	O570 primer (forward)	10275-10299
17	O577 primer (reverse)	10376-10352
18	O784 primer (forward)	2189-2213
36	67609 primer (forward)	9862-9886
37	69240 primer (forward)	9941-9967
39	IVR1 primer (used to generate a 226 bp amplicon to be used as an internal positive control)	n/a
40	IVR2 primer (used to generate a 226 bp amplicon to be used as an internal positive control)	n/a

Event sequences – borders and insert (SEQ ID Nos: 19-24)		
SEQ ID No:	Description	Position on SEQ ID No: 23
19	5' border sequence, genomic maize DNA	1-2593
20	3' border sequence, genomic maize DNA	9937-11922
21	5' border sequence plus beginning of insert, spans unique junction point of event	1-3594
22	3' border sequence plus end of insert, spans unique junction point of event	8936-11922
23	Entire event – 5' border, insert, 3' border	1-11922 (all)
24	t-DNA insert	2594-9936

Amplicon sequences made using primers (SEQ ID Nos: 25-35, 38)		
SEQ ID No:	Description	Position on SEQ ID No: 23
25	Amplicon 22I-1, 2501 bp, within tDNA insert, made with primers of SEQ ID NOs: 11 and 5	2687-5187
26	Amplicon 22I-2, 3027 bp, within tDNA insert, made with primers of SEQ ID NOs: 4 and 7	4871-7897
27	Amplicon 22I-3, 2830 bp, within tDNA insert, made with primers of SEQ ID NOs: 6 and 3	7017-9846
28	Amplicon of 136 bp made with primers of SEQ ID NOs: 18 and 14, within 5' genomic DNA border	2189-2324
29	Amplicon of 263 bp made with primers of SEQ ID NOs: 18 and 13, within 5' genomic DNA border	2189-2451
30	Amplicon of 227 bp made with primers of SEQ ID NOs: 15 and 17, within 3' genomic DNA border	10150-10376
31	Amplicon of 492 bp made with primers of SEQ ID NOs: 16 and 12, within 3' genomic DNA border	10275-10766
32	Amplicon of 555 bp made with primers of SEQ ID NOs: 18 and 1, spans unique junction of 5' border with tDNA insert	2189-2743
33	Amplicon of 547 bp made with primers of SEQ ID NOs: 2 and 17, spans unique junction of 3' border with tDNA insert	9830-10376
34	Amplicon of 313 bp made with primers of SEQ ID NOs: 10 and 9, spans unique junction of 5' border with tDNA insert	2427-2739
35	Amplicon of 754 bp made with primers of SEQ ID NOs: 8 and 17, spans unique junction of 3' border with tDNA insert	9623-10376
38	Amplicon of 104 bp made with primers of SEQ ID NOs: 36 and 37, spans unique junction of 3' border with tDNA insert	9862-9965

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:		Claire L. Moxon/Ginny Boesen		
Attorney Docket Number:		1895D4		
Filed as Large Entity				
Utility Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Utility application filing	1011	1	310	310
Utility Search Fee	1111	1	510	510
Utility Examination Fee	1311	1	210	210
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				1030

Electronic Acknowledgement Receipt

EFS ID:	2453672
Application Number:	11938359
International Application Number:	
Confirmation Number:	3820
Title of Invention:	Corn Event DAS-59122-7 and Methods for Detection Thereof
First Named Inventor/Applicant Name:	James Wayne Bing
Customer Number:	27310
Filer:	Claire L. Moxon/Ginny Boesen
Filer Authorized By:	Claire L. Moxon
Attorney Docket Number:	1895D4
Receipt Date:	12-NOV-2007
Filing Date:	
Time Stamp:	12:18:49
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	\$ 1030
RAM confirmation Number	6186
Deposit Account	161852
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 1.17 (Patent application and reexamination processing 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	1895D4_Utility_Transmittal.pdf	112783 2ef14ae430b021ed7cbdd9bb8f815d5d52594a9d	no	1
Warnings:					
Information:					
2		1895D4_App.pdf	278323 988e7402629cad80369ee75c1fa047e424755195	yes	43
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Specification		1	41	
	Application Data Sheet		42	42	
	Abstract		43	43	
Warnings:					
Information:					
3	Drawings-only black and white line drawings	1895D4_Figure_1.pdf	93328 419111dadf76121b732faf2a9904ae345242f30e	no	5
Warnings:					
Information:					
4	Drawings-other than black and white line drawings	1895D4_Figs_2and3.pdf	113435 8f0b90da6b1952f3f526505efe48d8da90945b8f	no	2
Warnings:					
Information:					
5	Oath or Declaration filed	1895D4_Declaration.pdf	188830 e8cbe96540a4c6f8f1f5b7379d3a090a874b95cd8	no	13
Warnings:					
Information:					
6	Application Data Sheet	1895D4_App_Data_Sheet.pdf	70643 590b5bc927a8f5bba5b8a83d064a053899717041	no	10
Warnings:					
Information:					
This is not an USPTO supplied ADS fillable form					

7	CRF Statement Paper and CRF are the same	1895D4_Seq_List_Statements.pdf	70697	no	1
			eb0251924882bad4bc7292ad3a8b3516a68fe7e4		
Warnings:					
Information:					
8	Sequence Listing (Text File)	1895D4_SEQLIST.TXT	58626	no	0
Warnings:					
Information:					
9	Information Disclosure Statement Letter	1895D4_IDS_No_Copies.pdf	59845	no	2
			000f5f0e7731254dcf52c8cf2012aac79bc684c0		
Warnings:					
Information:					
10	Information Disclosure Statement (IDS) Filed	1895D4_Form_1449.pdf	124806	no	1
			fd82edb69f7b6be184a265152a341cbd7d36e957		
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
11	Miscellaneous Incoming Letter	1895D4_Statement_re_sequences.pdf	71268	no	2
			34c4f6365c7a8ab7782b87cd8a408d38f4c21d88		
Warnings:					
Information:					
12	Miscellaneous Incoming Letter	1895D4_Statement_Appendices.pdf	38939	no	3
			ad65567502d291f62ed7831529c8dbc4a7d4ed95		
Warnings:					
Information:					
13	Fee Worksheet (PTO-06)	fee-info.pdf	8366	no	2
			872508d76f789397c9b4a00a8953b8cfd1576eec		
Warnings:					
Information:					
Total Files Size (in bytes):			1289889		

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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No. : Confirmation No. :
Applicant : James Wayne Bing, et al.
Filed : 11/12/2007
Examiner :
Docket No. : 1895D4
Customer No. : 27310
Title : Corn Event DAS-59122-7 and Methods for Detection
Thereof

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

**FILING OF AN INFORMATION DISCLOSURE STATEMENT
UNDER 37 CFR §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 CFR §1.97 and Section 609 of the MPEP. By submitting the listed documents, Applicant in no way makes any admission as to the prior art status of the listed documents, but is instead submitting the listed documents for the sake of full disclosure.

Any foreign patents or non-patent literature documents are attached except those that were supplied in, or cited by the Office during prosecution of, parent Application No. 11/237,222, filed 09/28/2005. Since the benefit of this application was claimed under 35 USC 120, no copies need to be furnished in accordance with 37 CFR §1.98(d); however, copies will be furnished on request.

Respectfully submitted,

/Claire L. Moxon/
Claire L. Moxon, Reg. # 57,557

PIONEER HI-BRED INTERNATIONAL, INC.
Corporate Intellectual Property
7250 N.W. 62nd Avenue
P.O. Box 552
Johnston, Iowa 50131-0552
Phone: (515) 253-2162
Facsimile: (515) 334-6883

Filing Date: 11/12/2007

PTO/SB/06 (12-04)

Approved for use through 7/31/2006. 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 11/938,359					
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	310		
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A		N/A			N/A	510		
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A		N/A			N/A	210		
TOTAL CLAIMS (37 CFR 1.16(i))	3	*		X 25=		OR	X 50=			
INDEPENDENT CLAIMS (37 CFR 1.16(h))	1	*		X 100=			X 200=			
APPLICATION SIZE FEE (37 CFR 1.16(s))			If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$250 (\$125 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))				N/A			N/A			
				TOTAL			TOTAL	1,030		
* 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		OR	OTHER THAN SMALL ENTITY	
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 =		OR	
	Independent (37 CFR 1.16(h))	*	Minus ***	=	X =		X =		OR	
	Application Size Fee (37 CFR 1.16(s))				N/A		N/A		OR	
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))				TOTAL ADD'T FEE		TOTAL ADD'T FEE		OR	
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
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 =		OR	
	Independent (37 CFR 1.16(h))	*	Minus ***	=	X =		X =		OR	
	Application Size Fee (37 CFR 1.16(s))				N/A		N/A		OR	
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))				TOTAL ADD'T FEE		TOTAL ADD'T FEE		OR	
* 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.

=====

Sequence Listing could not be accepted due to errors.

See attached Validation Report.

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

Reviewer: markspencer

Timestamp: [year=2007; month=12; day=5; hr=10; min=27; sec=35; ms=431;]

=====

Reviewer Comments:

tgctccttct tctcgtgtgc tacaaagaaa ccatggtaca cggcagcgtc caccgcagg 11880
ccatccctcg acatagcatc caagaactcg taccctggg at

11922<210> 24

<211> 7390

<212> DNA

<213> Artificial Sequence

tgcaagcgct caattcgccc tatagtgagt cgtattacaa tcgtacgcaa ttcagtacat 7320
taaaaacgtc cgcaatgtgt tattaagttg tctaagcgtc aatttgttta caccacaata 7380
tatcctgcca

7390<210> 25

<211> 2501

<212> DNA

<213> Artificial Sequence

Please insert a hard break after SEQ ID # 23 and 24.

Application No:

11938359

Version No:

1.0

Input Set:

Output Set:

Started: 2007-11-12 12:20:09.227
Finished: 2007-11-12 12:20:13.681
Elapsed: 0 hr(s) 0 min(s) 4 sec(s) 454 ms
Total Warnings: 40
Total Errors: 25
No. of SeqIDs Defined: 40
Actual SeqID Count: 38

Error code	Error Description
W 213	Artificial or Unknown found in <213> in SEQ ID (1)
W 213	Artificial or Unknown found in <213> in SEQ ID (2)
W 213	Artificial or Unknown found in <213> in SEQ ID (3)
W 213	Artificial or Unknown found in <213> in SEQ ID (4)
W 213	Artificial or Unknown found in <213> in SEQ ID (5)
W 213	Artificial or Unknown found in <213> in SEQ ID (6)
W 213	Artificial or Unknown found in <213> in SEQ ID (7)
W 213	Artificial or Unknown found in <213> in SEQ ID (8)
W 213	Artificial or Unknown found in <213> in SEQ ID (9)
W 213	Artificial or Unknown found in <213> in SEQ ID (10)
W 213	Artificial or Unknown found in <213> in SEQ ID (11)
W 213	Artificial or Unknown found in <213> in SEQ ID (12)
W 213	Artificial or Unknown found in <213> in SEQ ID (13)
W 213	Artificial or Unknown found in <213> in SEQ ID (14)
W 213	Artificial or Unknown found in <213> in SEQ ID (15)
W 213	Artificial or Unknown found in <213> in SEQ ID (16)
W 213	Artificial or Unknown found in <213> in SEQ ID (17)
W 213	Artificial or Unknown found in <213> in SEQ ID (18)
W 213	Artificial or Unknown found in <213> in SEQ ID (19)
W 213	Artificial or Unknown found in <213> in SEQ ID (20)

Input Set:

Output Set:

Started: 2007-11-12 12:20:09.227
Finished: 2007-11-12 12:20:13.681
Elapsed: 0 hr(s) 0 min(s) 4 sec(s) 454 ms
Total Warnings: 40
Total Errors: 25
No. of SeqIDs Defined: 40
Actual SeqID Count: 38

Error code	Error Description
	This error has occurred more than 20 times, will not be displayed
E 259	Found undefined lettercode; POS (11923) SEQID(23)
E 259	Found undefined lettercode; POS (11924) SEQID(23)
E 259	Found undefined lettercode; POS (11925) SEQID(23)
E 259	Found undefined lettercode; POS (11926) SEQID(23)
E 259	Found undefined lettercode; POS (11927) SEQID(23)
E 259	Found undefined lettercode; POS (11928) SEQID(23)
E 259	Found undefined lettercode; POS (11929) SEQID(23)
E 259	Found undefined lettercode; POS (11930) SEQID(23)
E 259	Found undefined lettercode; POS (11931) SEQID(23)
E 259	Found undefined lettercode; POS (11932) SEQID(23)
E 254	The total number of bases conflicts with running total, Input: 24, Calculated : 11932 SEQID(23)
E 253	The number of bases differs from <211> Input: 11922 Calculated:11932 SEQID (23)
E 259	Found undefined lettercode; POS (7391) SEQID(23)
E 259	Found undefined lettercode; POS (7392) SEQID(23)
E 259	Found undefined lettercode; POS (7393) SEQID(23)
E 259	Found undefined lettercode; POS (7394) SEQID(23)
E 259	Found undefined lettercode; POS (7395) SEQID(23)
E 259	Found undefined lettercode; POS (7396) SEQID(23)
E 259	Found undefined lettercode; POS (7397) SEQID(23)
E 259	Found undefined lettercode; POS (7398) SEQID(23)

Input Set:

Output Set:

Started: 2007-11-12 12:20:09.227
Finished: 2007-11-12 12:20:13.681
Elapsed: 0 hr(s) 0 min(s) 4 sec(s) 454 ms
Total Warnings: 40
Total Errors: 25
No. of SeqIDs Defined: 40
Actual SeqID Count: 38

Error code	Error Description
E 259	Found undefined lettercode; POS (7399) SEQID(23)
E 254	The total number of bases conflicts with running total, Input: 25, Calculated : 7399 SEQID(23)
E 253	The number of bases differs from <211> Input: 7390 Calculated:7399 SEQID (23)
E 212	Invalid Sequence ID Number; Expected 24 as next SeqID but skipped
E 252	Calc# of Seq. differs from actual; 40 seqIds defined; count=38

SEQUENCE LISTING

<110> Bing, James Wayne
 Cressman, Jr., Robert F.
 Gupta, Manju
 Hakimi, Salim M.
 Hartnett Locke, Mary E.
 Hondred, David
 Krone, Todd L.
 Luckring, Abigail K.
 Meyer, Sandra E.
 Moellenbeck, Daniel
 Narva, Kenneth Edwin
 Olson, Paul D.
 Sanders, Craig D.
 Wang, Jimei
 Zhang, Jian
 Zhong, Gan-Yuan

<120> CORN EVENT DAS-59122-7 AND METHODS FOR
 DETECTION THEREOF

<130> 1895D4

<140> 11938359

<141> 2007-11-12

<150> 11/237,222

<151> 2005-09-28

<150> 60/614,225

<151> 2004-09-29

<160> 40

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 28

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide primer

<400> 1

gtggctcctt caacgttgcg gttctgtc

28

<210> 2

<211> 29

<212> DNA

<213> Artificial Sequence

<220>
 <223> Oligonucleotide primer

 <400> 2
 cgtgcaagcg ctcaattcgc cctatagtg 29

 <210> 3
 <211> 20
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Oligonucleotide primer

 <400> 3
 aattgagcgc ttgcacgttt 20

 <210> 4
 <211> 24
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Oligonucleotide primer

 <400> 4
 aacaacaaga ccggccacac cctc 24

 <210> 5
 <211> 25
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Oligonucleotide primer

 <400> 5
 gagtggtct ggatggtgta ggtca 25

 <210> 6
 <211> 28
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Oligonucleotide primer

 <400> 6
 tacaacctca agtggttect ctteccga 28

 <210> 7
 <211> 25
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Oligonucleotide primer

<400> 7	
gaggtctgga tctgcatgat gcgga	25
<210> 8	
<211> 23	
<212> DNA	
<213> Artificial Sequence	
<220>	
<223> Oligonucleotide primer	
<400> 8	
aacccttagt atgtatttgt att	23
<210> 9	
<211> 26	
<212> DNA	
<213> Artificial Sequence	
<220>	
<223> Oligonucleotide primer	
<400> 9	
ctccttcaac gttgcggttc tgtcag	26
<210> 10	
<211> 25	
<212> DNA	
<213> Artificial Sequence	
<220>	
<223> Oligonucleotide primer	
<400> 10	
ttttgcaaag cgaacgattc agatg	25
<210> 11	
<211> 23	
<212> DNA	
<213> Artificial Sequence	
<220>	
<223> Oligonucleotide primer	
<400> 11	
gcgggacaag ccgttttacg ttt	23
<210> 12	
<211> 25	
<212> DNA	
<213> Artificial Sequence	
<220>	
<223> Oligonucleotide primer	
<400> 12	

gacgggtgat ttatttgatc tgcac	25
<210> 13	
<211> 25	
<212> DNA	
<213> Artificial Sequence	
<220>	
<223> Oligonucleotide primer	
<400> 13	
catctgaatc gttcgctttg caaaa	25
<210> 14	
<211> 26	
<212> DNA	
<213> Artificial Sequence	
<220>	
<223> Oligonucleotide primer	
<400> 14	
ctacgttcca atggagctcg actgtc	26
<210> 15	
<211> 25	
<212> DNA	
<213> Artificial Sequence	
<220>	
<223> Oligonucleotide primer	
<400> 15	
ggtcaagtgg acacttggtc actca	25
<210> 16	
<211> 25	
<212> DNA	
<213> Artificial Sequence	
<220>	
<223> Oligonucleotide primer	
<400> 16	
gagtgaagag ataagcaagt caaag	25
<210> 17	
<211> 25	
<212> DNA	
<213> Artificial Sequence	
<220>	
<223> Oligonucleotide primer	
<400> 17	
catgtatacg taagtttggt gctgg	25

<210> 18
 <211> 25
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Oligonucleotide primer

<400> 18
 aatccacaag attggagcaa acgac 25

<210> 19
 <211> 2593
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> 5' flanking sequence of DAS 59122-7.

<400> 19
 ctgagcgcac aacagcagagt cgcattggcac cggacgacat gagcagagatt tagatcggag 60
 ggtgcggaca tggggcaacc tgcgcagcta acgcagggat ccacacgacc accaacgaag 120
 ccaagcccg gacagtcacc aggcaggttg ggccctggtt ccaccagcgg atgcatgcag 180
 tgaagcgggg acggagagac aagccgaggg cgcgggtggg aatggcgtcc gggaggacga 240
 gtggaggaga agaattctaga ggcattcaga ttcgagaagc cgacggagac aagattcgtg 300
 tggggggaga caaacccggg ggtcagcgc cgttgatatg ggatcagacg gtgtggataa 360
 aaaaagtgc gttgatagaa cgtctggcca gtgaaaaaac aaaacaactc caacaaaata 420
 ctttaaaagc tcttatacc taaatgtagg ggatcaaac cgtctctaca ctatttagca 480
 gcgtcctcta aatgatcctc taaattttaga gaacgctact agattctcta tatatagttt 540
 ctctaaccga tcttttatcc atttaaatac tttaaataac cggtttaaca aaactaaaat 600
 atatacaata catttgagag tatgacaaat acgtatgtat aaaaataaaa aataaaaata 660
 tgtatttagtc tactttgaat cttcttttct tcataatata atgatgtata gctctcatgt 720
 gcgttgagaa aaaagttaga gctagacgtt taatgtgtag tgacagtctt cgacgaaatc 780
 tcctaatga gatgaattac tggaggttcc atcagaaaag cccctgaaaa gaggcattta 840
 tttagtttag tcagcaattt ctgggaacac aaatattctt ttgttatcac cactatttaa 900
 aatctatggt tataacttat aataacatga aaaaataatt tagcatecca tatatataaa 960
 aactgaagga agccatatat actaacataa gttaggagaa actaagaagg ttgtgcaaag 1020
 cttgcactgc tccaaaatac tgcaaacac cactctctc taccacaaca agaaactcat 1080
 gtactccctc cgttcttttt tatttgtcgc attttagttt aaaaatgaac tagcagtcga 1140
 caaatattcg agaacagata tagtatatac taacataact taggagatac taagaaagt 1200
 gcgcagagct ttcactgttc caaattactg caaagcctct cccctctgcc agtacatcta 1260
 cgagatgttt cagttaaaca aagattcaga caagtgatga gccacttctt gtcatagatt 1320
 gtgtggtcaa ccaaccatt gatgccacgg tttttgtgca tccatgcttt tgtattaaaa 1380
 catcagttat gtttaccatg tccgatatgc tctacataat gacaatcaac ttggtgttca 1440
 ttatatattac aatgttagga atttcaatag ctacgaacac ttcaatagaa gtgcctttgt 1500
 gggatcacct taatgtgttg ttgatgtaag gagaagaatc ttaatttact cttgctaaat 1560
 ttgaactaca caaaaccact gcactgagga ttgtccta ataaactctgc tcatacacgt 1620
 tagcatctgt tcagatactg agctaattcc taggattaaa ggatttgtaa aagatatgcc 1680
 caatcattca ttttagttat ttatttctta gttatccact tgaagattta catacatttg 1740
 aaataaattt cttagaggta aagtgaatc cagttattta aatacatttt agttatttat 1800
 tttctctttt ttcctaattt ttccttgat ttgaagtctg aaaagataac tttgccctta 1860
 tacatatttt atcttctacg tacgcactct aacaacgtct ctttgtcccc tgatcgtgca 1920
 gcaattagtg ctatgaatcg cgtttaagcg ctgcaaaatc atggctgggg cttcgtcctc 1980
 gagtcgtcct gctgctcgat gtcacctcga gtcccgacc gacctcagtg cttgttcttg 2040
 ttggagccac ctctctcgga cgatcgccaa agacggataa ggccgaagcc gtcacttcag 2100
 accgcgtca tgcgccgtag cagactccta catagcaggg ccagggtatg tggacctttg 2160
 caagtttagg attggaacca gcgaccagaa tccacaagat tggagcaaac gacaaaaaat 2220

```

tcacaaggat tggcggtga cattgccagc gcgggatcgc atgcggcggc ggcgccggg 2280
gcgagcacgg gagcaggcga cagtcgagct ccattggaac gtagaaatac ttaagggcaa 2340
ggtctccaaa tacttgaaaa aataggaaaa agaagaaaat acatgaaatg atattgaaat 2400
caattggaag atgttatgaa tcttggtttt gcaaagcgaa cgattcagat ggcaaaacta 2460
tgaatctttt tgtttgaagt cccaaatata aaattttctc gtactcacca acattggtgc 2520
gcacctgtga ttggctcata aaaattcttg gagggacgga agaaagagtg aagggataag 2580
caagtaaaag cgc 2593

```

<210> 20

<211> 1986

<212> DNA

<213> Artificial Sequence

<220>

<223> 3' flanking sequence of DAS 59122-7.

<400> 20

```

ttcccttcta tgggtccggt tgtttacct ctaaattata taatccagct taaataagtt 60
aagagacaaa caaacacac agattattaa atagattatg taatctagat acctagatta 120
tgtaatecat aagtagaata tcaggtgctt atataatcta tgagctcgat tatataatct 180
taaaagaaaa caaacagagc ccctataaaa aggggtcaag tggacacttg gtcactcatt 240
taatccctcc ctctctctct ttatccctct ttttggtgta ttcaccaata gtggtgtgca 300
cctgtgattg gctcgtaaaa attcttggaac ggatggaaga gtgaagagat aagcaagtca 360
aagaaaagta acaacgaagc ttcacagct acaaattttg gcccaactgg ttgcaccagc 420
accaaactta cgtatacatg attatctctg ttccctcat ttcgaagaaa aaaacgggtt 480
tcaaaaccca ctgctttcag gagtaaaaaa agataataat ctgaaacatt gcttccacct 540
tggcccttat ttggttacgt tgcaattcac ccaatccac atgtggattg agatggattg 600
cagtgtagct agacaaaccc ttaggccctg tttgcatagg aatacaccag gaattattcc 660
agctaatacaa aatttatata aatgagagaa acaattcgga taggaattgt tccaggactt 720
cattctgcag taaccgaacg gccccttaat ccacccaat acacgtggat tggagtggat 780
tgaggtagag ccaaacagg cctaagtga gatcaataa atcacccgtc atattcttct 840
acctacaaaa acagcaataa acacctgaat gaagttctaa tttgcacagt gtaggtagga 900
tgaaaatagt tacctctca tggtcagtaa ctcttggcac acaacttcac atgtaatcga 960
tgtaccactt ggctcttgcc tgaaacccaa tacatcttta gcataagaat aatattatga 1020
tggcaaggca tgatcaccag cactccttta ttgtttagta agtctatcac tccccaaaac 1080
aattcaaagc aacagagatg cattgcccc aatgaattct atttcaatta gccggaaaac 1140
tctacttcat cagaagcatc caaattgcc gcatccctac tagactgacc atgaccaggc 1200
tgccgcagat gectctttt ctgtcctctc ctctttgcct tgagtttctc ttcaagatcc 1260
ctcaccacac gtctcttata catcttaaa ctaacatgtc tctcctcgc catcttccta 1320
accttctcag taatctcagc agcaatctga cggttgtaca acttcttcag ccccttcac 1380
aactttgcaa atgtgtcagg ctgtggcatc agtcctgcct ctagcatgtc taagcaatac 1440
aggcaggcct ccttgacatg tttcttcgca aacagtgcac gaatccagat agtccatgca 1500
ctcacattga gtcacagcc tttgtcaca atacatttcc aaacatcctt tgcaagctca 1560
agttttctcat ctctgaccaa cgcattgagg aggtccttca gcaccccata ttgcggtacc 1620
acaaagagcc ccctcccaac catgtcttta aaataactac atgcctcaat cagcaaaccc 1680
tgcccaacaa ggccactcac cacgatagca aatgtatcga ccacaggact gagcccagca 1740
ctttccatct cattccacaa tgtcatggct tgcttggctc cccaagcct gcaggccaac 1800
cgaatcacca cattgtatat cttgagatct ggtggacacc ggcactcccg catcctctcc 1860
atcagctcca agcactctc aagetgtctc ttcttctcgt gtgtacaaa gaaaccatgg 1920
tacacggcag cgtccaccgg caggccatcc ctcgacatag catccaagaa ctctgacccc 1980
tgggat 1986

```

<210> 21

<211> 3594

<212> DNA

<213> Artificial Sequence

<220>

<223> Sequence that represents part of the PHI17662A
insert as well as flanking sequence 5' to the
insert.

<400> 21

```
ctgagcgcac aacagcagagt cgcattggcac cggacgacat gagcagagatt tagatcggag 60
ggtgcggaca tggggcaacc tgcgcagcta acgcagggat ccacacgacc accaacgaag 120
ccaagcccgg gcacgtcccc aggcaggttg ggccctggtt ccaccagcgg atgcatgcag 180
tgaagcgggg acggagagac aagccgaggg cgcgggtggg aatggcgtcc gggaggacga 240
gtggaggaga agaattctaga ggcatcgaga ttcgagaagc cgacggagac aagattcgtg 300
tggggggaga caaacccggg ggctgagcgc cgttgatatg ggatcagacg gtgtggataa 360
aaaaagtgc gttgatagaa cgtctggcca gtgaaaaaac aaaacaactc caacaaaata 420
ctttaaaagc tcttatacce taaatgtagg ggatcaaaca cgtctctaca ctatttagca 480
gcgtcctcta aatgatcctc taaatttaga gaacgctact agattctcta tatatagttt 540
ctctaaacga tcttttatcc atttaaatac tttaaataac cggtttaaca aaactaaaat 600
atatacaata catttgagag tatgacaaat acgtatgtat aaaaataaaa aataaaaata 660
tgtattagtc tactttgaat cttcttttct tcataatata atgatgtata gctctcatgt 720
gcgttgagaa aaaagttaga gctagacgtt taatgtgtag tgacagctct cgacgaaatc 780
tcctaataga gatgaattac tggagggttc atcagaaaagt cccctgaaaa gaggcattta 840
tttagtttag tcagcaattt ctgggaacac aaatattctt ttgttatcac cactattaaa 900
aatctatggt tataacttat aataacatga aaaaataatt tagcatccca tatatataaa 960
aactgaagga agccatatat actaacataa gttaggagaa actaagaagg ttgtgcaaag 1020
cttgactgc tccaaaatac tgcaaacac cactctctc taccaacca agaaactcat 1080
gtactccctc cgttcttttt tatttgcgc attttagttt aaaaatgaac tagcagtcga 1140
caaataattc agaacagata tagtatatac taacataact taggagatac taagaaagtt 1200
gcgcagagct ttcactgttc caaattactg caaagcctct cccctctgcc agtacatcta 1260
cgagatgttt cagttaaaca aagattcaga caagtgatga gccacttctt gtcatagatt 1320
gtgtgggtcaa ccaaccatt gatgccacgg ttttgtgca tccatgcttt tgtattaaaa 1380
catcagttat gtttaccatg tccgatatgc tctacataat gacaatcaac ttggtgttca 1440
ttatatattc aatgttagga atttcaatag ctacgaacac ttcaatagaa gtgcctttgt 1500
gggatcacct taatgtgttg ttgatgtaag gagaagaatc ttaatttact cttgctaaa 1560
ttgaactaca caaaaccact gcactgagga ttgtccta ataaactactgc tcataacagt 1620
tagcatctgt tcagatactg agctaatccc taggattaaa ggatttgtaa aagatatgcc 1680
caatcattca ttttagttat ttatttctta gttatccact tgaagattta catacatttg 1740
aaataaattt cttagaggta aagtgaatat cagttattta aatacatttt agttatttat 1800
tttctctttt tctctaattt tctctgtat ttgaagtctg aaaagataac tttgccctta 1860
tacataattt atcttctacg tacgcactcg aacaacgtct ctttgtcccc tgatcgtgca 1920
gcaattagtg ctatgaatcg cgtttaagcg ctgcaaaatc atggctgggg cttcgtcctc 1980
gagtcgtcct gctgctcgat gtcacctcga gtcccgacc gacctcagt cttgttcttg 2040
ttggagccac ctctctcgga cgatcgccaa agacggataa ggccgaagcc gtcacttcag 2100
accgcgtcga tgcgccgtag cagactccta catagcaggg ccagggtatg tggacctttg 2160
caagtttagg attggaacca gcgaccagaa tccacaagat tggagcaaac gacaaaaaat 2220
tcacaaggat tggcggtgca cattgccagc gcgggatcgc atgcggcggc ggcggccggg 2280
gcgagcacgg gagcagggca cagtcgagct ccattggaac gtagaaatac ttaagggcaa 2340
ggtctccaaa tacttgaaaa aataggaaaa agaagaaaat acatgaaatg atattgaaat 2400
caattggaag atgttatgaa tcttggtttt gcaaagcgaa cgattcagat ggcaaaacta 2460
tgaatctttt tgtttgaagt cccaaatata aaattttctc gtactacca acattggtgc 2520
gcacctgtga ttggctcata aaaattcttg gagggacgga agaaagagtg aagggataag 2580
caagtaaaag cgctcaaaac ctgatagttt aaactgaagg cgggaaacga caatctgatc 2640
atgagcggag aattaaggga gtcacgttat gacccccgcc gatgacgcgg gacaagccgt 2700
tttacgtttg gaactgacag aaccgcaacg ttgaaggagc cactcagcaa gcttactagt 2760
agcgtgtttt aaacgctctt caactggaag agcggttacc cggaccgaag cttgcatgcc 2820
tgcagtgcag cgtgaccggg tcgtgcccct ctctagagat aatgagcatt gcattgtctaa 2880
gttataaaaa attaccacat attttttttg tcacacttgt ttgaagtgca gtttatctat 2940
ctttatacat atatttaaac tttactctac gaataatata atctatagta ctacaataat 3000
```

```

atcagtgttt tagagaatca tataaatgaa cagttagaca tggctctaaag gacaattgag 3060
tatttttgaca acaggactct acagttttat ctttttagtg tgcagtgtgt ctcctttttt 3120
tttgcaaata gcttcaccta tataatactt catccatttt attagtacat ccatttaggg 3180
tttaggggta atgggtttta tagactaatt ttttttagtac atctatttta ttctatttta 3240
gcctctaaat taagaaaact aaaactctat tttagttttt ttatttaata atttagatat 3300
aaaatagaat aaaataaagt gactaaaaat taaacaaata ccctttaaga aattaaaaaa 3360
actaaggaaa catttttctt gtttcgagta gataatgccg gcctgttaaa cgccgtcgac 3420
gagtctaacg gacaccaacc agcgaaccag cagcgtcgcg tcggggccaag cgaagcagac 3480
ggcacggcat ctctgtcgct gcctctggac ccctctcgag agttccgctc caccgttgga 3540
cttgctccgc tgtcggcatc cagaaattgc gtggcggagc ggcagacgtg agcc 3594

```

<210> 22

<211> 2987

<212> DNA

<213> Artificial Sequence

<220>

<223> Sequence that represents part of the PH117662A
insert as well as flanking sequence 3' to the
insert.

<400> 22

```

ctccggagag gagaccagtt gagattagc cagctacagc agctgatatg gccgcggttt 60
gtgatatcgt taaccattac attgagacgt ctacagtga ctttaggaca gagccacaaa 120
caccacaaga gtggattgat gatctagaga ggttgcaaga tagataccct tgggttggtg 180
ctgaggttga ggggtgtgtg gctgggtattg cttacgctgg gccctggaag gctaggaacg 240
cttacgattg gacagttgag agtactgttt acgtgtcaca taggcatcaa aggttgggccc 300
taggatccac attgtacaca catttgctta agtctatgga ggcgcaagggt ttaaagtctg 360
tgggtgctgt tataggcctt ccaaacgatc catctgttag gttgcatgag gctttgggat 420
acacagcccc ggggtacattg cgcgcagctg gatacaagca tgggtggatgg catgatgttg 480
gtttttggca aagggatttt gagttgccag ctccctccaag gccagtttagg ccagttaccc 540
agatctgagt cgacctgcag gcatgccgcg tgaaatcacc agtctctctc taaaaatcta 600
tctctctcta taataatgtg tgagtagtcc ccagataagg gaattagggt tcttataggg 660
tttcgctcat gtgttgagca tataagaaac ccttagtatg tatttgtatt tgtaaaatac 720
ttctatcaat aaaatttcta attcctaaaa ccaaaatcca gggcgagctc ggtacccggg 780
gatcctctag agtcgacctg caggcatgcc cgcggatata gatgggcccc ggccgaagct 840
tcggtcgggg ccacgtgggc ctcttgctct tcaggatgaa gagctatgtt taaacgtgca 900
agcgtcgaat tcgccctata gtgagtcgta ttacaatcgt acgcaattca gtacattaaa 960
aacgtccgca atgtgttatt aagttgtcta agcgtcaatt tttcccttct atgggtccgt 1020
ttgtttatcc tctaaattat ataattcagc ttaataaagt taagagacaa acaaacacaa 1080
cagattatta aatagattat gtaactaga tacctagatt atgtaatcca taagtagaat 1140
atcaggtgct tatataatct atgagctcga ttatataatc ttaaaagaaa acaaacagag 1200
ccctataaaa aaggggtcaa gtggacactt ggtcactcat ttaatccctc cctctcctct 1260
tttatccctc tttttggtgt attcaccaat agtgggtgtc acctgtgatt ggctcgtaaa 1320
aattcttgga cggatggaag agtgaagaga taagcaagtc aaagaaaagt aacaacgaag 1380
cttcacagc taaaaatttt ggcccaactg gttgcaccag caccacactt acgtatacat 1440
gattatctct gtttcctca tttcgaagaa aaaaacgggt ttcaaaaccc actgctttca 1500
ggagtaaaaa aagataataa tctgaaacat tgcttcacc ttggccctta tttggttacg 1560
ttgcaattca cccaatcca catgtggatt gagatggatt gcagtgtagc tagacaaacc 1620
cttaggcctt gtttgcatag gaatacacca ggaattatc cagctaatca aaatttatat 1680
aatgagaga aacaattcgg ataggaattg ttccaggact tcattctgca gtaaccgaac 1740
ggccccttaa tccaccccaa tacacgtgga ttggagtgga ttgaggtaca gccaaacaag 1800
gcctaagtgc agatcaaata aatcaccgt catattcttc tacctacaaa aacagcaata 1860
aacacctgaa tgaagttcta atttgcacag tgtaggtagg atgaaaatag ttacctctc 1920
atggctcagta actcttgcca cacaacttca catgtaatcg atgtaccact tggctcttgc 1980
ctgaaaccca atacatcttt agcataagaa taatattatg atggcaaggc atgatcacca 2040

```

```

gcactccttt attgtttagt aagtctatca ctccccaaaa caattcaa at gaacagagat 2100
gcattgcccc caatgaattc tatttcaatt agccggaaaa ttctacttca tcagaagcat 2160
ccaaattgcc agcatcccta ctagactgac catgaccagg ctgccgcaga tgcctctttt 2220
tctgtcctct cctctttgcc ttgagtttct cttcaagatc cctcaccoca cgtctcttat 2280
acatcttaaa gctaacatgt ctctcctccg ccatcttctt aacctttctc gtaatctcag 2340
cagcaatctg acggttgtag aactttctca gcccttctat caactttgca aatgtgtcag 2400
gctgtggcat cagtcttgcc tctagcatgt ctaagcaata caggcaggcc tccttgacat 2460
gtttcttctc aaacagtgc tgaatccaga tagtccatgc actcacattg agctcacage 2520
ctttgtctac aatacatctc caaacatcct ttgcaagctc aagttttctc tctctgacca 2580
acgcattgag gaggtccttc agcaccctcat attgcggtac cacaaagagc cccctcccaa 2640
ccatgtcttt aaaataacta catgcctcaa tcagcaaacc ctgcccaaca aggcactca 2700
ccacgatagc aaatgtatcg accacaggac tgagcccagc actttccatc tcattccaca 2760
atgtcatggc ttgcttggtc tccccagcc tgcaggccaa ccgaatcacc acattgtata 2820
tcttgagatc tgggtggcac cggcactccc gcatcctctc catcagctcc aagcactcct 2880
caagctgctc cttcttctcg tgtgctacaa agaaacctg gtacacggca gcgtccaccc 2940
gcaggccatc cctcgacata gcatccaaga actcgtaccc ctgggat 2987

```



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY DOCKET NO	TOT CLAIMS	IND CLAIMS
11/938,359	11/12/2007	1638	1030	1895D4	3	1

CONFIRMATION NO. 3820

27310
PIONEER HI-BRED INTERNATIONAL, INC.
7250 N.W. 62ND AVENUE
P.O. BOX 552
JOHNSTON, IA 50131-0552

FILING RECEIPT



OC000000028764534

Date Mailed: 03/14/2008

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 write to the Office of Initial Patent Examination's Filing Receipt Corrections. 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**

Applicant(s)

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;

Assignment For Published Patent Application

Pioneer Hi-Bred International, Inc.
Dow AgroSciences LLC
E.I. DuPont de Nemours and Company

Power of Attorney: The patent practitioners associated with Customer Number 27310

Domestic Priority data as claimed by applicant

This application is a DIV of 11/237,222 09/28/2005 PAT 7,323,556

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

Foreign Applications

If Required, Foreign Filing License Granted: 03/11/2008

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 11/938,359**

Projected Publication Date: To Be Determined - pending completion of Sequence Disclosures

Non-Publication Request: No

Early Publication Request: No

Title

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

Preliminary Class

800

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific

page 2 of 3

countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/938,359	11/12/2007	James Wayne Bing	1895D4

CONFIRMATION NO. 3820

FORMALITIES LETTER

27310
PIONEER HI-BRED INTERNATIONAL, INC.
7250 N.W. 62ND AVENUE
P.O. BOX 552
JOHNSTON, IA 50131-0552



Date Mailed: 03/14/2008

NOTICE TO COMPLY WITH REQUIREMENTS FOR PATENT APPLICATIONS CONTAINING NUCLEOTIDE SEQUENCE AND/OR AMINO ACID SEQUENCE DISCLOSURES

Filing Date Granted

Applicant is given **TWO MONTHS FROM THE DATE OF THIS NOTICE** within which to file the items indicated below to avoid abandonment. Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

- A copy of the "Sequence Listing" in computer readable form has been submitted. However, the content of the computer readable form does not comply with the requirements of 37 CFR 1.822 and/or 1.823, as indicated on the attached copy of the marked -up "Raw Sequence Listing." Applicant must provide a substitute computer readable form (CRF) copy of the "Sequence Listing" and a statement that the content of the sequence listing information recorded in computer readable form is identical to the written (on paper or compact disc) sequence listing and, where applicable, includes no new matter, as required by 37 CFR 1.821(e), 1.821(f), 1.821(g), 1.825(b), or 1.825(d). Refer to attachment or PAIR document dated 02-19-2008.

Applicant is cautioned that correction of the above items may cause the specification and drawings page count to exceed 100 pages. If the specification and drawings exceed 100 pages, applicant will need to submit the required application size fee.

To Download Patent Software, visit <http://www.uspto.gov/web/patents/software.htm>

For questions regarding compliance to these requirements, please contact:

- For Rules Interpretation, call (571) 272-0951
- For Patent Software Program Help, call Patent EBC at 1-866-217-9197 or directly at 703-305-3028 / 703-308-6845 between the hours of 6 a.m. and 12 midnight, Monday through Friday, EST.
- Send e-mail correspondence for Patent Software Program Help @ ebc@uspto.gov

Replies should be mailed to:

Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

Registered users of EFS-Web may alternatively submit their reply to this notice via EFS-Web.

<https://sportal.uspto.gov/authenticate/AuthenticateUserLocalEPF.html>

For more information about EFS-Web please call the USPTO Electronic Business Center at **1-866-217-9197** or visit our website at <http://www.uspto.gov/ebc>.

If you are not using EFS-Web to submit your reply, you must include a copy of this notice.

/wmerso/

Office of Initial Patent Examination (571) 272-4000 or 1-800-PTO-9199

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No. : 11/938,359 Confirmation No. : 3820
Applicant : James Wayne Bing, et al.
Filed : November 12, 2007
TC/A.U. : Unknown
Examiner : Unknown
Docket No. : 1895D4
Customer No. : 27310
Title : Corn Event DAS-59122-7 and Methods for Detection
Thereof

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

STATEMENT TO SUPPORT FILING OF SEQUENCE LISTING

I hereby state that the content of the substitute copy of the Sequence Listing text file electronically filed with the above-referenced application in accordance with 37 CFR 1.825(b) is the same as the amended Sequence Listing. The Sequence Listing is herein incorporated by reference into application as filed.

Respectfully submitted,

/Claire L. Moxon/
Claire L. Moxon, Reg. # 57,557

PIONEER HI-BRED INTERNATIONAL, INC.
Corporate Intellectual Property
7250 N.W. 62nd Avenue
P.O. Box 552
Johnston, Iowa 50131-0552
Phone: (515) 253-2162
Facsimile: (515) 334-6883

Electronic Acknowledgement Receipt

EFS ID:	2998894
Application Number:	11938359
International Application Number:	
Confirmation Number:	3820
Title of Invention:	Corn Event DAS-59122-7 and Methods for Detection Thereof
First Named Inventor/Applicant Name:	James Wayne Bing
Customer Number:	27310
Filer:	Claire L. Moxon/Ginny Boesen
Filer Authorized By:	Claire L. Moxon
Attorney Docket Number:	1895D4
Receipt Date:	14-MAR-2008
Filing Date:	12-NOV-2007
Time Stamp:	10:36:07
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	CRF Statement Paper and CRF are the same	1895D4_Supp_Seq_Listing_Statement.pdf	57081 9a92fc4d3f7d0fd2a94767d5f442b13c4cc2880f	no	1

Warnings:

Information:

2	Sequence Listing (Text File)	1895D4_AMENDED_SEQLI ST.TXT	58672	no	0
Warnings:					
Information:					
Total Files Size (in bytes):			115753		
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.					

SCORE Placeholder Sheet for IFW Content

Application Number: 11938359

Document Date: 03/14/2008

The presence of this form in the IFW record indicates that the following document type was received in electronic format on the date identified above. This content is stored in the SCORE database.

- **Sequence Listing**

Since this was an electronic submission, there is no physical artifact folder, no artifact folder is recorded in PALM, and no paper documents or physical media exist. The TIFF images in the IFW record were created from the original documents that are stored in SCORE.

To access the documents in the SCORE database, refer to instructions developed by SIRA.

At the time of document entry (noted above):

- Examiners may access SCORE content via the eDAN interface.
- Other USPTO employees can bookmark the current SCORE URL (<http://es/ScoreAccessWeb/>).
- External customers may access SCORE content via the Public and Private PAIR interfaces.

Form Revision Date: February 8, 2006

=====

Sequence Listing was accepted.

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

Reviewer: Anne Corrigan

Timestamp: [year=2008; month=3; day=26; hr=20; min=24; sec=38; ms=476;]

=====

Application No: 11938359

Version No: 2.0

Input Set:

Output Set:

Started: 2008-03-14 10:36:39.580
Finished: 2008-03-14 10:36:41.031
Elapsed: 0 hr(s) 0 min(s) 1 sec(s) 451 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)
W 213	Artificial or Unknown found in <213> in SEQ ID (2)
W 213	Artificial or Unknown found in <213> in SEQ ID (3)
W 213	Artificial or Unknown found in <213> in SEQ ID (4)
W 213	Artificial or Unknown found in <213> in SEQ ID (5)
W 213	Artificial or Unknown found in <213> in SEQ ID (6)
W 213	Artificial or Unknown found in <213> in SEQ ID (7)
W 213	Artificial or Unknown found in <213> in SEQ ID (8)
W 213	Artificial or Unknown found in <213> in SEQ ID (9)
W 213	Artificial or Unknown found in <213> in SEQ ID (10)
W 213	Artificial or Unknown found in <213> in SEQ ID (11)
W 213	Artificial or Unknown found in <213> in SEQ ID (12)
W 213	Artificial or Unknown found in <213> in SEQ ID (13)
W 213	Artificial or Unknown found in <213> in SEQ ID (14)
W 213	Artificial or Unknown found in <213> in SEQ ID (15)
W 213	Artificial or Unknown found in <213> in SEQ ID (16)
W 213	Artificial or Unknown found in <213> in SEQ ID (17)
W 213	Artificial or Unknown found in <213> in SEQ ID (18)
W 213	Artificial or Unknown found in <213> in SEQ ID (19)
W 213	Artificial or Unknown found in <213> in SEQ ID (20)

Input Set:

Output Set:

Started: 2008-03-14 10:36:39.580
Finished: 2008-03-14 10:36:41.031
Elapsed: 0 hr(s) 0 min(s) 1 sec(s) 451 ms
Total Warnings: 40
Total Errors: 0
No. of SeqIDs Defined: 40
Actual SeqID Count: 40

Error code

Error Description

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

SEQUENCE LISTING

<110> Bing, James Wayne
 Cressman, Jr., Robert F.
 Gupta, Manju
 Hakimi, Salim M.
 Hartnett Locke, Mary E.
 Hondred, David
 Krone, Todd L.
 Luckring, Abigail K.
 Meyer, Sandra E.
 Moellenbeck, Daniel
 Narva, Kenneth Edwin
 Olson, Paul D.
 Sanders, Craig D.
 Wang, Jimei
 Zhang, Jian
 Zhong, Gan-Yuan

<120> CORN EVENT DAS-59122-7 AND METHODS FOR
 DETECTION THEREOF

<130> 1895D4

<140> 11938359

<141> 2008-03-14

<150> 11/237,222

<151> 2005-09-28

<150> 60/614,225

<151> 2004-09-29

<160> 40

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 28

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide primer

<400> 1

gtggctcctt caacgttgcg gttctgtc

28

<210> 2

<211> 29

<212> DNA

<213> Artificial Sequence

<220>
 <223> Oligonucleotide primer

 <400> 2
 cgtgcaagcg ctcaattcgc cctatagtg 29

 <210> 3
 <211> 20
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Oligonucleotide primer

 <400> 3
 aattgagcgc ttgcacgttt 20

 <210> 4
 <211> 24
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Oligonucleotide primer

 <400> 4
 aacaacaaga ccggccacac cctc 24

 <210> 5
 <211> 25
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Oligonucleotide primer

 <400> 5
 gagtggtct ggatggtgta ggtca 25

 <210> 6
 <211> 28
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Oligonucleotide primer

 <400> 6
 tacaacctca agtggttctt cttcccga 28

 <210> 7
 <211> 25
 <212> DNA
 <213> Artificial Sequence

 <220>

<223> Oligonucleotide primer

 <400> 7
 gaggtctgga tctgcatgat gcgga 25

 <210> 8
 <211> 23
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Oligonucleotide primer

 <400> 8
 aacccttagt atgtatttgt att 23

 <210> 9
 <211> 26
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Oligonucleotide primer

 <400> 9
 ctccttcaac gttgcggttc tgtcag 26

 <210> 10
 <211> 25
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Oligonucleotide primer

 <400> 10
 ttttgcaaag cgaacgattc agatg 25

 <210> 11
 <211> 23
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Oligonucleotide primer

 <400> 11
 gcgggacaag ccggttttacg ttt 23

 <210> 12
 <211> 25
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Oligonucleotide primer

<400> 12	
gacgggtgat ttatttgatc tgcac	25
<210> 13	
<211> 25	
<212> DNA	
<213> Artificial Sequence	
<220>	
<223> Oligonucleotide primer	
<400> 13	
catctgaatc gttcgctttg caaaa	25
<210> 14	
<211> 26	
<212> DNA	
<213> Artificial Sequence	
<220>	
<223> Oligonucleotide primer	
<400> 14	
ctacgttcca atggagctcg actgtc	26
<210> 15	
<211> 25	
<212> DNA	
<213> Artificial Sequence	
<220>	
<223> Oligonucleotide primer	
<400> 15	
ggtcaagtgg acacttggtc actca	25
<210> 16	
<211> 25	
<212> DNA	
<213> Artificial Sequence	
<220>	
<223> Oligonucleotide primer	
<400> 16	
gagtgaagag ataagcaagt caaag	25
<210> 17	
<211> 25	
<212> DNA	
<213> Artificial Sequence	
<220>	
<223> Oligonucleotide primer	
<400> 17	
catgtatacg taagtttggt gctgg	25

<210> 18
 <211> 25
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Oligonucleotide primer

<400> 18
 aatccacaag attggagcaa acgac 25

<210> 19
 <211> 2593
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> 5' flanking sequence of DAS 59122-7.

<400> 19
 ctgagcgcac aacagcagagt cgcattggcac cggacgacat gagcagagatt tagatcggag 60
 ggtgacggaca tgggggcaacc tgcgcagcta acgcagggat ccacacgacc accaacgaag 120
 ccaagcccgg gcacgtcccc aggcaggttg ggccctgggt ccaccagcgg atgcatgcag 180
 tgaagcgggg acggagagac aagccgaggg cgcgggtggg aatggcgtcc gggaggacga 240
 gtggaggaga agaattctaga ggcattcgaga ttcgagaagc cgacggagac aagattcgtg 300
 tgggggggaga caaaccgcgg ggcagcgc cgttgatatg ggatcagacg gtgtggataa 360
 aaaaagtgc gttgatagaa cgtctggcca gtgaaaaaac aaaacaactc caacaaaata 420
 ctttaaaagc tcttatcccc taaatgtagg ggcataaaca cgtctctaca ctatttagca 480
 gcgtcctcta aatgatcctc taaatttaga gaacgctact agattctcta tatatagttt 540
 ctctaacaaga tcttttatcc atttaaatatc ttaataaac cggtttaaca aaactaaaat 600
 atatacaata catttgagag tatgacaaat acgtatgtat aaaaataaaa aataaaaata 660
 tgtatttagtc tactttgaat cttcttttct tcataatata atgatgtata gctctcatgt 720
 gcgttgagaa aaaagttaga gctagacgtt taatgtgtag tgacagtctt cgacgaaatc 780
 tcctaataga gatgaattac tggaggttcc atcagaaaagt cccctgaaaa gaggcattta 840
 tttagtttag tcagcaattt ctgggaacac aaatattctt ttgttatcac cactatttaa 900
 aatctatggt tataacttat aataacatga aaaaataatt tagcatccca tatatataaa 960
 aactgaagga agccatatat actaacataa gttaggagaa actaagaagg ttgtgcaaag 1020
 cttgcactgc tccaaaatac tgcaaacac cactctctc taccaaccaaa agaaactcat 1080
 gtactccctc cgttcttttt tatttgcgc attttagttt aaaaatgaac tagcagtcga 1140
 caaatattcg agaacagata tagtatatac taacataact taggagatac taagaaagtt 1200
 gcgcagagct ttcactgttc caaattactg caaagcctct cccctctgcc agtacatcta 1260
 cgagatgttt cagttaaaca aagattcaga caagtgtatg gccacttctt gtcataagatt 1320
 gtgtgggtcaa ccaaccatt gatgccacgg tttttgtgca tccatgcttt tgtattaaaa 1380
 catcagttat gtttaccatg tccgatatgc tctacataat gacaatcaac ttggtgttca 1440
 ttatatattac aatgttagga atttcaatag ctacgaacac ttcaatagaa gtgcctttgt 1500
 gggatcacct taatgtgttg ttgatgtaag gagaagaatc ttaatttact cttgctaaat 1560
 ttgaactaca caaaaccact gcactgagga ttgtcctaataa aaattactgc tcatacacgt 1620
 tagcatctgt tcagatactg agctaattccc taggattaaa ggatttgtaa aagatatgcc 1680
 caatcattca ttttagttat ttatttctta gttatccact tgaagattta catacatttg 1740
 aaataaattt cttagaggta aagtgaatc cagttattta aatacatttt agttatttat 1800
 tttctctttt ttcctaattt ttccttgat ttgaagtctg aaaagataac ttgcccctta 1860
 tacatatttt atcttctacg tacgcatctg aacaacgtct ctttgcctcc tgatcgtgca 1920
 gcaatttagtg ctatgaatcg cgtttaagcg ctgcaaaatc atggctgggg cttcgtcctc 1980
 gagtcgtcct gctgctcgat gtcacctcga gtcccgacc gacctcagtg cttgttcttg 2040
 ttggagccac ctctctcgga cgatcgccaa agacggataa ggccgaagcc gtcacttcag 2100
 accgcgtca tgcgccgtag cagactccta catagcaggg ccagggtatg tggaccttg 2160

```

caagtttagg attggaacca gcgaccagaa tccacaagat tggagcaaac gacccaaaat 2220
tcacaaggat tggcggtcga cattgccagc gcgggatcgc atgcggcggc ggcgccggg 2280
gcgagcacgg gagcaggcga cagtcgagct ccattggaac gtagaaatac ttaagggcaa 2340
ggtctccaaa tacttgaaaa aataggaaaa agaagaaaat acatgaaatg atattgaaat 2400
caattggaag atgttatgaa tcttggtttt gcaaagcgaa cgattcagat ggcaaaacta 2460
tgaatctttt tgtttgaagt cccaaatata aaattttctc gtactcacca acattggtgc 2520
gcacctgtga ttggctcata aaaattcttg gagggacgga agaaagagtg aagggataag 2580
caagtaaaag cgc 2593

```

<210> 20

<211> 1986

<212> DNA

<213> Artificial Sequence

<220>

<223> 3' flanking sequence of DAS 59122-7.

<400> 20

```

ttcccttcta tgggtccggt tgtttatcct ctaaattata taatccagct taaataagtt 60
aagagacaaa caaacaacac agattattaa atagattatg taatctagat acctagatta 120
tgtaatccat aagtagaata tcaggtgctt atataatcta tgagctcgat tatataatct 180
taaaagaaaa caaacagagc ccctataaaa aggggtcaag tggacacttg gtcactcatt 240
taatccctcc ctctcctctt ttatccctct ttttggtgta ttcaccaata gtggtgtgca 300
cctgtgattg gctcgtaaaa attcttgac ggatggaaga gtgaagagat aagcaagtca 360
aagaaaagta acaacgaagc ttcacagct acaaattttg gcccaactgg ttgcaccagc 420
accaaactta cgtatacatg attatctctg ttccctcat ttcgaagaaa aaaacgggtt 480
tcaaaaccca ctgcttcag gagtaaaaaa agataataat ctgaaacatt gcttccacct 540
tggcccttat ttggttacgt tgcaattcac cccaatccac atgtggattg agatggattg 600
cagtgtagct agacaaaccc ttaggccctg tttgcatagg aatacaccag gaattattcc 660
agctaatacaa aatttatata aatgagagaa acaattcgga taggaattgt tccaggactt 720
cattctgcag taaccgaacg gccccttaat ccacccaat acacgtggat tggagtggat 780
tgaggtagag ccaaacaagg cctaagtga gatcaaataa atcacccgtc atattcttct 840
acctacaaaa acagcaataa acacctgaat gaagttctaa tttgcacagt gtaggtagga 900
tgaaaatagt tacctcctca tggtcagtaa ctcttggcac acaacttcac atgtaatcga 960
tgtaccactt ggctcttgcc tgaaacccaa tacatcttta gcataagaat aatattatga 1020
tggcaaggca tgatcaccag cactccttta ttgtttagta agtctatcac tccccaaaac 1080
aattcaaagt aacagagatg cattgcccc aatgaattct atttcaatta gccggaaaat 1140
tctacttcat cagaagcatc caaattgcc aatccctac tagactgacc atgaccaggc 1200
tgccgcagat gctcctttt ctgtcctctc ctctttgcct tgagtttctc ttcaagatcc 1260
ctcaccacac gtctcttata catcttaaag ctaacatgtc tctcctccgc catcttccta 1320
accttctcag taatctcagc agcaatctga cggttgtaca acttcttcag ccccttcac 1380
aactttgcaa atgtgtcagc ctgtggcatc agtcctgcct ctagcatgtc taagcaatac 1440
aggcaggcct ccttgacatg tttcttcgca aacagtgcac gaatccagat agtccatgca 1500
ctcacattga gctcacagcc tttgtcaca atacatttcc aaacatcctt tgcaagctca 1560
agttttctcat ctctgaccaa cgcattgagg aggtccttca gcaccccata ttgcggtacc 1620
acaaagagcc cctcccaac catgtcttta aaataactac atgcctcaat cagcaaaccc 1680
tgcccaacaa ggccactcac cagcatagca aatgtatcga ccacaggact gagcccagca 1740
ctttccatct cattccacaa tgcatggtt tgccttggtc cccaagcct gcaggccaac 1800
cgaatcacca cattgtatat cttgagatct ggtggacacc ggcactcccg catcctctcc 1860
atcagctcca agcactctc aagctgctcc ttcttctcgt gtgctacaaa gaaaccatgg 1920
tacacggcag cgtccacccg caggccatcc ctgcacatag catccaagaa ctcgtaaccc 1980
tgggat 1986

```

<210> 21

<211> 3594

<212> DNA

<213> Artificial Sequence

<220>

<223> Sequence that represents part of the PHI17662A
insert as well as flanking sequence 5' to the
insert.

<400> 21

```
ctgagcgcac aacagcagagt cgcattggcac cggacgacat gagcagagatt tagatcggag 60
ggtgacggaca tggggcaacc tgcgcagcta acgcagggat ccacacgacc accaacgaag 120
ccaagcccgg gcacgtcccc aggcaggttg ggccctgggt ccaccagcgg atgcatgcag 180
tgaagcgggg acggagagac aagccgaggg cgcgggtggg aatggcgtcc gggaggacga 240
gtggaggaga agaattcaga ggcattcaga ttcgagaagc cgacggagac aagattcgtg 300
tggggggaga caaacccggg ggcctgagcg cgttgatatg ggatcagacg gtgtggataa 360
aaaaagtgc gttgatagaa cgtctggcca gtgaaaaaac aaaacaactc caacaaaata 420
ctttaaaagc tcttatcccc taaatgtagg ggcataaaca cgtctctaca ctatttagca 480
gcgtcctcta aatgatcctc taaatttaga gaacgctact agattctcta tatatagttt 540
ctctaaacga tcttttatcc atttaaatac tttaaataac cggtttaaca aaactaaaat 600
atatacaata catttgagag tatgacaaat acgtatgtat aaaaataaaa aataaaaata 660
tgtattagtc tactttgaat cttcttttct tcataatata atgatgtata gctctcatgt 720
gcgttgagaa aaaagttaga gctagacgtt taatgtgtag tgacagtcct cgacgaaatc 780
tcctaataga gatgaattac tggagggttc atcagaaagt cccctgaaaa gaggcattta 840
tttagtttag tcagcaattt ctgggaacac aaatattctt ttgttatcac cactattaaa 900
aatctatggt tataacttat aataacatga aaaaataatt tagcatccca tatatataaa 960
aactgaagga agccatatat actaacataa gttaggagaa actaagaagg ttgtgcaaag 1020
cttgcaactgc tccaaaatac tgcaaacac cactctcttc taccaacca agaaactcat 1080
gtactccctc cgttcttttt tatttgtgc attttagttt aaaaatgaac tagcagtcga 1140
caaatattcg agaacagata tagtatatac taacataact taggagatac taagaaagtt 1200
gcgcagagct ttcactgttc caaattactg caaagcctct cccctctgcc agtacatcta 1260
cgagatgttt cagttaaaca aagattcaga caagtgatga gccacttctt gtcatagatt 1320
gtgtgggtcaa ccaaccatt gatgccacgg tttttgtgca tccatgcttt tgtattaaaa 1380
catcagttat gtttaccatg tccgatatgc tctacataat gacaatcaac ttggtgttca 1440
ttatatattc aatgttagga atttcaatag ctacgaacac ttcaatagaa gtgcctttgt 1500
gggatcacct taatgtgttg ttgatgtaag gagaagaatc ttaatttact cttgctaaa 1560
ttgaactaca caaaaccact gcactgagga ttgtcctaataa aattactgc tcataacagt 1620
tagcatctgt tcagatactg agctaattcc taggattaaa ggatttgtaa aagatatgcc 1680
caatcattca ttttagttat ttatttctta gttatccact tgaagattta catacatttg 1740
aaataaattt cttagaggta aagtgaatat cagttattta aatacatttt agttatttat 1800
tttcttcttt ttcctaattt ttccttgtat ttgaagtctg aaaagataac tttgccctta 1860
tacatatttt atcttctacg tacgcattcg aacaacgtct ctttgtcccc tgatcgtgca 1920
gcaattagtg ctatgaatcg cgtttaagcg ctgcaaaatc atggctgggg cttcgtcctc 1980
gagtcgtcct gctgctcgat gtcacctga gtcccgacc gacctcagt cttgttcttg 2040
ttggagccac ctctctcgga gcatcgccaa agacggataa ggccgaagcc gtcacttcag 2100
accgcgtca tgcgccgtag cagactccta catagcaggg ccagggtatg tggacctttg 2160
caagtttagg attggaacca gcgaccagaa tccacaagat tggagcaaac gacaaaaaat 2220
tcacaaggat tggcggtgca cattgccagc gcgggatcgc atgcggcggc ggcggccggg 2280
gcgagcacgg gagcagcgca cagtcgagct ccattggaac gtagaaatac ttaagggcaa 2340
ggtctccaaa tacttgaaaa aataggaaaa agaagaaaat acatgaaatg atattgaaat 2400
caattggaag atgttatgaa tcttggtttt gcaaagcgaa cgattcagat ggcaaaacta 2460
tgaatctttt tgtttgaagt cccaaatata aaattttctc gtactacca acattggtgc 2520
gcacctgtga ttggctcata aaaattcttg gagggacgga agaaagagtg aagggataag 2580
caagtaaaag cgctcaaaac ctgatagttt aaactgaagg cgggaaacga caatctgatc 2640
atgagcggag aattaaggga gtcacgttat gacccccgcc gatgacggg gacaagccgt 2700
tttacgtttg gaactgacag aaccgcaacg ttgaaggagc cactcagcaa gcttactagt 2760
agcgtgtttt aaacgctctt caactggaag agcggttacc cggaccgaag cttgcatgcc 2820
tgcagtgcag cgtgacccgg tcgtgccctt ctctagagat aatgagcatt gcatgtctaa 2880
gttataaaaa attaccacat attttttttg tcacacttgt ttgaagtgca gtttatctat 2940
```

```

ctttatacat atattttaaac tttactctac gaataatata atctatagta ctacaataat 3000
atcagtgttt tagagaatca tataaatgaa cagttagaca tgggtctaaag gacaattgag 3060
tatttttgaca acaggactct acagttttat ctttttagtg tgcatgtgtt ctcccttttt 3120
tttgcaaata gcttcaccta tataaacttt catccatttt attagtacat ccatttaggg 3180
tttaggggta atgggttttta tagactaatt ttttttagtac atctatttta ttctatttta 3240
gcctctaaat taagaaaact aaaactctat tttagttttt ttatttaata atttagatat 3300
aaaatagaat aaaataaagt gactaaaaat taaacaaata ccctttaaga aattaaaaaa 3360
actaaggaaa catttttctt gtttcgagta gataatgccg gcctgttaaa cgccgtcgac 3420
gagtcatacg gacaccaacc agcgaaccag cagcgtcgcg tcgggccaaag cgaagcagac 3480
ggcacggcat ctctgtcgct gcctctggac ccctctcgag agttccgctc caccgttgga 3540
cttgctccgc tgtcggcatc cagaaattgc gtggcggagc ggcagacgtg agcc 3594

```

<210> 22

<211> 2987

<212> DNA

<213> Artificial Sequence

<220>

<223> Sequence that represents part of the PHI17662A
insert as well as flanking sequence 3' to the
insert.

<400> 22

```

ctccggagag gagaccagtt gagattaggc cagctacagc agctgatatg gccgcggttt 60
gtgatatcgt taaccattac attgagacgt ctacagtga ctttaggaca gagccacaaa 120
caccacaaga gtggattgat gatctagaga ggttgcaaga tagataccct tgggttggttg 180
ctgaggttga ggggtgtgtg gctgggtattg cttacgctgg gccctggaag gctaggaacg 240
cttacgattg gacagttgag agtactgttt acgtgtcaca taggcatcaa aggttgggcc 300
taggatccac attgtacaca catttgctta agtctatgga ggcgcaaggt ttaagtctg 360
tgggtgctgt tataggcctt ccaaacgatc catctggttag gttgcatgag gctttgggat 420
acacagcccc gggtagattg cgcgacgtg gatacaagca tgggtggatgg catgatgttg 480
gtttttggca aagggatttt gaggttgccag ctccctccaag gccagttagg ccagttaccc 540
agatctgagt cgacctgcag gcatgccgc tgaaatcacc agtctctctc tacaatcta 600
tctctctcta taataatgtg tgagtagttc ccagataagg gaattagggt tcttataggg 660
tttcgctcat gtgttgagca tataagaaac ccttagtatg tatttgtatt tgtaaaatac 720
ttctatcaat aaaatttcta attcctaaaa ccaaaatcca gggcgagctc ggtacccggg 780
gatcctctag agtcgacctg caggcatgcc cgcggatatc gatgggcccc ggccgaagct 840
tcggtcgggg ccacgtggc ctcttgctct tcaggatgaa gagctatgtt taaacgtgca 900
agcgtcfaat tcgccctata gtgagtcgta ttacaatcgt acgcaattca gtacattaaa 960
aacgtccgca atgtgttatt aagttgtcta agcgtcaatt tttcccttct atggtcccgt 1020
ttgtttatcc tctaaattat ataaccagc ttaaataagt taagagacaa acaaacacaa 1080
cagattatta aatagattat gtaatctaga tacctagatt atgtaatcca taagtagaat 1140
atcaggtgct tatataatct atgagctcga ttatataatc ttaaaagaaa acaaacagag 1200
cccctataaa aaggggtcaa gtggacactt ggtcactcat ttaatccctc cctctcctct 1260
tttatccctc tttttggtgt attcaccaat agtgggtgtc acctgtgatt ggctcgtaaa 1320
aattcttgga cggatggaag agtgaagaga taagcaagtc aaagaaaagt aacaacgaag 1380
cttcacgacg tacaaatttt ggcccaactg gttgcaccag caccaaactt acgtatacat 1440
gattatctct gtttcctcct tttcgaagaa aaaaacgggt ttcaaaaccc actgctttca 1500
ggagtaaaaa aagataataa tctgaaacat tgcttcacc ttggccctta tttggttacg 1560
ttgcaattca cccaatcca catgtggatt gagatggatt gcagtgtagc tagacaaacc 1620
cttaggcctt gtttgcatag gaatacacca ggaattatc cagctaataa aaatttatat 1680
aatgagaga aacaattcgg ataggaattg ttccaggact tcattctgca gtaaccgaac 1740
ggccccctaa tccaccccaa tacacgtgga ttggagtgga ttgaggtaca gccaaacaag 1800
gcctaagtgc agatcaaata aatcaccgt catattcttc tacctacaaa aacagcaata 1860
aacacctgaa tgaagtctta atttgcacag tgtaggtagg atgaaaatag ttacctctc 1920
atggtcagta actcttgcca cacaacttca catgtaatcg atgtaccact tggetcttgc 1980

```

```

ctgaaaccca atacatcttt agcataagaa taatattatg atggcaaggc atgatcacca 2040
gcactccttt attgttttagt aagtctatca ctccccaaaa caattcaaatt gaacagagat 2100
gcattgcccc caatgaattc tatttcaatt agccggaaaa ttctacttca tcagaagcat 2160
ccaaattgcc agcatcccta ctagactgac catgaccagg ctgccgcaga tgcctctttt 2220
tctgtcctct cctctttgcc ttgagtttct cttcaagatc cctcacccca cgtctcttat 2280
acatcttaaa gctaacatgt ctctcctccg ccatcttctt aacctttctc gtaatctcag 2340
cagcaatctg acggttgtag aacttcttca gcccttctat caactttgca aatgtgtcag 2400
gctgtggcat cagtectgcc tctagcatgt ctaagcaata caggcaggcc tccttgacat 2460
gtttcttctc aaacagtgc tgaatccaga tagtccatgc actcacattg agctcacagc 2520
ctttgtctac aatacatctt caaacatcct ttgcaagctc aagttttctc tctctgacca 2580
acgcattgag gaggtccttc agcaccctat attgcggtac cacaaagagc cccctcccaa 2640
ccatgtcttt aaaataacta catgcctcaa tcagcaaacc ctgcccaaca aggcactca 2700
ccacgatagc aaatgtatcg accacaggac tgagcccagc actttccatc tcattccaca 2760
atgtcatggc ttgcttggtc tccccagcc tgcaggccaa ccgaatcacc acattgtata 2820
tcttgagatc tgggtggacac cggcactccc gcatectctc catcagctcc aagcactcct 2880
caagctgctc cttcttctcg tgtgctacaa agaaaccatg gtacacggca gcgtccaccc 2940
gcaggccatc cctcgacata gcatccaaga actcgtaccc ctgggat 2987

```



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(c) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/938,359	11/12/2007	James Wayne Bing	1895D4

CONFIRMATION NO. 3820

27310
PIONEER HI-BRED INTERNATIONAL, INC.
7250 N.W. 62ND AVENUE
P.O. BOX 552
JOHNSTON, IA50131-0552

Date Mailed. 04/10/2008

NOTICE OF NEW OR REVISED PROJECTED PUBLICATION DATE

The above-identified application has a new or revised projected publication date. The current projected publication date for this application is 07/17/2008. If this is a new projected publication date (there was no previous projected publication date), the application has been cleared by Licensing & Review or a secrecy order has been rescinded and the application is now in the publication queue.

If this is a revised projected publication date (one that is different from a previously communicated projected publication date), the publication date has been revised due to processing delays in the USPTO or the abandonment and subsequent revival of an application. The application is anticipated to be published on a date that is more than six weeks different from the originally-projected publication date.

More detailed publication information is available through the private side of Patent Application Information Retrieval (PAIR) System. The direct link to access PAIR is currently <http://pair.uspto.gov>. Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Questions relating to this Notice should be directed to the Office of Patent Publication at 1-888-786-0101.

PART 1 - ATTORNEY/APPLICANT COPY



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY DOCKET NO	TOT CLAIMS	IND CLAIMS
11/938,359	11/12/2007	1638	1030	1895D4	3	1

CONFIRMATION NO. 3820

UPDATED FILING RECEIPT



OC000000029257894

27310
PIONEER HI-BRED INTERNATIONAL, INC.
7250 N.W. 62ND AVENUE
P.O. BOX 552
JOHNSTON, IA 50131-0552

Date Mailed: 04/14/2008

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 write to the Office of Initial Patent Examination's Filing Receipt Corrections. 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**

Applicant(s)

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;

Assignment For Published Patent Application

Pioneer Hi-Bred International, Inc.
Dow AgroSciences LLC
E.I. DuPont de Nemours and Company

Power of Attorney: The patent practitioners associated with Customer Number 27310

Domestic Priority data as claimed by applicant

This application is a DIV of 11/237,222 09/28/2005 PAT 7,323,556

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

Foreign Applications

If Required, Foreign Filing License Granted: 03/11/2008

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 11/938,359**

Projected Publication Date: 07/24/2008

Non-Publication Request: No

Early Publication Request: No
Title

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

Preliminary Class

800

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific

page 2 of 3

countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/938,359	11/12/2007	James Wayne Bing	1895D4

CONFIRMATION NO. 3820

PUBLICATION NOTICE

27310
PIONEER HI-BRED INTERNATIONAL, INC.
7250 N.W. 62ND AVENUE
P.O. BOX 552
JOHNSTON, IA 50131-0552



Date Mailed: 07/24/2008

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

Publication No.US-2008-0178357-A1

Publication Date:07/24/2008

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.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently <http://www.uspto.gov/patft/>.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently <http://pair.uspto.gov/>. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

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.

POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(b).

I hereby appoint:



Practitioners associated with the Customer Number:

27142

OR



Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number	Name	Registration Number

as attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(b).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(b) to:



The address associated with Customer Number:

27142

OR



Firm or Individual Name

Address

City

State

Zip

Country

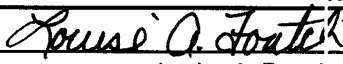
Telephone

Email

Assignee Name and Address:

Pioneer Hi-Bred International, Inc.
800 Capital Square, 400 Locust Street
Des Moines, IA 50309**A copy of this form, together with a statement under 37 CFR 3.73(b) (Form PTO/SB/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(b) may be completed by one of the practitioners appointed in this form if the appointed practitioner is authorized to act on behalf of the assignee, and must identify the application in which this Power of Attorney is to be filed.****SIGNATURE of Assignee of Record**

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Signature		Date	November 6, 2008
Name	Louise A. Foutch	Telephone	515-248-4835
Title	Assistant Secretary		

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. 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 1.11 and 1.14. This collection is estimated to take 3 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.

STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: Bing, James Wayne., et al.

Application No./Patent No.: 11/938,359

Filed/Issue Date: 11/12/2007

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

Pioneer Hi-Bred International, Inc., a Corporation

(Name of Assignee)

(Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that it is:

1. ☒ the assignee of the entire right, title, and interest; or
2. ☐ an assignee of less than the entire right, title, and interest

The extent (by percentage) of its ownership interest is _____ %

in the patent application/patent identified above by virtue of either:

- A. ☒ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel 016658, Frame 0251, or for which a copy thereof is attached.

OR

- B. ☐ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as shown below:

1. From: _____ To: _____
The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.

2. From: _____ To: _____
The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.

3. From: _____ To: _____
The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet.

☐ Copies of assignments or other documents in the chain of title are attached.

[NOTE: A separate copy (i.e., a true copy of the original document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, if the assignment is to be recorded in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

Louise A. Foutch
Signature

11/6/2008

Date

Louise A. Foutch

Printed or Typed Name

515/248-4835

Telephone Number

Assistant Secretary

Title

This collection of information is required by 37 CFR 3.73(b). 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 1.11 and 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.

POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(b). For Application/Patent No.: 11/938,359

I hereby appoint:



Practitioners associated with the Customer Number:

27142

OR



Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number	Name	Registration Number

as attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(b).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(b) to:



The address associated with Customer Number:

27142

OR

☐ Firm or Individual Name			
Address			
City	State	Zip	
Country			
Telephone	Email		

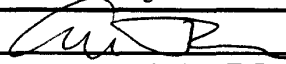
Assignee Name and Address:

Dow AgroSciences LLC
9330 Zionsville Road
Indianapolis, IN 46268

A copy of this form, together with a statement under 37 CFR 3.73(b) (Form PTO/SB/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(b) may be completed by one of the practitioners appointed in this form if the appointed practitioner is authorized to act on behalf of the assignee, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Signature		Date	December 17, 2008
Name	Andrea T. Borucki	Telephone	317-337-4846
Title	General Patent Counsel		

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. 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 5 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 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.

STATEMENT UNDER 37 CFR 3.73(b)Applicant/Patent Owner: BING, James Wagner, et al.Application No./Patent No.: 11/938,359Filed/Issue Date: November 12, 2007Entitled: CORN EVENT DAS-59122-7 AND METHODS FOR DETECTION THEREOFDOW AGROSCIENCES LLC.a Limited Liability Company

(Name of Assignee)

(Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that it is:

1. ☒ the assignee of the entire right, title, and interest; or
2. ☐ an assignee of less than the entire right, title and interest.
The extent (by percentage) of its ownership interest is ____%
in the patent application/patent identified above by virtue of either:

A. [X] An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel 016876, Frame 0849, or for which a copy thereof is attached.

OR

B. [] A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as shown below:

1. From: _____ To: _____
The document was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.
2. From: _____ To: _____
The document was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.
3. From: _____ To: _____
The document was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.

[] Additional documents in the chain of title are listed on a supplemental sheet.

[] Copies of assignments or other documents in the chain of title are attached.

[NOTE: A separate copy (i.e., the original assignment document or a true copy of the original document) must be submitted to Assignment Division in accordance with 37 CFR Part 3, if the assignment is to be recorded in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

December 17, 2008

Date

ANDREA T. BORUCKI

Typed or printed name

317-337-4846

Telephone number



Signature

GENERAL PATENT COUNSEL

Title

This collection of information is required by 37 CFR 3.73(b). 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.

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

Electronic Acknowledgement Receipt

EFS ID:	4570144
Application Number:	11938359
International Application Number:	
Confirmation Number:	3820
Title of Invention:	Corn Event DAS-59122-7 and Methods for Detection Thereof
First Named Inventor/Applicant Name:	James Wayne Bing
Customer Number:	27310
Filer:	Heidi S. Nebel/Patricia E. Wilson
Filer Authorized By:	Heidi S. Nebel
Attorney Docket Number:	1895D4
Receipt Date:	07-JAN-2009
Filing Date:	12-NOV-2007
Time Stamp:	14:55:08
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		1895D4_BING_P08987US05_D OW-PHI_POA.pdf	236737 4de9a4607005ca34903b1af134d363cd953e64a	yes	4

	Multipart Description/PDF files in .zip description		
	Document Description	Start	End
	Change of Address	1	1
	Assignee showing of ownership per 37 CFR 3.73(b).	2	2
	Change of Address	3	3
	Assignee showing of ownership per 37 CFR 3.73(b).	4	4
Warnings:			
Information:			
Total Files Size (in bytes):		236737	
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.			



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/938,359	11/12/2007	James Wayne Bing	1895D4

CONFIRMATION NO. 3820

POA ACCEPTANCE LETTER

27142
MCKEE, VOORHEES & SEASE, P.L.C.
ATTN: PIONEER HI-BRED
801 GRAND AVENUE, SUITE 3200
DES MOINES, IA 50309-2721



Date Mailed: 01/14/2009

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 01/07/2009.

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.

/sleutchit/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/938,359	11/12/2007	James Wayne Bing	1895D4

27310
PIONEER HI-BRED INTERNATIONAL, INC.
7250 N.W. 62ND AVENUE
P.O. BOX 552
JOHNSTON, IA 50131-0552

CONFIRMATION NO. 3820
POWER OF ATTORNEY NOTICE



Date Mailed: 01/14/2009

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 01/07/2009.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

/sleutchit/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/938,359	11/12/2007	James Wayne Bing	1895D4	3820

27142	7590	02/09/2010
MCKEE, VOORHEES & SEASE, P.L.C.		
ATTN: PIONEER HI-BRED		
801 GRAND AVENUE, SUITE 3200		
DES MOINES, IA 50309-2721		

EXAMINER	
KUBELIK, ANNE R	

ART UNIT	PAPER NUMBER
1638	

NOTIFICATION DATE	DELIVERY MODE
02/09/2010	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):

patatty@ipmvs.com

Office Action Summary	Application No. 11/938,359		Applicant(s) BING ET AL.	
	Examiner Anne R. 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) ☐ 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

4) ☒ Claim(s) 1-3 is/are pending in the application.
 4a) Of the above claim(s) ____ is/are withdrawn from consideration.

5) ☐ Claim(s) ____ is/are allowed.

6) ☒ Claim(s) 1-3 is/are rejected.

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

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

Application Papers

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

10) ☒ The drawing(s) filed on 12 November 2007 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).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

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) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

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

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

5) ☐ Notice of Informal Patent Application

6) ☐ Other: ____.

DETAILED ACTION

1. Claims 1-3 are pending.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a), which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Narva et al (2002, US Patent 6,372,480) in view of Boets et al (US Patent Application Publication 2002/0199215), taken with the evidence of Crickmore et al (2009, http://www.lifesci.sussex.ac.uk/Home/Neil_Crickmore/Bt/).

The claims are drawn to a DNA construct comprising three expression cassettes, the first comprising a maize ubiquitin promoter, a maize ubiquitin 5' untranslated exon, a maize ubiquitin first intron, a DNA encoding Cry34Ab1, and a PinII transcriptional terminator; the second comprising a wheat peroxidase promoter, a DNA encoding Cry35Ab1, and a PinII transcriptional terminator; and the third comprising a CaMV 35S promoter, a DNA encoding PAT, and a CaMV 35S transcriptional terminator, and plants, including maize, transformed with it.

Narva et al teach a DNA construct comprising three expression cassettes, the first comprising a maize ubiquitin promoter, a maize ubiquitin 5' untranslated exon, a maize ubiquitin first intron, a DNA encoding the PS149B1 14 kDa toxin, and a PinII transcriptional terminator; the second comprising a maize ubiquitin promoter, a maize ubiquitin 5' untranslated exon, a

Art Unit: 1638

maize ubiquitin first intron, a DNA encoding the PS149B1 44.3 kDa toxin, and a PinII transcriptional terminator; and the third comprising a CaMV 35S promoter, a DNA encoding PAT, and a CaMV 35S transcriptional terminator (column 32, line 40, to column 33, line 6). Narva et al also teach maize plants transformed with it (column 33, lines 7-37).

Crickmore teaches that the PS149B1 14 kDa toxin is now called Cry34Ab1 and the PS149B1 44.3 kDa toxin is now called Cry35Ab1.

Narva et al do not teach the use of the wheat peroxidase promoter in the construct.

Boets et al teach the use of the root specific wheat peroxidase promoter in expressing Bacillus endotoxins (¶77).

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to modify the DNA construct taught by Narva et al to use the wheat peroxidase promoter in the construct as described in Boets et al. One of ordinary skill in the art would have been motivated to do so because targeting the toxin to the roots would be advantageous in controlling rootworm.

Conclusion

4. No claim is allowed.

5. 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

Art Unit: 1638

(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.

February 6, 2010

/Anne R Kubelik/

Primary Examiner, Art Unit 1638

Notice of References Cited	Application/Control No. 11/938,359	Applicant(s)/Patent Under Reexamination BING ET AL.	
	Examiner Anne R. 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-6,372,480	04-2002	Narva et al.	435/252.5
*	B	US-2002/0199215	12-2002	Boets et al.	800/279
	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	Crickmore et al (2009, http://www.lifesci.sussex.ac.uk/Home/Neil_Crickmore/Bt/)
	V	Herman et al (2002, J. econ. Entomol. 95:635-639
	W	Moellenbeck et al (2001, Nature Biotechnol. 19:668-672)
	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.

<i>Search Notes</i> 	Application/Control No. 11938359	Applicant(s)/Patent Under Reexamination BING ET AL.
	Examiner Anne R Kubelik	Art Unit 1638

SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
STN	7/21/09	ark
EAST	7/21/09	ark
http://www.lifesci.sussex.ac.uk/home/Neil_Crickmore/Bt/index.html	7/21/09	ark

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

--	--

(FILE 'HOME' ENTERED AT 14:57:48 ON 21 JUL 2009)

FILE 'BIOSIS, CAPLUS, CABA, AGRICOLA' ENTERED AT 14:58:15 ON 21 JUL 2009

L1 90 S CRY34?

L2 44 DUPLICATE REMOVE L1 (46 DUPLICATES REMOVED)

EAST Search History**EAST Search History (Prior Art)**

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	23	Cry34Ab1	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/07/21 15:13
L2	3	Cry34Ab	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/07/21 15:14
L3	1	Cry35Ab	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/07/21 15:15
L4	25	Cry35Ab1	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/07/21 15:15

EAST Search History (Interference)

< This search history is empty >

7/ 21/ 2009 3:16:23 PM

**C:\ Documents and Settings\ akubelik\ My Documents\ EAST\ Workspaces
 \ 11938359.wsp**

EAST Search History**EAST Search History (Prior Art)**

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	55	moellenbeck.in.	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/07/21 15:27
L2	443	binary same toxin	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/07/21 15:29
L3	366	(binary same toxin) and bacillus	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/07/21 15:30
L4	170	(binary same toxin) same bacillus	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/07/21 15:30
L5	103040	ellis.in. bacillus	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/07/21 15:36
L6	152	ellis.in. and bacillus	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2009/07/21 15:36

EAST Search History (Interference)

< This search history is empty >

7/ 21/ 2009 3:44:14 PM**C:\ Documents and Settings\ akubelik\ My Documents\ EAST\ Workspaces\ 11938359.wsp**

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

Substitute for form 1449A/PTO		Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary)		Application Number	
		Filing Date	11/12/2007
		First Named Inventor	James Wayne Bing
		Art Unit	
		Examiner Name	
Sheet	1	of	1
		Attorney Docket Number	1895D4

U.S. PATENT DOCUMENTS					
Examiner Initials *	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number - Kind Code ² (if known)			
	A1	US-6,395,485	05-28-2002	Marc DeBeuckeleer	Entire document

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No. ¹	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T ⁶
		Country Code ³ - Number ⁴ - Kind Code ⁵ (if known)				
	A2	WO 2004/011601 A2	02-05-2004	Monsanto Technology, LLC	Entire document	
	A3	EP 1 167 531 A1	02-01-2002	Monsanto Technology, LLC	Entire document	
	A4	WO 84/02913	08-02-1984	Monsanto Company	Entire document	
	A5	WO 01/14417	03-01-2001	Mycogen Corporation	Entire document	
	A6	WO 03/052073	06-26-2003	Syngenta Participations AG	Entire document	
	A7	WO 2002/15701	02-28-2002	Syngenta Participations Ag	Entire document	

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials *	Cite No. ¹	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.	T ²
	A8	KARIN RICKER, Biotechnology Consultation Note to the File BNF No. 000081, U.S. Food and Drug Administration, (2004), Pages 1-6, XP002384225	
	A9	HUNST AND ROOD, Application for the Determination of Nonregulated Status for <i>B.t.</i> Cry34/35Ab1 Insect-Resistant, Glufosinate-Tolerant Corn: Corn Line 59122, U.S. Department of Agriculture, Animal and Plant Health Inspection Service, (2004), Pages 1-237, XP 002384226	
	A10	WHITELAW, ET AL., PUFTW67TB ZM_0.6_1.0_KB Zea mays genomic clone ZMMBTa0732K13, genomic survey sequence, (2003), EMBL Accession No. CG069192	
	A11	ELLIS, ET AL., Novel <i>Bacillus thuringiensis</i> Binary Insecticidal Crystal Proteins Active on Western corn Rootworm, <i>Diabrotica virgifera virgifera</i> LeConte, App and Envir Microbiology, 68(3): 1137-1145, XP002985898	

Examiner Signature	/Anne Kubelik/	Date Considered	07/21/2009
-----------------------	----------------	--------------------	------------

*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. ¹ Applicant's unique citation designation number (optional). ² See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. ³ Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. ⁶ Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. 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 2 hours 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.

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

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re:	James Wayne Bing et al.	Group Art Unit: 1638
Appl. No.:	11/938,359	Examiner Name: Anne R. Kubelik
Filed:	November 12, 2007	Confirmation No.: 3820
For:	CORN EVENT DAS-59122-7 AND METHODS FOR DETECTION THEREOF	

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 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

ALSTON & BIRD LLP
Bank of America Plaza
101 South Tryon Street, Suite 4000
Charlotte, NC 28280-4000
Tel Charlotte Office (704) 444-1000
Fax Charlotte Office (704) 444-1111
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:

E.I. DuPont deNemours and Company

By: Barbara Massie

Print Name: Barbara Massie

Title: Assistant Secretary - Patent Board

Date: February 3, 2010

ALSTON & BIRD LLP
Bank of America Plaza
101 South Tryon Street, Suite 4000
Charlotte, NC 28280-4000
Tel Charlotte Office (704) 444-1000
Fax Charlotte Office (704) 444-1111
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:

Dow AgroSciences LLC

By: Andrew T Borucki

Print Name: Andrew T Borucki

Title: General Patent Counsel

Date: Feb 5, 2010

ALSTON & BIRD LLP

Bank of America Plaza

101 South Tryon Street, Suite 4000

Charlotte, NC 28280-4000

Tel Charlotte Office (704) 444-1000

Fax Charlotte Office (704) 444-1111

LEGAL02/31372667v1

Electronic Acknowledgement Receipt	
EFS ID:	7119638
Application Number:	11938359
International Application Number:	
Confirmation Number:	3820
Title of Invention:	Corn Event DAS-59122-7 and Methods for Detection Thereof
First Named Inventor/Applicant Name:	James Wayne Bing
Customer Number:	27142
Filer:	Bruce J. Rose/Kim Shaul
Filer Authorized By:	Bruce J. Rose
Attorney Docket Number:	1895D4
Receipt Date:	02-MAR-2010
Filing Date:	12-NOV-2007
Time Stamp:	11:31:16
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	Power of Attorney	POA384480.pdf	116844 36e19e86e1a94d5af93322863f847f86133d a11c	no	4
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.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/938,359	11/12/2007	James Wayne Bing	035718/384480

CONFIRMATION NO. 3820

POA ACCEPTANCE LETTER

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: 03/09/2010

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 03/02/2010.

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.

/vvan/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/938,359	11/12/2007	James Wayne Bing	1895D4

27142
MCKEE, VOORHEES & SEASE, P.L.C.
ATTN: PIONEER HI-BRED
801 GRAND AVENUE, SUITE 3200
DES MOINES, IA 50309-2721

CONFIRMATION NO. 3820
POWER OF ATTORNEY NOTICE



Date Mailed: 03/09/2010

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 03/02/2010.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

/vvan/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No.: 11/938,359 Confirmation No.: 3820
Applicant(s): Bing, *et al.*
Filed: November 12, 2007
Art Unit: 1638
Examiner: Kubelik, Anne R.
Title: CORN EVENT DAS-59122-7 AND METHODS FOR DETECTION
THEREOF

Docket No.: 035718/384480
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 February 9, 2010, 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 5 of this paper.

Amendments to the Claims:

1. (Cancelled)

2. (Currently amended) A corn plant comprising in its genome ~~the~~ a DNA construct ~~of claim 1~~, linked to at least one flanking region, wherein:

(a) said flanking region comprises a nucleotide sequence selected from the group consisting of the nucleotide sequence set forth in SEQ ID NO: 19 and the nucleotide sequence set forth in SEQ ID NO: 20;

(b) said DNA construct comprises a first, a second, and a third expression cassette;

(c) said first expression cassette comprises in operable linkage

(i) a maize ubiquitin promoter,

(ii) a 5' untranslated exon of a maize ubiquitin gene,

(iii) a maize ubiquitin first intron,

(iv) a Cry34Abl encoding DNA molecule, and

(v) a PinII transcriptional terminator;

(d) said second expression cassette comprises in operable linkage

(vi) a wheat peroxidase promoter,

(vii) a Cry35Abl encoding DNA molecule, and

(viii) a PinII transcriptional terminator; and

(e) said third expression cassette comprises in operable linkage

(ix) a cauliflower mosaic virus (CaMV) 35S promoter;

(x) a pat encoding DNA molecule; and

(xi) a 3' transcriptional terminator from CaMV 35S.

3. (Cancelled)

4. (New) The plant of claim 2, wherein said DNA construct comprises the nucleotide sequence set forth in SEQ ID NO: 24.

5. (New) The plant of claim 2, wherein said DNA construct is linked to a first and a second flanking region.

6. (New) The plant of claim 5, wherein said first flanking region comprises the nucleotide sequence set forth in SEQ ID NO: 19 and said second flanking region comprises the nucleotide sequence set forth in SEQ ID NO: 20.

7. (New) The plant of claim 6, wherein said DNA construct comprises the nucleotide sequence set forth in SEQ ID NO: 24.

8. (New) The plant of claim 2, wherein said plant is a seed.

9. (New) The plant of claim 4, wherein said plant is a seed.

9. (New) The plant of claim 5, wherein said plant is a seed.

10. (New) The plant of claim 6, wherein said plant is a seed.

11. (New) The plant of claim 7, wherein said plant is a seed.

12. (New) A plant comprising in its genome the nucleotide sequence set forth in SEQ ID NO: 23.

13. (New) The plant of claim 12, wherein said plant is a corn plant.

Appl. No.: 11/938,359
Amdt. dated May 7, 2010
Reply to Office Action of February 9, 2010

14. (New) A seed comprising in its genome the nucleotide sequence set forth in SEQ ID NO: 23.

15. (New) The seed of claim 14, wherein said seed is a corn seed.

REMARKS/ARGUMENTS

Status of the Claims

Claims 1-3 stand rejected.

Applicants have cancelled claims 1 and 3 without prejudice or disclaimer.

Applicants have amended claim 2 to independent form by incorporating the limitations of claim 1, now cancelled. Applicants have further amended claim 2 to incorporate the limitations of dependent claim 3, now cancelled. Finally, Applicants have amended claim 2 to recite that the corn plant comprises in its genome a DNA construct linked to at least one flanking region comprising a nucleotide sequence selected from the group consisting of the nucleotide sequence set forth in SEQ ID NO: 19 and the nucleotide sequence set forth in SEQ ID NO: 20. The amendments to claim 2 are fully supported by Applicants' original disclosure and thus, do not introduce new matter.

Applicants expressly reserve the right to file one or more continuing applications or take such other actions deemed necessary to protect the full scope of subject matter encompassed by the claims prior to the claim cancellations and other claim amendments made herein.

Applicants have added new claims 4-15. New claims 4-11 are directed to various embodiments of the plant of amended claim 2. New claims 12-15 are directed to plants and seeds comprising in their genomes DNA that is characteristic of event DAS-59122-7. The new claims are fully supported by Applicants' original disclosure and thus, do not introduce new matter.

Particular support for the amendment of claim 2 and the new claims can be found in original claims 1-3, Figures 1-3, the sequence listing, and other portions of the specification, including, for example, pages 3 (lines 23-31), 4 (lines 1-16), 5 (lines 14-19),

Appl. No.: 11/938,359
Amdt. dated May 7, 2010
Reply to Office Action of February 9, 2010

8 (lines 15-20), 9 (lines 8-12), 11 (lines 19-29), 26 (lines 17-32), 27 (lines 1-32), and 28 (lines 1-5).

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

The Rejection of the Claims Under 35 U.S.C. § 103(a) Should Be Withdrawn

Claims 1-3 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Narva *et al.* (2002, U.S. Patent No. 6,372,480) in view of Boets *et al.* (U.S. Patent Application Publication No. 20020199215), taken with evidence of Crickmore *et al.* (2009, http://www.lifesci.sussex.ac.uk/Home/Neil_Crickmore/Bt/). Claims 1 and 3 have been cancelled. Claim 2 has been amended. New claims 4-15 have been added. This rejection is respectfully traversed and should not be applied to the new claims.

The Examiner alleges that at the time the invention was made, it would have been obvious to one of ordinary skill in the art to modify the DNA construct taught by Narva *et al.*, to use the wheat peroxidase promoter in the construct as described by Boets *et al.*

Without acquiescing to this position of the Office, Applicants have amended claim 2 in the interest of expediting prosecution of the instant application and not to limit the scope of their claimed invention. As amended, claim 2 is directed to a corn plant comprising the DNA construct of claim 1 (now cancelled) linked to at least one flanking region comprising a nucleotide sequence selected from the group consisting of the nucleotide sequence set forth in SEQ ID NO: 19 and the nucleotide sequence set forth in SEQ ID NO: 20.

Applicants respectfully submit that amended claim 2 is not obvious in view of the cited combination of references because these references do not teach or even suggest a corn plant comprising the DNA construct of claim 1 linked to at least one flanking region comprising a nucleotide sequence selected from the group consisting of the nucleotide

Appl. No.: 11/938,359
Amdt. dated May 7, 2010
Reply to Office Action of February 9, 2010

sequence set forth in SEQ ID NO: 19 and the nucleotide sequence set forth in SEQ ID NO: 20. Moreover, the Examiner has not stated a prima facie case of obvious against claim 2 as amended herein.

Applicants also respectfully submit that the new claims are not obvious in view of the cited combination of references. Because new claims 4-11 depend either directly or indirectly from amended claim 2, Applicants believe that these new claims are not obvious in view of the cited combination of references for the same reasons as stated above for amended claim 2. Applicants believe that new claims 12-15 are not obvious in view of the cited combination of references because these claims are directed to plants and seeds comprising in their genomes DNA that is characteristic of event DAS-59122-7. The cited combination of references does not teach or even suggest any DNA sequence that is characteristic of event DAS-59122-7, let alone plants and seeds comprising such a DNA sequence.

In view of the amendments and remarks, it is submitted that the rejection of the claims under 35 U.S.C. § 103(a) should be withdrawn and not applied to the newly submitted claims.

CONCLUSIONS

In view of the above amendments and remarks, Applicants submit that the rejections of the claims under 35 U.S.C. § 103(a) are overcome. Applicants respectfully submit 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

Appl. No.: 11/938,359
Amdt. dated May 7, 2010
Reply to Office Action of February 9, 2010

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 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

Customer No. 29122
ALSTON & BIRD LLP
Bank of America Plaza
101 South Tryon Street, Suite 4000
Charlotte, NC 28280-4000
Tel Raleigh Office (919) 862-2200
Fax Raleigh Office (919) 862-2260

ELECTRONICALLY FILED USING THE EFS-WEB ELECTRONIC FILING SYSTEM OF THE UNITED STATES
PATENT & TRADEMARK OFFICE ON MAY 7, 2010.

Electronic Acknowledgement Receipt

EFS ID:	7569158
Application Number:	11938359
International Application Number:	
Confirmation Number:	3820
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:	035718/384480
Receipt Date:	07-MAY-2010
Filing Date:	12-NOV-2007
Time Stamp:	11:13:50
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		384480-Amendment.pdf	123270 6d11c5b092f842fe0d52776c7b6bf767034e833c	yes	8

	Multipart Description/PDF files in .zip description		
	Document Description	Start	End
	Amendment/Req. Reconsideration-After Non-Final Reject	1	1
	Claims	2	4
	Applicant Arguments/Remarks Made in an Amendment	5	8
Warnings:			
Information:			
Total Files Size (in bytes):		123270	
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 11/938,359		Filing Date 11/12/2007		☐ To be Mailed	
APPLICATION AS FILED – PART I										
(Column 1)			(Column 2)			SMALL ENTITY ☐ OR		OTHER THAN SMALL ENTITY		
FOR	NUMBER FILED	NUMBER EXTRA	RATE (\$)	FEE (\$)	OR	RATE (\$)	FEE (\$)			
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A				
☐ SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A			N/A				
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A				
TOTAL CLAIMS (37 CFR 1.16(j))	minus 20 =	*	X \$ =		OR	X \$ =				
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X \$ =			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 \$250 (\$125 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			TOTAL				
APPLICATION AS AMENDED – PART II										
(Column 1)			(Column 2)			SMALL ENTITY OR		OTHER THAN SMALL ENTITY		
AMENDMENT	05/07/2010	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	OR	RATE (\$)	ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(i))	* 13	Minus	** 20	= 0	X \$ =		OR	X \$52=	0
	Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X \$ =		OR	X \$220=	0
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))									
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	0
AMENDMENT	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	OR	RATE (\$)	ADDITIONAL FEE (\$)		
	Total (37 CFR 1.16(i))	*	Minus	**	=	X \$ =		OR	X \$ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X \$ =		OR	X \$ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))									
						TOTAL ADD'L FEE		OR	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.										

Legal Instrument Examiner:
/DIANE WILLIAMS/

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.

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 11/938,359		Filing Date 11/12/2007		☐ To be Mailed		
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						
☐ SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A		N/A						
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A		N/A						
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X \$ =		X \$ =						
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X \$ =		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 \$250 (\$125 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))											
			TOTAL				TOTAL				
* 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		OR OTHER THAN SMALL ENTITY		
AMENDMENT	05/07/2010	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	RATE (\$)	ADDITIONAL FEE (\$)			
	Total (37 CFR 1.16(i))	* 13	Minus	** 20	= 0	X \$ =		OR	X \$52=	0	
	Independent (37 CFR 1.16(h))	* 3	Minus	*** 3	= 0	X \$ =		OR	X \$220=	0	
	☐ Application Size Fee (37 CFR 1.16(s))										
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))										
						TOTAL ADD'L FEE		OR		TOTAL ADD'L FEE	
									0		
AMENDMENT	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 \$ =		OR	X \$ =		
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X \$ =		OR	X \$ =		
	☐ Application Size Fee (37 CFR 1.16(s))										
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))										
						TOTAL ADD'L FEE		OR		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.											

Legal Instrument Examiner:
/DIANE WILLIAMS/

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
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/938,359	11/12/2007	James Wayne Bing	035718/384480	3820
29122 7590 07/09/2010 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 1638	PAPER NUMBER
			MAIL DATE 07/09/2010	DELIVERY MODE 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.

Office Action Summary	Application No.		Applicant(s)	
	11/938,359		BING ET AL.	
	Examiner		Art Unit	
	Anne R. Kubelik		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 07 May 2010.

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

3) ☐ 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

4) ☒ Claim(s) 2 and 4-15 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) 2 and 4-15 is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

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

10) ☐ 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).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

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) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.	4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____. 5) ☐ Notice of Informal Patent Application 6) ☐ Other: _____.
---	--

DETAILED ACTION

1. Claims 2 and 4-15 are pending.
2. The rejection of claims 1-3 under 35 U.S.C. 103(a) as being unpatentable over Narva et al (2002, US Patent 6,372,480) in view of Boets et al (US Patent Application Publication 2002/0199215), taken with the evidence of Crickmore et al (2009, http://www.lifesci.sussex.ac.uk/Home/Neil_Crickmore/Bt/) is withdrawn in light of Applicant's amendment of the claims.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

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.
4. Claims 2 and 4-15 are rejected under 35 USC 112, first paragraph, as containing subject matter that 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 drawn to corn plants comprising SEQ ID NO:19, a DNA construct comprising a first expression cassette comprising in operable linkage a maize ubiquitin promoter, a 5' untranslated exon of a maize ubiquitin gene, a maize ubiquitin first intron, a Cry34Ab1 encoding DNA molecule, and a PinII transcriptional terminator; a second expression cassette comprising in operable linkage a wheat peroxidase promoter, a Cry35Ab1 encoding DNA molecule, and a PinII transcriptional terminator; and a third expression cassette comprising in operable linkage aCaMV 35S promoter; a pat encoding DNA molecule; and a 3' transcriptional

terminator from CaMV 35S, and SEQ ID NO:20. SEQ ID NO:19 and 20 are flanking sequences of corn event DAS-59122-7.

The only such corn plants taught in the specification are event DAS-59122-7 plants.

Since event DAS-59122-7 plants are essential to the claimed invention, they must be obtainable by a repeatable method set forth in the specification or otherwise be readily available to the public. If a seed comprising event DAS-59122-7 is not so obtainable or available, a deposit thereof may satisfy the requirements of 35 U.S.C. 112. The specification does not disclose a repeatable process to obtain the exact same seed in each occurrence and 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.

Double Patenting

5. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

6. Claim 2 and 4-15 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent No. 7,323,556. Although the conflicting claims are not identical, they are not patentably distinct from each other.

Applicant's amendment of the claims is such that the claimed invention reads on the invention I in the restriction mailed 17 September 2007 in parent application 11/237,22, now U.S. Patent No. 7,323,556; this is the invention elected in that application.

SEQ ID NO:23, claimed in the issued patent, makes obvious corn plants comprising it, as claimed in the instant application, because SEQ ID NO:23 comprises SEQ ID NO:19, a DNA construct comprising a first expression cassette comprising in operable linkage a maize ubiquitin promoter, a 5' untranslated exon of a maize ubiquitin gene, a maize ubiquitin first intron, a Cry34Ab1 encoding DNA molecule, and a PinII transcriptional terminator; a second expression cassette comprising in operable linkage a wheat peroxidase promoter, a Cry35Ab1 encoding DNA molecule, and a PinII transcriptional terminator; and a third expression cassette comprising in operable linkage a CaMV 35S promoter; a pat encoding DNA molecule; and a 3' transcriptional terminator from CaMV 35S, and SEQ ID NO:20. As SEQ ID NO:19 and 20, and thus SEQ ID NO:23, are derived from the insertion of the DNA construct into a specific site in a corn plant genome, these nucleic acids make obvious corn plants comprising them.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO**

Art Unit: 1638

MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. 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.

July 10, 2010

/Anne R Kubelik/

Primary Examiner, Art Unit 1638

Search Notes 	Application/Control No. 11938359	Applicant(s)/Patent Under Reexamination BING ET AL.
	Examiner Anne R Kubelik	Art Unit 1638

SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
STN	7/21/09	ark
EAST	7/21/09	ark
http://www.lifesci.sussex.ac.uk/home/Neil_Crickmore/Bt/index.html	7/21/09	ark
SEQ ID NO:19 and 20	5/17/10	ark

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

--	--

REQUEST For CONTINUED EXAMINATION (RCE) TRANSMITTAL Address to: MAIL STOP RCE COMMISSIONER FOR PATENTS P.O. BOX 1450 ALEXANDRIA, VA 22313-1450 (Revised 04/2005)	Application Number: 11/938,359
	Filing Date: November 12, 2007
	First Named Inventor: James Wayne Bing
	Art Unit: 1638
	Examiner Name: Kubelik, Anne R.
	Confirmation No.: 3820
	Attorney Docket No.: 035718/384480
This is a request for <u>Continued Examination (RCE)</u> under 37 C.F.R. § 1.114 of the above-identified application. Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application.	

1. **Submission required under 37 C.F.R. § 1.114** Note: if the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).
 - a. ☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.
 - i. ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on
 - ii. ☐ Other
 - b. ☒ Enclosed
 - i. ☐ Amendment/Reply
 - ii. ☐ Affidavits(s)/Declarations(s)
 - iii. ☒ Information Disclosure Statement (IDS); four of cites listed on PTO Form 1449
 - iv. ☒ Other: Amendment After Final Under 37 CFR §1.116, Terminal Disclaimer Under 37 C.F.R. § 1.321(c)
2. **Miscellaneous**
 - a. ☐ Suspension of action on the above-identified application is requested under 37 C.F.R. §1.103(c) for a period of ___ months. (Period of suspension shall not exceed 3 months; Fee under 37 C.F.R. § 1.17(g) required)
 - b. ☐ Other

3. **Fees** The RCE fee under 37 C.F.R. § 1.17(e) is **required** by 37 C.F.R. § 1.114 when the RCE is filed.
- a. The Director is hereby authorized to charge any fee deficiencies, or credit any overpayments to Deposit Account No. 16-0605.
- i. ☒ RCE fee required under 37 C.F.R. § 1.17(e)
(\$810.00 large entity; \$405.00 small entity)
- ii. ☐ Extension of Time Fee (37 C.F. R. §§ 1.136 and 1.17)
- iii. ☒ Other: **Fee for Terminal Disclaimer - \$140.00 large entity**
- b. ☐ Check in the amount of \$___enclosed

Respectfully submitted,

/david m. saravitz/

David M. Saravitz
Registration No. 55,593

Customer No. 29122
ALSTON & BIRD LLP
Bank of America Plaza
101 South Tryon Street, Suite 4000
Charlotte, NC 28280-4000
Tel Raleigh Office (919) 862-2200
Fax Raleigh Office (919) 862-2260

ELECTRONICALLY FILED USING THE EFS-WEB ELECTRONIC FILING SYSTEM OF THE UNITED STATES PATENT & TRADEMARK OFFICE ON **August 20, 2010**.

Attorney's Docket No. 035718/384480

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re:	Bing et al.	Confirmation No.:	3820
Appl. No.:	11/938,359	Art Unit:	1638
Filed:	November 12, 2007	Examiner:	Kubelik, Anne R.
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
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,

/david m. saravitz/

David M. Saravitz
Registration No. 55,593

Customer No. 29122
ALSTON & BIRD LLP
Bank of America Plaza
101 South Tryon Street, Suite 4000
Charlotte, NC 28280-4000
Tel Raleigh Office (919) 862-2200
Fax Raleigh Office (919) 862-2260

ELECTRONICALLY FILED USING THE EFS-WEB ELECTRONIC FILING SYSTEM OF THE UNITED STATES PATENT & TRADEMARK OFFICE ON AUGUST 20, 2010.

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	11/938,359
				Filing Date	November 12, 2007
				First Named Inventor	James Wayne Bing
				Art Unit	1638
Examiner Name	Kubelik, Anne R.				
Sheet	1	of	1	Attorney Docket Number	035718/384480

U. S. 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
	12	Database EMBL, "PUFTW67TB ZM_0.6_1.0_KB Zea mays genomic clone ZMMBTa0732K13, genomic surgery sequence," 2003, retrieved from EBI accession no. EM_PRO:CG069192.	
	13	LOWE, <i>et al.</i> , "A computer program for selection of oligonucleotide primers for polymerase chain reactions," <i>Nucleic Acid Research</i> , 1990, Vol. 18(7), pp. 1757-1761.	
	14	WHITELAW, <i>et al.</i> , GenBank Accession No. BZ739496, 2003.	
	15	ZAMBRYSKI, <i>et al.</i> , GenBank Accession No. 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.

PATENT

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

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No.: 11/938,359 Confirmation No.: 3820
Applicant(s): Bing et al.
Filed: November 12, 2007
Art Unit: 1638
Examiner: Kubelik, Anne R.
Title: CORN EVENT DAS-59122-7 AND METHODS FOR DETECTION
THEREOF

Docket No.: 035718/384480
Customer No.: 29122

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

AMENDMENT AFTER FINAL UNDER 37 CFR § 1.116

Sir:

In response to the Final Office Action dated July 9, 2010, please amend the above-identified application as follows:

A Listing of the Claims begins on page 2 of this paper.

Remarks/Arguments begin on page 5 of this paper.

Listing of the Claims:

1. (Cancelled)

2. (Previously presented) A corn plant comprising in its genome a DNA construct linked to at least one flanking region, wherein:

(a) said flanking region comprises a nucleotide sequence selected from the group consisting of the nucleotide sequence set forth in SEQ ID NO: 19 and the nucleotide sequence set forth in SEQ ID NO: 20;

(b) said DNA construct comprises a first, a second, and a third expression cassette;

(c) said first expression cassette comprises in operable linkage

(i) a maize ubiquitin promoter,

(ii) a 5' untranslated exon of a maize ubiquitin gene,

(iii) a maize ubiquitin first intron,

(iv) a Cry34Abl encoding DNA molecule, and

(v) a PinII transcriptional terminator;

(d) said second expression cassette comprises in operable linkage

(vi) a wheat peroxidase promoter,

(vii) a Cry35Abl encoding DNA molecule, and

(viii) a PinII transcriptional terminator; and

(e) said third expression cassette comprises in operable linkage

(ix) a cauliflower mosaic virus (CaMV) 35S promoter;

(x) a pat encoding DNA molecule; and

(xi) a 3' transcriptional terminator from CaMV 35S.

3. (Cancelled)

4. (Previously presented) The plant of claim 2, wherein said DNA construct comprises the nucleotide sequence set forth in SEQ ID NO: 24.

5. (Previously presented) The plant of claim 2, wherein said DNA construct is linked to a first and a second flanking region.

6. (Previously presented) The plant of claim 5, wherein said first flanking region comprises the nucleotide sequence set forth in SEQ ID NO: 19 and said second flanking region comprises the nucleotide sequence set forth in SEQ ID NO: 20.

7. (Previously presented) The plant of claim 6, wherein said DNA construct comprises the nucleotide sequence set forth in SEQ ID NO: 24.

8. (Previously presented) The plant of claim 2, wherein said plant is a seed.

9. (Previously presented) The plant of claim 4, wherein said plant is a seed.

9. (Previously presented) The plant of claim 5, wherein said plant is a seed.

10. (Previously presented) The plant of claim 6, wherein said plant is a seed.

11. (Previously presented) The plant of claim 7, wherein said plant is a seed.

12. (Previously presented) A plant comprising in its genome the nucleotide sequence set forth in SEQ ID NO: 23.

13. (Previously presented) The plant of claim 12, wherein said plant is a corn plant.

Appl. No.: 11/938,359
Amdt. Dated August 20, 2010
Reply to Office Action of July 9, 2010

14. (Previously presented) A seed comprising in its genome the nucleotide sequence set forth in SEQ ID NO: 23.

15. (Previously presented) The seed of claim 14, wherein said seed is a corn seed.

Appl. No.: 11/938,359
Amdt. Dated August 20, 2010
Reply to Office Action of July 9, 2010

REMARKS/ARGUMENTS

Status of the Claims

Claims 2 and 4-15 are pending and stand rejected.

Reexamination and reconsideration of the application are respectfully requested in view of the following remarks and accompanying terminal disclaimer.

The Rejections of the Claims Under 35 U.S.C. § 112, First Paragraph, Should Be Withdrawn

Claims 2 and 4-15 have been rejected under 35 U.S.C. § 112, first paragraph, for failing to comply with the enablement requirement. The Office Action indicates that because DAS-59122-7 plants are essential to the invention, they must be attainable by a repeatable method set forth in the specification or otherwise be readily available to the public. 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. The Office Action then states that the specification does not disclose a repeatable method to obtain the exact same seed and that it is not apparent if such a seed is readily available to the public.

Upon allowance, Applicants will deposit maize seeds comprising event DAS-59122-7 under the provisions of 37 C.F.R. § 1.804 and amend the specification to add the indentifying information set forth in 37 C.F.R. § 1.809(d) including:

- (1) the accession number for the deposit;
- (2) the date of the deposit;
- (3) a description of the deposited biological material sufficient to specifically identify it and to permit examination; and
- (4) the name and address of the depository.

Appl. No.: 11/938,359
Amdt. Dated August 20, 2010
Reply to Office Action of July 9, 2010

Applicants assure the Examiner that at least 2,500 maize seeds comprising event DAS-59122-7 will be deposited with the ATCC and accession numbers will be inserted into the application once allowable claims are determined. Applicant provides assurance that:

- (a) during the pendency of this 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 thirty years, or five years after the last request for the enforceable life of the patent, whichever is longer;
- (d) a test of the viability of the biological material at the time of deposit was conducted; and
- (e) the deposit will be replaced if it should ever become inviable.

In view of the foregoing remarks, the Examiner is respectfully requested to withdraw the rejection of claims 2 and 4-15 under 35 U.S.C. § 112, first paragraph.

The Rejection of the Claims for Obviousness-Type Double Patenting Should Be Withdrawn

Claims 2 and 4-15 have been rejected on the ground of non-statutory, obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent No. 7,323,556.

To overcome this rejection, Applicants submit concurrently herewith a terminal disclaimer in compliance with 37 C.F.R. § 1.321(c). In view of the terminal disclaimer, it is submitted that the rejections of the claims under the judicially created doctrine of obviousness-type, double patenting should be withdrawn.

Appl. No.: 11/938,359
Amdt. Dated August 20, 2010
Reply to Office Action of July 9, 2010

CONCLUSIONS

In view of the above amendments and remarks, Applicants submit that the rejections of the claims under 35 U.S.C. § 112, first paragraph, and the doctrine of non-statutory, obviousness-type double patenting are overcome. Applicants respectfully submit 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 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

Customer No. 29122
ALSTON & BIRD LLP
Bank of America Plaza
101 South Tryon Street, Suite 4000
Charlotte, NC 28280-4000
Tel Raleigh Office (919) 862-2200
Fax Raleigh Office (919) 862-2260

ELECTRONICALLY FILED USING THE EFS-WEB ELECTRONIC FILING SYSTEM OF THE UNITED STATES PATENT & TRADEMARK OFFICE ON AUGUST 20, 2010.

Attorney's Docket No. 035718/384480

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re:	Bing et al.	Confirmation No.:	3820
Appl. No.:	11/938,359	Group Art Unit:	1638
Filed:	November 12, 2007	Examiner:	Kubelik, Anne R.
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

TERMINAL DISCLAIMER UNDER 37 C.F.R. § 1.321(c)

I, David M. Saravitz, am an attorney of record of the disclaimants: Pioneer Hi-Bred International, Inc., having a principal place of business at 7100 NW 62nd Avenue, P.O. Box 1014, Johnston, Iowa 50131-1014; E.I. du Pont de Nemours and Company, having a principal place of business at Market Street, Wilmington, Delaware 19898; and Dow AgroSciences LLC, having a principal place of business at 9330 Zionsville Road, Indianapolis, Indiana 46268. I am authorized to execute this disclaimer on behalf of Pioneer Hi-Bred International, Inc., E.I. du Pont de Nemours and Company, and Dow AgroSciences LLC. Together, the disclaimants, Pioneer Hi-Bred International, Inc., E.I. du Pont de Nemours and Company, and Dow AgroSciences LLC, are owners of all right, title, and interest in the above-identified application, by a first Assignment filed October 19, 2005 and recorded at Reel 016658, Frame 0251, and a second Assignment filed December 9, 2005, and recorded at Reel 016876, Frame 0849.

The disclaimants hereby disclaim the terminal part of any patent granted on the above-identified application which would extend beyond the expiration date of the full statutory term of United States Patent No. 7,323,556, issued January 29, 2008, entitled CORN EVENT DAS-59122-7 AND METHODS FOR DETECTION THEREOF, which patent was assigned to the above-identified disclaimants by a first Assignment filed October 19, 2005 and recorded at Reel 016658, Frame 0251, and a second Assignment filed December 9, 2005, and recorded at Reel 016876, Frame 0849.

Disclaimants further agree that any patent so granted on the above-identified application, which is the subject of this disclaimer, shall be enforceable only for and during such period that said patent is commonly owned with U.S. Patent No. 7,323,556, this agreement to run with any

LEGAL02/32114971v1

In re: Bing et al.
Appl. No.: 11/938,359
Filing Date: November 12, 2007
Page 2

patent granted on the above-identified application and to be binding upon the grantee, its successors or assigns.

Nothing herein shall be construed as a disclaimer of any terminal part of any patent granted on the above-identified application which is prior to the expiration of the full statutory term of U.S. Patent No. 7,323,556 in the event that it later expires for failure to pay a maintenance fee, is held unenforceable, is found invalid, is statutorily disclaimed in whole or terminally disclaimed under 37 C.F.R. § 1.321(c), has all claims cancelled by a reexamination certificate, or is otherwise terminated prior to expiration of its statutory term as presently shortened by any terminal disclaimer, except for the separation of common ownership stated above.

Respectfully submitted,

/david m. saravitz/

David M. Saravitz
Registration No. 55,593

Date: August 20, 2010
CUSTOMER NO. 29122
ALSTON & BIRD LLP
Bank of America Plaza
101 South Tryon Street, Suite 4000
Charlotte, NC 28280-4000
Tel Charlotte Office (704) 444-1000
Fax Charlotte Office (704) 444-1111

Electronic Patent Application Fee Transmittal				
Application Number:		11938359		
Filing Date:		12-Nov-2007		
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:		035718/384480		
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:				
Request for continued examination	1801	1	810	810
Statutory disclaimer	1814	1	140	140
Total in USD (\$)				950

Electronic Acknowledgement Receipt	
EFS ID:	8255511
Application Number:	11938359
International Application Number:	
Confirmation Number:	3820
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:	035718/384480
Receipt Date:	20-AUG-2010
Filing Date:	12-NOV-2007
Time Stamp:	11:37:11
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	\$ 950
RAM confirmation Number	5036
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	Request for Continued Examination (RCE)	1895D4_384480_RCE.pdf	98710	no	2
			e75a06e56b451efd271a170b41c001dba491605f		
Warnings:					
This is not a USPTO supplied RCE SB30 form.					
Information:					
2	Transmittal Letter	1895D4_384480_IDS.pdf	83768	no	1
			97a49edd739fba5e13ff1543da92106452fa26a7		
Warnings:					
Information:					
3	Information Disclosure Statement (IDS) Filed (SB/08)	1895D4_384480_1449.pdf	115486	no	1
			4d7219326c63795d90524fb19dea3734489c5c29		
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
4	NPL Documents	EMBL-PUFTW67TB-ZM.pdf	61267	no	2
			776a75fb5dee07fa8a56c46d796166e50ca4096		
Warnings:					
Information:					
5	NPL Documents	Lowe.pdf	805767	no	5
			e46d92963c5a1f654b502da433cc315674934949		
Warnings:					
Information:					
6	NPL Documents	Whitelaw.pdf	49054	no	2
			b4e5178df9fd54fc820aca1636db249688bf3e2		
Warnings:					
Information:					
7	NPL Documents	Zambryski.pdf	39726	no	1
			e5cd05817b83a4ab594c6fffc07bc187fa97a67		
Warnings:					
Information:					

8		1895D4_384480_Amendment AF.pdf	101591 98abc22dae6b429b7ecc1fbb77fa6cda124cd1f4	yes	7
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Amendment After Final		1	1	
	Claims		2	4	
	Applicant Arguments/Remarks Made in an Amendment		5	7	
Warnings:					
Information:					
9	Statutory disclaimers per MPEP 1490.	1895D4_384480_TerminalDisclaimer.pdf	84706 0ef49e2f699b35486d73b14d04f747e821047ff3	no	2
Warnings:					
Information:					
10	Fee Worksheet (PTO-875)	fee-info.pdf	31677 9b1328e74e8ff16aabecfc77aff440e8070f4396	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			1471752		
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 11/938,359		Filing Date 11/12/2007		☐ To be Mailed	
APPLICATION AS FILED – PART I										
(Column 1)			(Column 2)		SMALL ENTITY ☐ OR		OTHER THAN SMALL ENTITY			
FOR	NUMBER FILED	NUMBER EXTRA	RATE (\$)	FEE (\$)	OR	RATE (\$)	FEE (\$)			
☒ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	310			
☐ SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A			N/A				
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A				
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X \$ =		OR	X \$ =				
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X \$ =			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 \$250 (\$125 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			TOTAL	310			
APPLICATION AS AMENDED – PART II										
(Column 1)			(Column 2)		(Column 3)		SMALL ENTITY OR		OTHER THAN SMALL ENTITY	
AMENDMENT	08/20/2010	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	OR	RATE (\$)	ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(i))	* 14	Minus	** 20	= 0	X \$ =		OR	X \$2= 0	
	Independent (37 CFR 1.16(h))	* 3	Minus	*** 3	= 0	X \$ =		OR	X \$220= 0	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))									
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	0	
AMENDMENT	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	OR	RATE (\$)	ADDITIONAL FEE (\$)		
	Total (37 CFR 1.16(i))	*	Minus	**	=	X \$ =		OR	X \$ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X \$ =		OR	X \$ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))									
					TOTAL ADD'L FEE		OR	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.										

Legal Instrument Examiner:
/GLORIA TRAMMELL/

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.

Application Number 	Application/Control No. 11/938,359	Applicant(s)/Patent under Reexamination BING ET AL.	
Document Code - DISQ		Internal Document – DO NOT MAIL	

TERMINAL DISCLAIMER	☒ APPROVED	☐ DISAPPROVED
Date Filed : 20 AUG 2010	This patent is subject to a Terminal Disclaimer	

Approved/Disapproved by:
JAB

U.S. Patent and Trademark Office

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	11/938,359
				Filing Date	November 12, 2007
				First Named Inventor	James Wayne Bing
				Art Unit	1638
Examiner Name	Kubelik, Anne R.				
Sheet	1	of	1	Attorney Docket Number	035718/384480

U. S. 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
	16	US-5,474,796	12-12-1995	Brennan	
	17	US-5,541,308	07-30-1996	Hogan et al.	
	18	US-6,232,063	05-15-2001	Beckmann et al.	
	19	US-6,458,584	10-01-2002	Mirzabekov et al.	
	20	US-6,825,400	11-30-2004	Behr et al.	
	21	US-7,112,721	09-26-2006	Fabijanski et al.	
	22	US-7,323,556	01-29-2008	Bing et al.	
	23	US-2002/0013960	01-31-2002	Behr et al.	
	24	US-2002/0102582	08-01-2002	Levine	
	25	US-2003/0198943	10-23-2003	Remacle et al.	
	26	US-2006/0141495	06-29-2006	Kunsheng	
	27	US-2008/0166725	07-10-2008	Bing et al.	
	28	US-2008/0166726	07-10-2008	Bing et al.	
	29	US-2008/0171334	07-17-2008	Bing et al.	
	30	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
	31	EP 0 857 791 A2	12-08-1998	Boehringer Mannheim GmbH		

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
	32	BUCK, <i>et al.</i> , "Design Strategies and Performance of Custom DNA Sequencing Primers," <i>BioTechniques</i> , 1999, Vol. 27, pp. 528-536	
	33	Sequence Search Reports, OM nucleic – nucleic search, 2009, pp. 1-6.	
	34	Stratagene Catalog, page 40, 1988.	

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.



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11) EP 0 857 791 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
12.08.1998 Bulletin 1998/33

(51) Int. Cl.⁶: C12Q 1/68

(21) Application number: 97122253.4

(22) Date of filing: 17.12.1997

(84) Designated Contracting States:
AT BE CH DE DK ES FI FR GB GR IE IT LI LU MC
NL PT SE
Designated Extension States:
AL LT LV MK RO SI

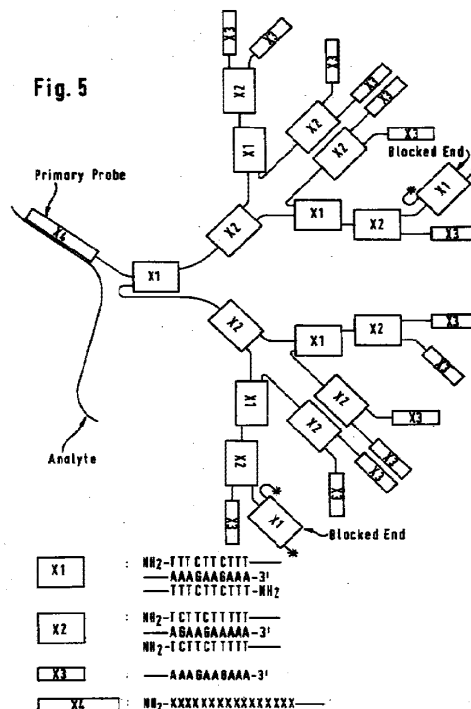
(30) Priority: 21.12.1996 EP 96120730

(71) Applicant:
BOEHRINGER MANNHEIM GMBH
68298 Mannheim (DE)

(72) Inventors:
• Orum, Henrik, Dr.
3500 Vorlose (DK)
• Koch, Troels, Dr.
2300 Kobenhaven S. (DK)
• Borre, Martin, Dr.
2640 Hedehusene (DK)
• Hansen, Henrik Frydenlund
2660 Rodovre (DK)

(54) Method of analysis using signal amplification

(57) A method for determining a molecule A comprising a sample of molecules capable of participating in formation of triplex structures is useful for sensitive determination. The principle can be used to determine any kind of analytes.



EP 0 857 791 A1

Description

Field of the invention

5 The present invention relates to chimeric nucleic acids compounds that have the capacity of forming triplex structures, to the production and purification of such chimeric compounds, and to their use in signal amplification techniques.

Background of the invention

10 Detection and quantification of nucleic acid molecules constitutes a fundamental trait in several diagnostic techniques. However, the amount of accessible nucleic acid target molecules in a specific sample is in general low, and direct hybridization with a polynucleotide probe therefore in many cases insufficient for detection. In the case of an infectious organism, the classical solution has been enrichment by culturing, but this is time-consuming and therefore unsuitable for rapid diagnosis. A way to circumvent these problems is to amplify the target molecule. This can be
15 accomplished in one of several ways, for example polymerase chain reaction (PCR, as it is described in US-A-4,683,195 or EP-A-0 630 971), ligase chain reaction (LCR, EP-A-0 320 308) or NASBA (EP-A-329 822). However, all of these techniques utilize enzymes for amplification of target nucleic acid molecules and, consequently, they suffer from the drawback that compounds in the sample specimen may inhibit these enzymes. Therefore, current protocols based on these techniques often include laborious sample preparation steps such as, for example purification and concentration of DNA. Furthermore, when the target sequence is amplified the risk of contamination becomes significantly
20 increased. Several methods have been described to overcome contamination problems, including 1) digestion with nucleases that specifically degrades nucleic acid molecules that have been produced during previous analysis (EP-A-0 401 037); and 2) special laboratory practice that minimises carry over between new samples and previously analysed material. However, methods for avoiding contamination and inhibition are in general costly and cumbersome.

25 Another solution for signal amplification would be to employ a method in which the number of signal-producing compounds is increased. Such methods have been described by for example EP-A-0 317 077, WO 95/01365 and WO 95/08000. These techniques utilize multi-valent intermediate probes containing a large amount of identical nucleotide sequences bound covalently to each other and each intermediate probe being capable of hybridizing with up to 50 signal producing secondary probes simultaneously. However, these techniques utilize large molecules as intermediate
30 probes which results in less favorable kinetics.

Thus, it would be highly desirable to have a method for signal amplification which is rapid, simple, sensitive, based on stable compounds and on non-enzymatical reactions.

Summary of the invention

35 Subject of the invention is therefore a method of determining a molecule A containing a sequence SA of nucleobases, said molecule being capable of forming a triple helix structure through said sequence SA comprising providing a reaction mixture containing multiple probe molecules B containing a first segment B1 capable of participating in a triple helix structure with A through sequence SA and a segment B2 that allows for direct or indirect detection, incubating
40 said reaction mixture at conditions allowing the formation of triple helices and determining the formation of triple helices using said segment B2.

A further subject of the invention is a molecule especially advantageous for this method.

A further object of the invention is a method for the determination of an analyte using the above mentioned method for determining a molecule A.

45 A further object of the invention is the use of multiple triple helix structures (triplex structures) for the determination of an analyte.

Brief description of the drawings

50 Figure 1A is a schematic illustration of structures formed from molecules A and probes B.

Figure 1B is a schematic illustration of structures showing how the structures of Figure 1A can be extended further.

In Figure 2 several ways to link probe segments are given. In the case of the segments comprising DNA and PNA formation of an intramolecular duplex is favored in case A and B. This means that cases C and D are preferred arrangements for forming triple helix structures. Figure 2 contains the nomenclature used throughout the specification for the
55 arrangement and orientation of strands.

In Figure 3 four possible orientations for triple helical structures are given. The arrangement in Figure 3A and 3D are the most preferred.

Figure 4 shows schematically the structure of an exemplified PNA while bound to DNA in the preferred antiparallel

mode. It further shows that nucleic acid analogues can be modified by the attachment of groups improving the solubility of the probe, in case of PNA the addition of a lysine residue.

Figure 5 gives a schematic picture of a construct formed in one of the exemplified methods according to the invention, wherein a target nucleic acid is analyzed using a primary probe, multiple probes composed of each a DNA and a PNA segment and secondary probes containing a reporter group, and having a blocked end that disables the probe in participating in further assembly. It shows that using the invention it is possible to obtain a multiplicity of labeling sites and therefore achieve signal amplification.

In Figure 6A a schematic picture is shown for an exemplified embodiment of the invention using a first probe B containing two segments B1 and B2, and a second probe C containing two segments C1 and C2. The segments B1 and C1 consist of PNA and the segments B2 and C2 consists of DNA.

Figure 6B shows the result of an assembly performed as in 6A but in the presence of four probes, termed B, C, D and E containing two segments each. Both segments of probes C and E consist of DNA, and both segments of probes B and D consist of PNA.

Figure 7 shows a sequence and binding mode of one molecule of probe C and two molecules of probe D, wherein the second segment of probe D can bind the first segment of probe C.

Figure 8 shows schematically a probe molecule containing two PNA segments, the amino ends being bound together covalently by a linker moiety L.

Figure 9 shows the mode in which two PNA molecules bind to one strand of DNA.

Figure 10 shows an assembly containing only one molecule B. In this case, B1 is PNA and B2 is nucleic acid.

Figure 11 shows the melting curves of complexes formed between the oligos of example 1 (denoted B1 and C2), measured at pH 4.75 and pH 9.5.

Figure 12 shows an autoradiogram showing the different starting compounds and reaction products for the formation of duplexes and triplexes.

Figure 13 shows an autoradiogram for the formation of a complex involving duplexes and a triplex, wherein the amount of the only duplex forming oligonucleotide is increased from lane 1 to lane 7 (0; 1; 5; 10; 20; 40; 100 pmol DA262). Lane 8 contains only the triplex forming component DA256.

Detailed description of the invention

A molecule A can be any moiety containing a sequence SA of nucleobases which sequence is preferably a least 9 bases long, most preferably is between 10 and 30 bases long. The nucleobases are preferably covalently linked in a linear manner to a backbone, especially in a way such that the molecule can bind by base pairing to a nucleic acid containing a sequence of bases complementary to the sequence of bases contained in molecule A. Examples of molecules A are nucleic acids, like RNA, DNA or derivatives thereof and nucleic acid analogues. In very preferred manner the nucleic acid is DNA. Molecule A can also be a molecular moiety, for example a protein or hapten to which a nucleic acid or nucleic acid analogue sequence is attached.

A can be a molecule originating from a sample wherein the presence, absence or amount of this molecule is intended to be determined and analyzed in presence/absence or/and amount, but molecule A can also be a probe or probe unit that is itself intended to be used for the determination of an analyte. Generally the intention behind the occurrence or use of the sequence SA in molecule A is to increase the number of binding sites for labels or the number of labels attached or attachable to molecule A. Therefore the origin and function of the part of molecule A not participating in amplifying a signal can be chosen according to the specific task to be solved. Further the amount of molecule A can be unknown, for example in methods for determining molecule A as an analyte in a sample, or it can be known, for example if a defined amount of molecules A is added to a sample, especially for determining an analyte (for example antigens, antibodies, haptens etc.) different from molecule A.

Sequence SA can contain natural nucleobases, like A, C, G, T and U, or non-natural bases, like 7-deaza-G and mixtures. The important feature of sequence SA is that it has the ability to bind a probe molecule B by base pairing.

A triple helix structure or triplex structure is composed of three strands of molecules, each containing a nucleobase sequence capable of base pairing. Preferably the mode of binding between the three strands involves both Watson/Crick and Hoogsteen base pairing. The formation of triple helix structures requires a high degree of complementarity of the sequence of two of the strands involved to the third strand. In preferred triple helix structures two of the strands are composed of pyrimidine nucleobases of any sequence while the third strand is composed of the complementary purine nucleobase sequence. The triple helical structure therefore preferably has a length of at least six purine or six pyrimidine nucleobases respectively.

It has been shown in WO 95/01370 that peptide nucleic acids (PNAs) have the ability to form triplex structures with nucleic acids. Criteria for forming triple helices can therefore be taken from this patent application. PNAs and their synthesis are disclosed in WO 92/20702 and WO 94/25477. In one embodiment the backbone of PNAs is composed of repeating units of ethylaminoglycine moieties, wherein the nucleobases are bound to the glycine amino group. PNAs in

this definition therefore contain an amino terminus (-NH₂) and a carboxylic acid terminus (-COOH). These termini can be modified by the attachment of other moieties or the omission of groups (for example the linkage to groups increasing solubility, like lysine).

In Figure 2 there are shown four possible cases of intramolecular base pairing between a DNA and PNA part of one probe molecule. Prerequisite to Figure 2 is that the PNA and the DNA part are able to hybridize by base pairing. It becomes clear that the way of linking the PNA sequence to a DNA sequence as shown in Figures 2C and 2D is favored over the embodiments shown in Figures 2A and 2B. Case 2C and 2D are referred to as parallel binding. In case A the 5' terminus of the DNA (head) is bound to the carboxyl end of the PNA (tail). For forming triple helix structures, the antiparallel arrangement of the sequences should therefore be avoided, the parallel arrangement should be preferred.

In Figure 3 four cases for arranging the three strands of a hypothetical triple helix structure are shown. Again a prerequisite is an ability to hybridize by base pairing of the segments as pointed out above. For the present invention it has been shown that the arrangement according to case B and C should be avoided in order to receive stable triplex structures. Cases A and D are preferred. These cases may be realized by appropriately choosing the nucleobase sequence of the molecules involved.

A probe according to the invention is an entity used for binding a label of any kind to a molecule to be determined. This binding may be direct or indirect.

An assembly of the present invention is defined to contain at least one, preferably just one, molecule A and a multiplicity of different identical probe molecules, preferably more than 2 and most preferably between 10³ and 10⁷ probe molecules.

Each probe molecule B is defined to contain at least two segments. They are named in the following as B1 and B2. These segments are preferably and most practically linked together covalently, either directly or indirectly via a linker moiety. It will become apparent from the detailed description of the invention, that the linkage of the two segments must essentially fulfill the purpose to fix the arrangements/orientation of the segments within each probe molecule and to space the regions between B1 and B2. The linker moiety L therefore may have the function to provide a chemical entity for connecting the termini of the segments, but may further have the function to provide a defined distance between the segments to be linked. Linker moieties according to the invention are bivalent moieties of 1 to 100 atoms or more. Typical linker moieties are alkylene groups, dicarboxylic acid moieties, diamine moieties or amino acid moieties. Preferred distance is between 20 and 100 atoms, counted between the atoms following the first non-base atom of adjacent bases. One example of a probe molecule is shown in Figure 8. In this schematic presentation two PNA molecules, each having an amino and a carboxyl terminus are linked together by a linker moiety L, connecting two amino termini of the PNAs. Carboxylic acid termini of PNAs can for example be connected by the use of conventional condensing agents like diimides, for example 1-(3-dimethylaminopropyl)-3-ethyl carbodiimide (EDC). Rigid linkers are further advantageous to avoid intramolecular hybridization.

In case of a probe molecule containing a PNA and a DNA segment preferred linking moieties connect hydroxyl groups of the DNA segment with either of the amino or carboxyl end of the PNA segment (compare Figure 2). Molecules containing segments of nucleic acids and nucleic acid analogues are described in WO 95/08556 and WO 95/14706. These chimerical molecules can be used in the present invention as probe molecules. At least one of the segments of the probe molecule is capable of participating in a triple helix structure.

This segment is therefore preferably designed to consist of a sequence of nucleobases complementary to sequence SA of the molecule A.

By complementarity according to the invention there is meant more than 90% complementarity of a consecutive number of nucleobases of a length of at least nine bases. Complementarity is judged by hydrogen bonding between bases.

While segment B1 is designed for binding to molecule A, segment B2 is designed to minimize binding by base pairing to segment B1 of the same probe molecule (intramolecular binding). Therefore the arrangements of Figures 2C and 2D should be chosen. One further way to avoid intramolecular binding is by choosing a linker length, preferably small enough to sterically hinder such binding.

Conditions for formation of triple helical structures may vary dependent upon the kind of moieties making up sequence SA and segment B1. For PNAs and DNA the reaction conditions are described in WO 95/01370. These conditions can be applied for binding of molecule B to molecule A. Preferred these conditions include a pH less than 7, conferring protonation of cytosine molecules. For triple helical structures made up by other strands, a man skilled in the art can determine the optimal conditions for triplex formation by titration experiments or by comparing melting curves and association curves.

The triple helix structure formation reaction is allowed to proceed as long as required to form as much triple helices as intended which will generally be within 1 min. and 12 hours, preferably between 15 and 30 min. Generally, in a way to also estimate the amount of molecules A in the reaction mixture, for example in a quantitative assay, one would stop the reaction after a defined reaction time. Such stopping the reaction can be made by changing the pH such that no further triplex formation can occur. Therefore the pH is changed to more basic conditions, preferably to a pH of more

than 8

The formation of triple helices is determined using segment B2 bound to molecule A, as a measure for the presence, absence or amount of molecule A. There are many ways to determine segment B2, depending upon the molecular structure of this segment. In a first instance segment B2 can be determined using its sequence of nucleobases. This sequence makes possible the use of further probes comprising a nucleobase sequence complementary to the sequence of segment B2.

In one embodiment, determination of segment B2 is by a probe containing a sequence complementary to segment B2 and a reporter group. Reporter groups are generally known as moieties that are itself detectable or can be detected by coupling to a detectable moiety. Examples of reporter groups are fluorescent moieties, like fluorescein, and enzymes, for example, peroxidase, or immunologically active substances, like haptens, for example, digoxigenin or colored substances, like rhodamine, or vitamins, like biotin. This labeled probe will be termed secondary probe in the following. The secondary probes preferably do not contain a further nucleobase sequence complementary to a sequence contained in the reaction mixture and therefore are designed to stop the process of adding more probe molecules to molecule A.

The secondary probe can be added at any time to the reaction mixture or even to one of the reagents of the reaction. In a first embodiment, wherein the secondary probe is used as a blocker for the binding of further probe molecules, the secondary probe is added to the reaction mixture at the start of the incubation. The amount of secondary probe must be chosen such that it still allows enhancing the number of binding sites (for example B2) bound to molecule A, but also consecutive binding to a ratio of these binding sites. Therefore generally the amount of secondary probes will be less than the amount of probe molecules B. Secondary probes can further be used to control the level of amplification.

In a second embodiment the secondary probe is added to the reaction mixture after or before the incubation in order to stop the reaction. In this case the amount of the secondary probe is chosen such that it exceed the amount of free segments B2 likely be created during the incubation. This amount will depend upon the amount of molecules A contained in the mixture, the amount of probe molecules added to the mixture and the length of the incubation time.

The molecule A may then be determined via the label present in the secondary probe. This determination is performed analogous to the methods known in the art for these labels. The determination will preferably include calibration of the system by performing the identical reaction sequence for a reaction mixture containing known amounts of molecule A.

The present invention generally makes use of the idea that the formation of triple helix structures allows the formation of branched structures and thereby the formation of multiple sites for binding labels. The more probe molecules are assembled on one molecule A, the more binding sites are created. Using this principle there are various possibilities to assemble probes using the formation of triple helix structures, depending upon the nature of each of the two segments constituting the probe molecules. According to the invention it is possible to use only one kind of probe molecule, but it is also possible to combine different kinds of probe molecules. While the first approach will have the advantage that it is not necessary to synthesize probe molecules of different sequences the second approach may have the advantage of the possibility to better adapt the assembling reaction to specific requirements. In the following there will be described one embodiment of each approach.

In a first embodiment only one kind of probe molecule is used. This probe molecule therefore constitutes probe molecule B. In Figure 10 a schematic structure of an assembly formed during incubation of multiple probe molecules B with a molecule A is shown. In this embodiment segment B1 is a component participating twice in the formation of a triplex and B2 is a component participating only once in this triple helix structure. An example for component B1 is PNA, while B2 can then be DNA. The sequence and orientation of the segments is chosen according to the principles laid down in Figures 2 and 3. It will be recognized that the longer the incubation time is, the larger the assembly grows and the more binding sites useful for the determination for example segments B2 are available, for example for binding a labeled secondary probe.

In a second embodiment which also uses chimera of one segment capable of occurring twice in triple helix structure and one segment occurring once in a triple helix structure, two kinds of probe molecules are used. These probe molecules differ in structure such that the sequences of segments 1 and 2 of each kind of probe are chosen such that these segments cannot form triple helices with the other segment of the same kind of probe. However, the second segment B2 of the first probe molecule B is capable of participating in triple helix structure with the first segment C1 of the second probe C and the second segment C2 of the second probe C can form a triple helix structure with the first segment B1 of a further probe molecule B. During incubation of these probe molecules with molecule A an assembly will be formed that contains a branched structure wherein the probe molecules are incorporated in an alternating way. Such a structure is shown in Figure 5. Figure 5 in addition shows that secondary probes containing a segment complementary to one of segments B2 or C2 of the probe molecules B or C can be incorporated to put a label on the assembly when the secondary probe acts as a terminator of the assembly process. The secondary probe should then not contain another segment complementary to any other segment of probe molecules B and C. This is named by the term blocked

end. Figure 5 further shows the formation of triplexes of different orientation depending upon the sequence of the probe molecules.

As can be seen further, the segments preferably contain either purines or pyrimidines, such that one segment contains only purines, while the other contains only pyrimidines. This is preferred because highly stable triple helices form when pyrimidines of a PNA base pair to purines of a DNA using Watson/Crick binding and Hoogsteen binding.

The segments of the probe molecules can be synthesized independently, especially if the segments comprise different backbones. The synthesis of PNAs is described in WO 92/20702, whereas the synthesis of deoxyribonucleotides is possible according to a wide variety of methods, comprising chemical synthesis via phosphoramidites or, especially for longer sequences, by methods including enzymes, like in the template dependent synthesis or restriction of double stranded nucleic acids. In a subsequent step the two segments are connected by the linker moiety L. The linker can be any molecular unit, such as amino acid residues, e.g., aspartate or glutamate, or other compounds like 8-amino-dioxa-octanoic acid (Ado, according to DE-A-3943522) or hexamethylene.

In a third embodiment, which can involve both, duplex formation and triplex formation, there is used a first kind of probes containing first and second segments which occur twice in a triplex structure, whereas a second kind of probe molecules contains first and second segments that occur only once in triplex structures. In one example probe B contains two PNA segments and probe C contains two DNA segments. The sequence of segment C1 is such that it binds segment B2 and the sequence of segment C2 is chosen such that it binds sequence B1 of an additional molecule of probe B. Again, as outlined above, the sequences are chosen in sequence and symmetry such that the probes cannot bind intramolecularly and such that the overall sequence of probe B is not complementary to overall sequence of probe C. An assembly of those probes B and C leads to alternating assembly of the probes. The synthesis of such probes can be especially advantageous because they can be synthesized without interrupting automated chemical synthesis.

In case the assembly reaction involves four or more compounds (as in Figure 6B), some compounds (for example compounds B and C as well as D and E or B, C and D or C, D, and E) may be combined and reacted prior to the overall mixing. Thus the duplex- or triplex-hybridisations may be conducted separately. Alternatively, each compound may be added stepwise, each step being succeeded by a washing step.

As described above for the chimeric molecules, it is possible to construct assemblies with more probes. An example of such a construct is given in Figure 6B. In this case segment B2 of probe B is complementary to a segment C1 of probe C, segment C2 is complementary to a first segment D1 of a further kind of probe D, which in addition contains a segment D2 which is complementary to a first segment E1 of a further kind of probe molecule E, which in turn contains a segment E2 complementary to the sequence of segment B1. This assembly requires that for example segment C2 is not complementary to a segment B1 and D1 and segment C2 is not complementary to segment B1 and C1. In this way a controlled assembly of a multiplicity of probes using triple helix structures is possible.

The use of probe molecules containing only one kind of backbone in both segments has the advantage of easier synthesis of the probe molecules. The probe molecules can easily be synthesized totally from monomeric units without the need of a subsequent linkage step. If it is desired to use a linker connecting segments 1 and 2, or if an opposing orientation of the segments is chosen, it may be advantageous to synthesize the segments independently and connect them in a subsequent step as pointed out above.

A further subject of the invention is a molecule B containing a nucleobase sequence containing segments B1 and B2 wherein B1 contains a peptide bond containing backbone and B2 contains a natural backbone and wherein said segments are covalently bound together directly or through a linker moiety and wherein said binding is made between the amino terminus of B1 and the 3' terminus of B2 or the carboxylic acid terminus of B1 and the 5' terminus of B2. A peptide bond according to the invention is the chemical bond between a group CO and a group NR, wherein R is hydrogen or C₂-C₆ acyl or C₁-C₆ alkyl. A natural backbone contains sugar-phosphate units.

A further subject of the invention is a method for the determination of an analyte comprising providing a reaction mixture containing a nucleobase SA containing molecule A, said molecule being capable of forming a triple helix structure through said sequence and being capable of binding to said analyte multiple probe molecules B containing a first segment B1 capable of participating in a triple helix structure with A through said sequence SA and a second segment B2 incubating said reaction mixture at conditions allowing the formation of triple helices and determining the formation of triple helices using said segment B2 as a measure for the analyte to be determined. Preferably the molecule A is a probe present in the reaction mixture in an amount dependent upon the presence/absence or amount of said analyte. An analyte according to this method is any molecule desired to be determined. Typical analytes are constituents of body fluids, for example blood or fluids derived therefrom, like serum or plasma, or urine or sputum. Some fluids require preparational steps to bring the analytes into accessible form. For example could it be required to lyse cell walls in order to release analytes. The analytes can be for example antibodies, antigens, haptens or nucleic acids. Nucleic acids are preferred analytes. In order to obtain a flexible system for universal amplification it is preferred to use a primary probe comprising a first segment of nucleobases complementary to the sequence of a stretch of the analyte sequence and a second segment which contains a nucleobase sequence complementary to segment B1. In this system the probe molecules can be used for analytes having different nucleobase sequences. A construct formed is shown in Figure 6.

A further subject of the invention is the use of formation of multiple triple helix structures for the determination of an analyte.

A further subject of the invention is a composition of matter comprising a component N containing a sequence N1 capable of forming a triplex structure and a sequence N2 accessible for further hybridization and a component M containing a sequence M1 capable of forming a triplex structure including sequence N1 and a sequence M2 accessible for further hybridization. Examples of components N and M are molecule A and probe B or probe B and probe C. Those compositions of matter are intermediate products in the assembly of the above process. However, they can be used further to determine nucleic acids. An example of component O is probe D.

The following examples are given to exemplify the invention and determine conditions for successful conduction of the method:

General

The PNAs were synthesized according to WO 92/20702. If applicable, modifying groups are attached while the PNAs were still protected and on the solid phase. The PNAs had an amide function at the COOH end because of the choice of solid support and the subsequent way to decouple the PNA from the solid phase. Thus, in this case we denote the C-end with -CONH₂. The amino end is denoted -H. Monomers for synthesis of the PNAs were purchased from Millipore, USA. Oligonucleotides were synthesized chemically on an automated synthesizer.

Example 1

Analysis of conditions for triplex formation

In order to estimate the of triplex forming capability of oligos (for example PNAs or probes B and c) melting temperature T_m was measured at pH 4.5 and 9.5, since no Hoogsteen base pairing is possible at the higher pH. In total, 1 ml of a solution containing 0.1 M phosphate buffer at the desired pH. Nine μM PNA and 4.5 μM DNA was heated to 95°C for 10 min., and allowed to cool slowly at 22°C for 18 h. Subsequently, 2 ml 0.1 M phosphate buffer at the relevant pH was added, and the optical density was measured ramping the temperature from 25°C to 95°C at 0.5°C/min. As can be seen from Figure 12, T_m of segments B1 and C2 is 90°C at pH 4.5, and 58°C at pH 9.5. Such pH-dependency shows that Hoogsteen base pairing contributes significantly to the stability of the hybridisation complex, and that triplex formation has occurred.

The sequences of segments B1 (PNA) and C2 (DNA) are

B1: Ac-glu-Ado-TTCTTCTTT-CONH₂
C2: NH₂-(CH₂)₆-5'-AAAGAAGAAA-3' (SEQ.ID.NO.1)

Example 2

Synthesis of DNA-PNA chimera

A DNA oligo with a six-carbon atom (hexamethylene) linker and a terminal, was linked to a PNA oligo with glutamate residue at the amino terminus, i.e., the DNA oligo SIG1 with PNA187 and the DNA oligo SIG2 with PNA 184. The reaction mixture was as follows:

5 μl DMSO
2 μl EDC, 0.5 M
2 μl imidazole, 1 M
3.6 nmol PNA (PNA187 or PNA184)
3.6 nmol DNA (SIG1 or SIG2)
H₂O to 20 μl

where:

SIG1: 5' NH₂-(CH₂)₆-AAAGAAGAAA 3' (SEQ.ID.NO. 1)
SIG2: NH₂-(CH₂)₆-5'-AAGAGAAAAA-5' (SEQ.ID.NO. 2)
PNA187: Ac-Glu-Ado-TTCTTCTTT-CONH₂
PNA197: Ac-Glu-Ado- TTTTCTCTT-CONH₂
Ac means Acetyl

EP 0 857 791 A1

The reaction proceeded at 22°C for 1-5 days.

Chimera with the following sequences were produced:

NH₂CO - TTTCTTCTTT- AAGAGAAAAA-3'

NH₂CO - TTCTCTTTTT-AAAGAAGAAA-3'

The DNA was labelled with ³²P-ddATP by conventional enzymatic terminal elongation.

Example 3

Analysis of chimera by gel chromatography

After reaction, 30 µl was added 5 µl 80% formamide, heated to 95°C for 5 min., cooled on wet ice for 10 min., and applied a 12% denaturing polyacrylamide gel.

18 ml 20% gelmix
10.8ml 8% urea
1.2 ml 10 x TBE (0.9 M Tris-borate, 0.01 M EDTA)
300 µl APS (ammonium per sulphate)
10 µl TEMED (N,N,N',N'-tetramethylethylene diamine)

where 20% gelmix consists of 7 M urea, 90 mM tris-borate pH 8.3 and 0.67% bisacrylamid. Electrophoresis was performed for 60 min. at 400 V. After electrophoresis the gel was wrapped in polyethylene film, placed on TLC plate, subjected to UV light and photographed. A reaction product was observed with approximately half the migration rate the DNA oligos.

Example 4

Purification of chimera

After electrophoresis, a gel fragment containing the chimera was excised from the gel, washed in 1 ml TE Buffer for 5 min., subsequently placed into 200 µl TE pH 8.3, and extracted with vigorous shaking overnight at 55°C.

Example 5

Formation of assemblies for signal amplification

In order to show that complexes of DNA with PNA can be formed wherein both, a part of the DNA and a part of the PNA is accessible for binding further probe molecules, the following PNA and DNA molecules were incubated:

DA256: 5'-CGACTTCAGCATGACTCAAAGAAGAAA-3' (SEQ.ID.NO. 3)
DA262: 5'-ATGTGGACATTGTCATCAAGAAAAGAA-3' (SEQ.ID.NO. 4)
PNA380: Ac-Glu-TGACAATGTCCACAT-Ado-Glu-Ado-Glu-Ado-TTTCTTCTTT-Glu-NH₂
PNA414: Ac-Glu-GTCATGCTGAAGTCG-Ado-Glu-Ado-Glu-Ado-TTCTTTTCTT-Glu-NH₂
DA256*: DA256 labelled with ³²P-dATP and oligonucleotide kinase.

The results are shown in Fig 12.

Experiment 1:

This is just the preparation of a solution containing 1 pmol DA256* (see lane 1).

Experiment 2:

In this experiment 1 pmol DA256* and 10 pmol PNA414 were mixed in 10 µl water and incubated overnight (see lane 2).

Experiment 3:

In this experiment 1 pmol DA256* and 10 pmol PNA380 were incubated. This experiment yields a DNA having two PNAs bound via triplex formation. This is the first molecule that can be used as a probe in nucleic acid hybridisation assays, if the part of the DNA not participating in the triplex formation is complementary to a selected region of a target nucleic acid. Instead of one binding side, now two binding sites (the free accessible parts of the PNAs) have been created (see lane 3).

Experiment 4:

In this experiment two DNA molecules (1 pmol DA256* and 20 pmol DA262) are incubated together with 10 pmol PNA380. This experiment shows that the binding sides remaining on the PNA380 further react with DNA molecules of complementary sequence forming duplexes. This can be seen from lane 4 of Fig 12, wherein the complex formed as seen in lane 3 disappears in favour of higher molecular weight bands.

Experiment 5:

This experiment shows that also the DNA part of DA256 is accessible to hybridisation with a PNA molecule, forming a duplex. In this experiment 1 pmol DA256*, 5 pmol PNA414 and 10 pmol PNA380 are mixed and incubated overnight. In lane 5 of Fig 5 it can be seen that, compared to lane 3, there is formed a higher molecular weight complex, indicating additional duplex formation with PNA414.

Experiment 6:

In this experiment all four probes were mixed together to create very high molecular weight assemblies. 1 pmol DA256*, 9 pmol DA256, 10 pmol DA262, 10 pmol PNA380 and 10 pmol PNA414 are mixed and incubated overnight. As can be seen from lane 6 of Fig 13 high molecular weight structures have formed. This is the first indication that the binding sites of originally 1 probe is enhanced four times. The conditions for running the gel of Fig 12 is 12% polyacrylamid with the buffer of TAE pH 7.0.

Example 6Formation of an assembly having doubled binding sites

This experiment shows the formation of the complex containing a first probe (DA256) binding via triplex formation to further probes (PNA380), which bind via duplex formation one further probe (DA262) each. The sequences of the oligomers used are given in Example no. 6. The conditions are the following:

Samples 1-7 contain:

1 pmol DA 256*
9 pmol DA256
40 pmol PNA380
X pmol PNA 262 (X = 0; 1; 5; 10; 20; 40; 100)

Gel: 12 % Polyacrylamid
Buffer: TAE pH 7.0

The results are presented in Fig 13. The lanes correspond to the samples as given above. It can be seen with lower concentrations of DA262 there is formed predominant an assembly of DA256 and PNA380 having a higher molecular weight than DA256. With increasing amount of DA262 there is formed a higher molecular weight complex (especially lanes 6 and 7). In lane 7 the predominant product is the complex containing one triplex structure and two duplex structures.

SEQUENCE LISTING

5

(1) GENERAL INFORMATION:

10

(i) APPLICANT:

(A) NAME: Boehringer Mannheim GmbH

(B) STREET: Sandhofer Straße 116

(C) CITY: Germany

15

(E) COUNTRY: DE

(F) POSTAL CODE (ZIP): 68305

20

(ii) TITLE OF INVENTION: Method of analysis using signal amplification

25

(iii) NUMBER OF SEQUENCES: 4

(iv) COMPUTER READABLE FORM:

30

(A) MEDIUM TYPE: Floppy disk

(B) COMPUTER: IBM PC compatible

(C) OPERATING SYSTEM: PC-DOS/MS-DOS

35

(D) SOFTWARE: PatentIn Release #1.0, Version #1.30 (EPO)

(2) INFORMATION FOR SEQ ID NO: 1:

40

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 10 base pairs

(B) TYPE: nucleic acid

45

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

50

(ii) MOLECULE TYPE: other nucleic acid

(A) DESCRIPTION: /desc = "Oligodeoxyribonucleotide"

55

(ix) FEATURE:

(A) NAME/KEY: misc_feature

(B) LOCATION: 1

(D) OTHER INFORMATION: /note= "at the terminus aminohexyl alkylated amino group"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 1:

AAAGAAGAAA

10

(2) INFORMATION FOR SEQ ID NO: 2:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 10 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: other nucleic acid

(A) DESCRIPTION: /desc = "Oligodeoxyribonucleotide"

(ix) FEATURE:

(A) NAME/KEY: misc_feature

(B) LOCATION: 1

(D) OTHER INFORMATION: /note= "at the terminus aminohexyl alkylated amino group"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 2:

AAGAGAAAAA

10

(2) INFORMATION FOR SEQ ID NO: 3:

5

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 27 base pairs

10

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

15

(ii) MOLECULE TYPE: other nucleic acid

(A) DESCRIPTION: /desc = "Oligodeoxyribonucleotide"

20

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 3:

25

CGACTTCAGC ATGACTCAAA GAAGAAA

27

(2) INFORMATION FOR SEQ ID NO: 4:

30

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 27 base pairs

35

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

40

(ii) MOLECULE TYPE: other nucleic acid

(A) DESCRIPTION: /desc = "Oligodeoxyribonucleotide"

45

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 4:

50

ATGTGGACAT TGTCATCAAG AAAAGAA

27

55

Claims

1. A method of determining a molecule A containing a sequence SA of nucleobases, said molecule being capable of participating in a triple helical structure through said sequence SA comprising
 - providing a reaction mixture containing multiple probe molecules B containing a first segment B1 capable of participating in a triple helix structure with A through sequence SA and a segment B2,
 - incubating said reaction mixture at conditions allowing the formation of triple helices and
 - determining the formation of triple helices using said segment B2.
2. A method according to claim 1, characterized in that segment B2 is capable of participating in a triple helix structure.
3. A method according to claim 1, characterized in that segments B1 or/and B2 occur twice in said triple helix structure.
4. A method according to any of claims 1 to 3, characterized in that the determination of triple helices is made by means of a probe C containing
 - a first segment C1 which can bind to segment B2 and
 - a second segment C2
 - wherein either or both of C1 and C2 are capable of participating in a triple helix structure
 - and determining the formation of triple helices using segment C2.
5. A method according to claim 4, characterized in that segment C2 is capable of participating in a triple helix structure.
6. A method according to claim 4, characterized in that segments C1 and/or C2 occur twice in a triple helix structure.
7. A method according to any of the preceding claims, characterized in that one of segments B1 and B2 contains a nucleobase sequence on a non-natural backbone and the other contains a nucleobase sequence on a natural backbone.
8. A method according to any of claims 4 to 6, characterized in that B1 and B2 contain a nucleobase sequence on a non-natural backbone and C1 and C2 contain a nucleobase sequence on a natural backbone.
9. A method according to any of claims 1 to 3, characterized in that the formation of triple helices is made using a labeled probe C containing a nucleobase sequence complementary to B2.
10. A method according to any of claims 7 and 8, characterized in that the non-natural backbone is a peptide bond containing backbone.
11. A molecule containing nucleobase sequence containing segments B1 and B2, wherein B1 contains a peptide bond containing backbone and B2 contains a natural backbone, and wherein said segments are covalently bound together directly or through a linker moiety, and wherein said binding is between the amino terminus of B1 and the 5' terminus of B2 or the carboxylic acid terminus of B1 and the 3'-terminus of B2.
12. A method for the determination of an analyte comprising
 - providing a reaction mixture with a molecule A containing a nucleobase sequence SA, said molecule being capable of forming a triple helix structure through said sequence SA and further being capable of binding to said analyte and multiple probe molecules B containing
 - a first segment B1 capable of participating in a triple helix structure with A through said sequence SA and
 - a second segment B2
 - incubating said reaction mixture at conditions allowing the formation of triple helices and
 - determining the formation of triple helices using said segment B2 as a measure for the analyte to be deter-

mined.

13. A method according to claim 12, characterized in that the incubation is stopped at a predetermined time by changing the pH of the reaction mixture or by adding blocking molecules.

5

14. Use of the formation of multiple triple helix structures for the determination of an analyte.

15. A composition of matter comprising

10

- a component N containing a sequence N1 capable of forming a triplex structure and sequence N2 accessible for further hybridisation and
- a component M containing a sequence M1 capable of forming a triplex structure including sequence N1 and a sequence M2 accessible for further hybridisation.

15

16. A composition of matter according to claim 15 wherein sequence N2 does not bind via base pairing to sequence M2.

17. A composition of matter according to claim 15 containing one component N bound to two components M.

20

18. A composition of matter according to claim 17, wherein the sequences M2 of the components M differ in sequence.

19. A composition of matter of claim 15, further comprising a component O bound to component N or component M via sequence N2 or sequence M2.

25

20. A composition of matter according to claim 17, wherein the sequences of the components M are identical and each sequence M2 is bound to a further component O.

30

35

40

45

50

55

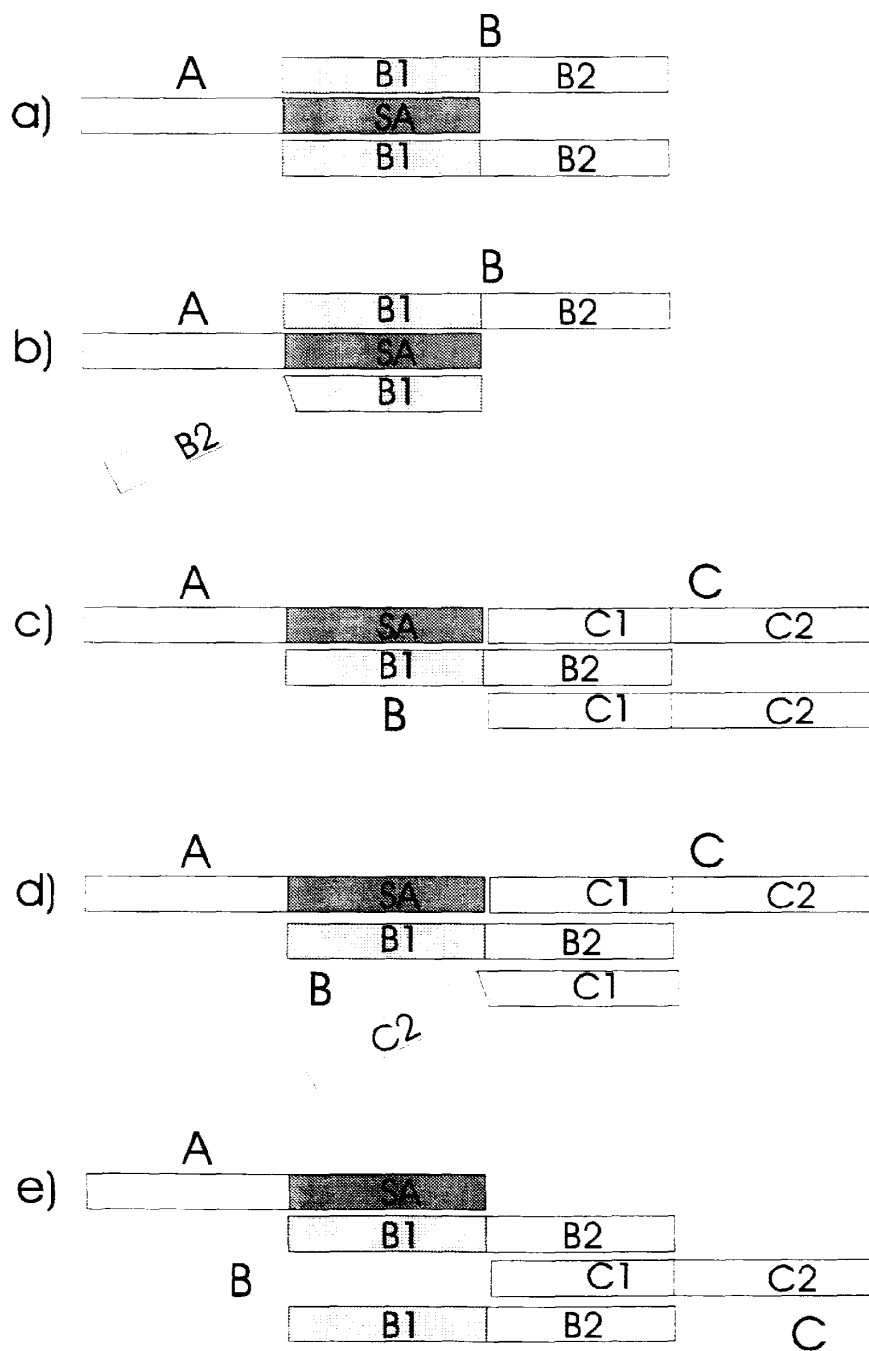


FIGURE 1A

FIG 1 B

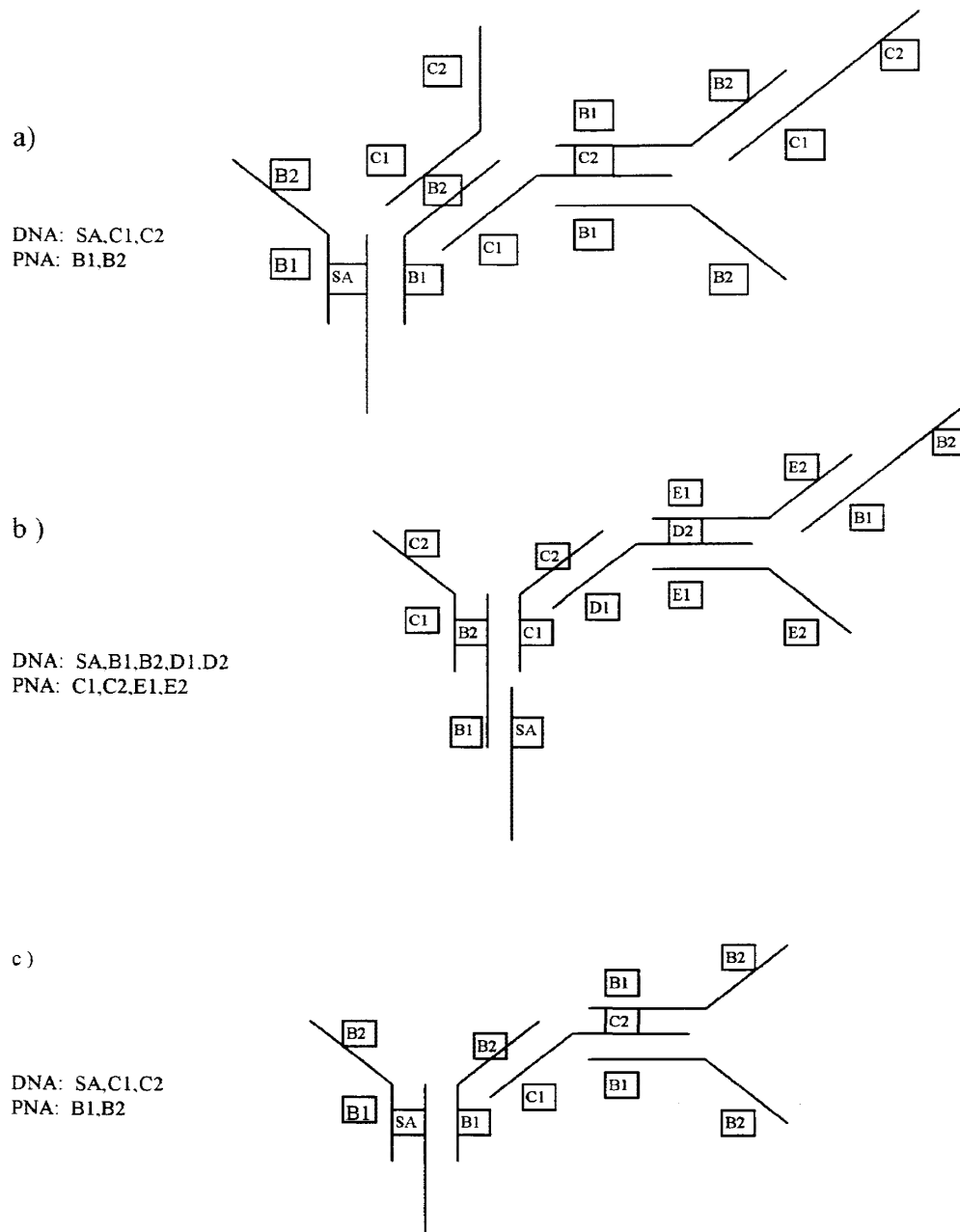
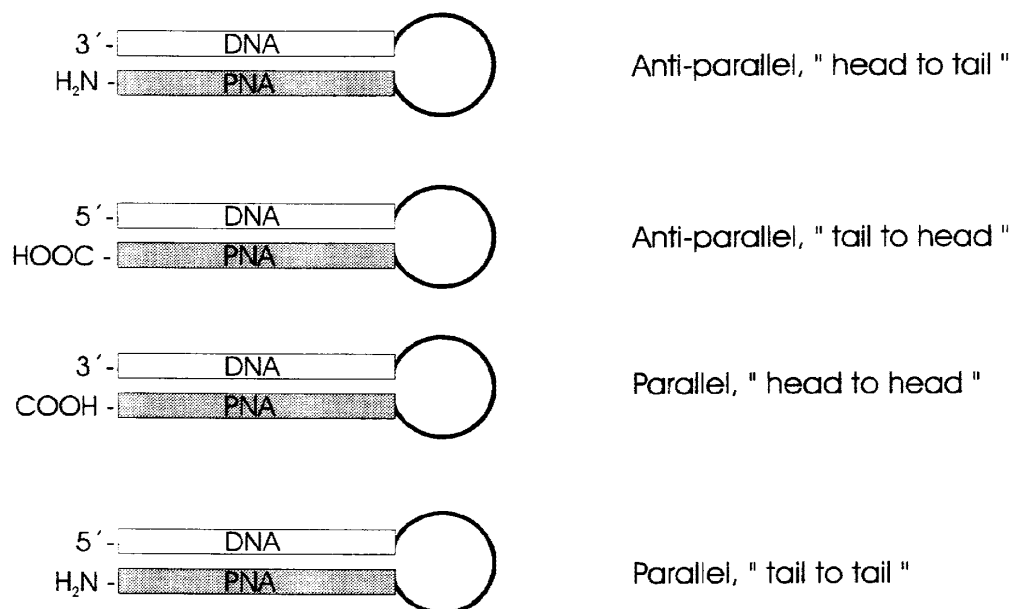


FIGURE 2



FIGURE 3



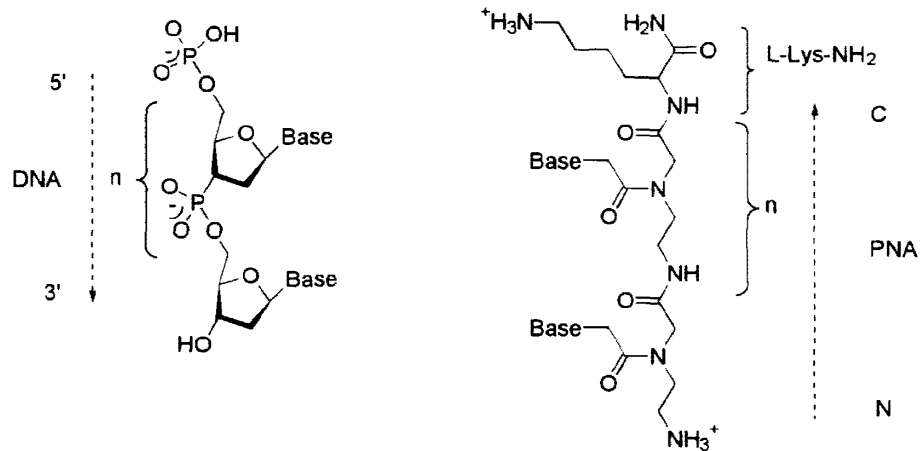


FIGURE 4

Fig. 5



FIGURE 6A

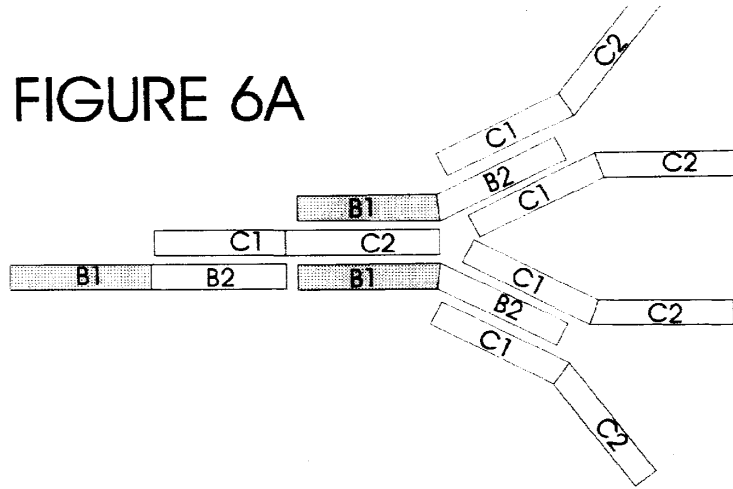


FIGURE 6B

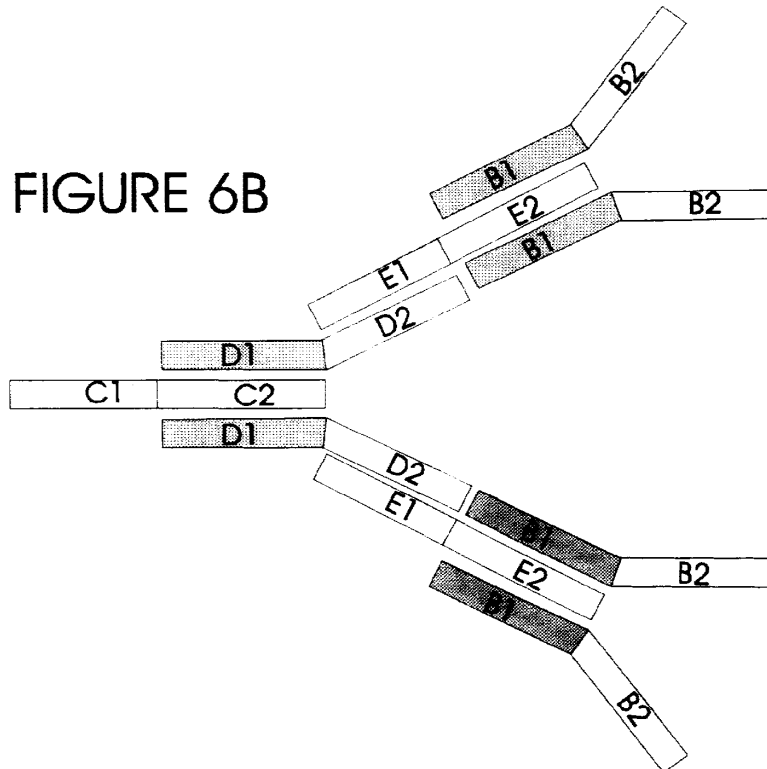


FIGURE 7

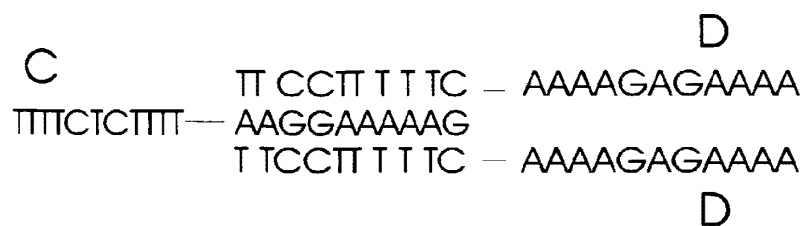


FIGURE 8



FIGURE 9

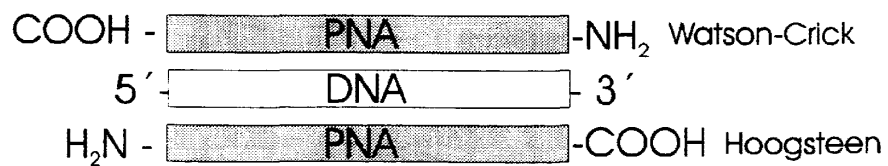


FIGURE 10

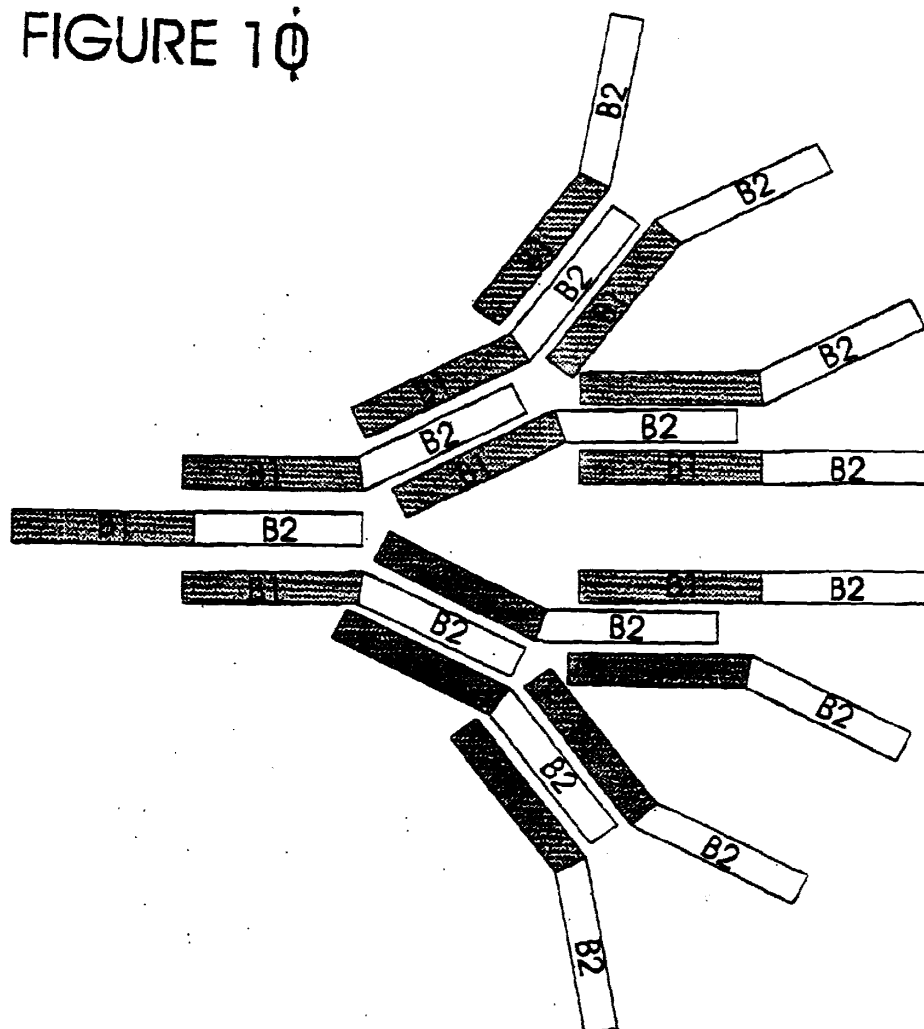


FIG 11

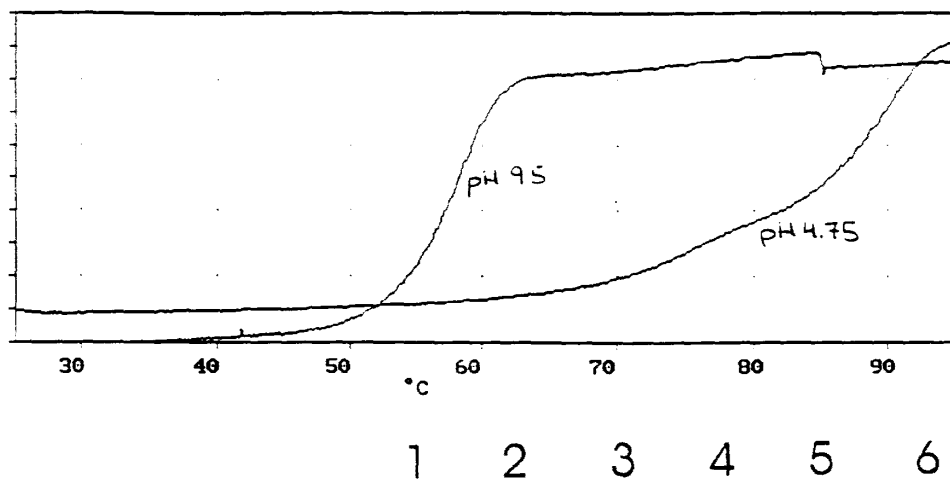


FIG 12

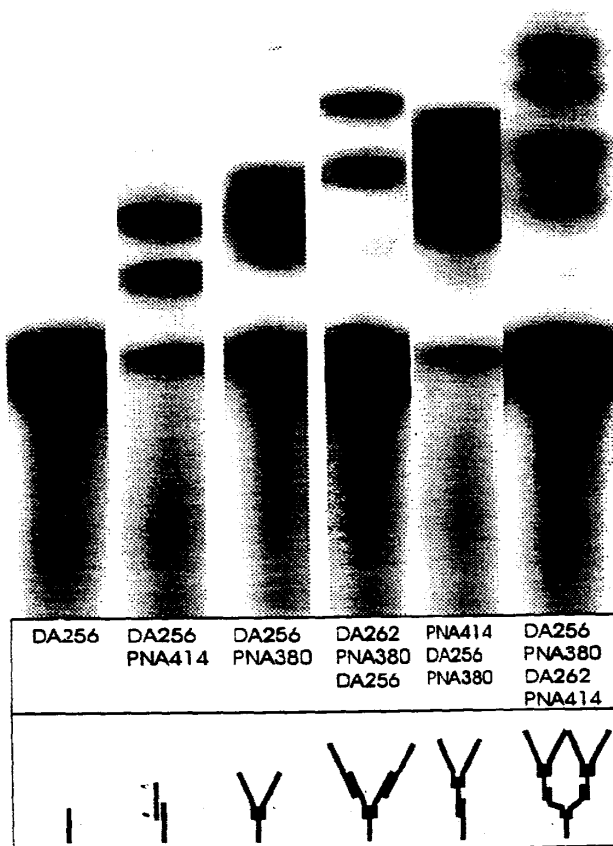
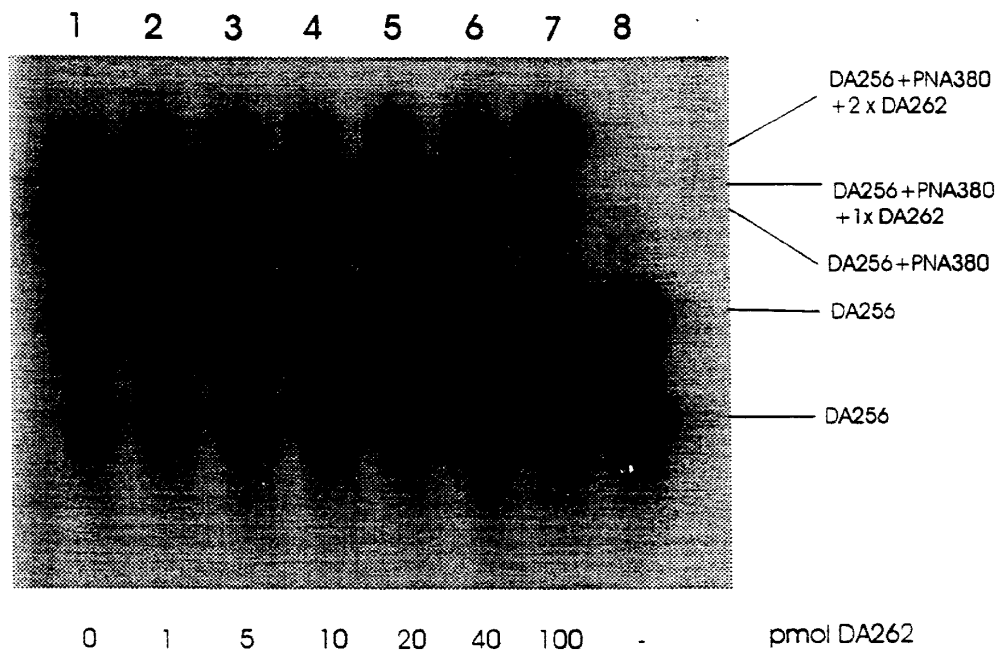


FIG 13





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 97 12 2253

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
D,X	WO 95 01370 A (ISIS PHARMACEUTICALS INC ;BUCHARDT OLE (DK); EGHOLM MICHAEL (DK);) * abstract * * page 7, line 1 - line 24 * * page 12, line 29 - page 13, line 2 * * page 20, line 16 - line 24 *	11,15-17	C12Q1/68
Y	* page 27, line 3 - line 25; examples 51,52 *	1-3,7,8, 10,12,14	
D,X	WO 95 14706 A (ISIS PHARMACEUTICALS INC) * the whole document *	11 1-3,7,8, 10,12,14	
X	WO 92 11390 A (IDEXX LAB INC) * the whole document *	15-17 1-3,7,8, 10,12,14	
Y	WO 95 20320 A (UNIV BOSTON ;UNIV MASSACHUSETTS MEDICAL (US)) * the whole document *	1,4,7,8, 10-14	
Y	IRO T ET AL: "SEQUENCE-SPECIFIC DNA PURIFICATION BY TRIPLEX AFFINITY CAPTURE" PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF USA, vol. 89, 1 January 1992, pages 495-498, XP002000128 * the whole document *	1,4,7,8, 10-14	TECHNICAL FIELDS SEARCHED (Int.Cl.6) C12Q
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 27 March 1998	Examiner Knehr, M
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503.03.82 (P4/C01)

Electronic Acknowledgement Receipt	
EFS ID:	8593361
Application Number:	11938359
International Application Number:	
Confirmation Number:	3820
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:	035718/384480
Receipt Date:	08-OCT-2010
Filing Date:	12-NOV-2007
Time Stamp:	17:20:37
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	Transmittal Letter	1895D4_384480_SupplDS.pdf	84782 d800efdaf6d906497964731f9378c3cddb421b63	no	1

Warnings:

Information:

2	Information Disclosure Statement (IDS) Filed (SB/08)	1895D4_384480_SupplIDS_144 9.pdf	111714 53668e5c941284c52e1c09adc62b5f7bbab 85d48	no	1
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
3	Foreign Reference	EP0857791A2.pdf	1070265 9ad8411e4c49ee51c54bed779ed0ca3a50e 6818e	no	25
Warnings:					
Information:					
4	NPL Documents	Buck.pdf	872932 2440400a98e420597dc913c947b9b95d268 48be0	no	9
Warnings:					
Information:					
5	NPL Documents	SequenceSearchReports.pdf	242007 378ab9d077e556b0c3996dc3dc7c2ca814 db43e	no	6
Warnings:					
Information:					
6	NPL Documents	Stratagene.pdf	806209 3b6122b77e14cce686f9bbe25023f9a5712 4e45d	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			3187909		
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. 035718/384480

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re:	Bing et al.	Confirmation No.:	3820
Appl. No.:	11/938,359	Art Unit:	1638
Filed:	November 12, 2007	Examiner:	Kubelik, Anne R.
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,

/david m. saravitz/

David M. Saravitz
Registration No. 55,593

Customer No. 29122
ALSTON & BIRD LLP
Bank of America Plaza
101 South Tryon Street, Suite 4000
Charlotte, NC 28280-4000
Tel Raleigh Office (919) 862-2200
Fax Raleigh Office (919) 862-2260

ELECTRONICALLY FILED USING THE EFS-WEB ELECTRONIC FILING SYSTEM OF THE UNITED STATES PATENT & TRADEMARK OFFICE ON October 8, 2010.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

29122 7590 01/10/2011

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: 01/10/2011

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/938,359	11/12/2007	James Wayne Bing	035718/384480	3820

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

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$300	\$0	\$1810	04/11/2011

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 SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

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 01/10/2011

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.
-----------------	-------------	----------------------	---------------------	------------------

11/938,359 11/12/2007 James Wayne Bing 035718/384480 3820

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

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$300	\$0	\$1810	04/11/2011

EXAMINER	ART UNIT	CLASS-SUBCLASS
KUBELIK, ANNE R	1638	800-320100

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 _____
- (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 3.111. 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)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

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.

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.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/938,359	11/12/2007	James Wayne Bing	035718/384480	3820
29122	7590	01/10/2011	EXAMINER	
ALSTON & BIRD LLP PIONEER HI-BRED INTERNATIONAL, INC. BANK OF AMERICA PLAZA 101 SOUTH TRYON STREET, SUITE 4000 CHARLOTTE, NC 28280-4000			KUBELIK, ANNE R	
			ART UNIT	PAPER NUMBER
			1638	
			DATE MAILED: 01/10/2011	

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 414 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 414 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.

Examiner's Comment

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 20 August 2010 has been entered.
2. The terminal disclaimer filed on 20 August 2010 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of 7,323,556 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Examiner's Amendment

3. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with David Saravitz on 21 December 2010.

IN THE CLAIMS:

The second claim numbered 9 is cancelled without prejudice.

Claim 16 (New). The plant of claim 5, wherein said plant is a seed.

REQUIREMENT OF ALLOWANCE UNDER 37 CFR §§ 1.801-1.809

4. The Deposit Statement filed 20 August 2010 is deemed in accordance with 37 CFR §§ 1.801-1.809. Therefore, no 35 USC § 112, first paragraph rejection has been maintained even though it is apparent that DAS-59122-7 seed is essential to the claimed invention and that the deposit is necessary for an adequate written description and enablement for the claimed invention.

Since the application is otherwise in condition for allowance except for the needed deposit of DAS-59122-7 seed and since the Office has received written assurance that an acceptable deposit will be made on or before payment of the issue fee, the Office is authorized to mail Applicant a Notice of Allowance and Issue Fee Due together with a requirement that the needed deposit be made within THREE (3) MONTHS of the mail date of this letter (see 37 CFR § 1.809(c)).

Under 37 CFR § 1.809(c)(d) an applicant is required to make a deposit of seed within three months after the mailing date of the Notice Of Allowance and Issue Fee Due. The period for satisfying this requirement is extendible under ' 1.136, however, failure to make the needed deposit of seeds of 925847 will result in abandonment of the application for failure to prosecute. The deposit statement in the specification, and all claims which refer to the instant seeds by name, must be amended to include the deposit accession number. In the instant application claim 1 must be amended to recite the deposit accession number. These amendments should be submitted before the payment of the issue fee as an Amendment After Allowance under 37 CFR § 1.312. If the amendment is received after the payment of the issue fee the same should be made under the provisions of 37 CFR § 1.312(a) and a petition filed under 37 CFR § 1.183 to waive the requirement of 37 CFR § 1.312 that the amendment be filed before or with payment of the issue fee, that is, it must be accompanied by a fee in accordance with 37 CFR § 1.17(i) and a petition which includes "a showing of good and sufficient reasons why the amendment is

Art Unit: 1638

necessary and was not earlier presented and why justice requires waiver of the rule". Finally, the statement of deposit in the specification shall contain:

- (1) The accession number for the deposit(s);
- (2) The date of the deposit(s);
- (3) A description of the deposited biological material sufficient to specifically identify and to permit examination; and
- (4) The name and address of the depository (see 37 CFR § 1.809(d)).

Conclusion

5. 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.

January 9, 2011

/Anne R Kubelik/
Primary Examiner, Art Unit 1638

<i>Search Notes</i> 	Application/Control No. 11938359	Applicant(s)/Patent Under Reexamination BING ET AL.
	Examiner Anne R Kubelik	Art Unit 1638

SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
STN	7/21/09	ark
EAST	7/21/09	ark
http://www.lifesci.sussex.ac.uk/home/Neil_Crickmore/Bt/index.html	7/21/09	ark
SEQ ID NO:19 and 20	5/17/10	ark

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner
	SEQ ID NO:19 and 20	9/28/10	ark

--	--

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	11/938,359
				Filing Date	November 12, 2007
				First Named Inventor	James Wayne Bing
				Art Unit	1638
Examiner Name	Kubelik, Anne R.				
Sheet	1	of	1	Attorney Docket Number	035718/384480

U. S. 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
	12	Database EMBL, "PUFTW67TB ZM_0.6_1.0_KB Zea mays genomic clone ZMMBTa0732K13, genomic surgery sequence," 2003, retrieved from EBI accession no. EM_PRO:CG069192.	
	13	LOWE, <i>et al.</i> , "A computer program for selection of oligonucleotide primers for polymerase chain reactions," <i>Nucleic Acid Research</i> , 1990, Vol. 18(7), pp. 1757-1761.	
	14	WHITELAW, <i>et al.</i> , GenBank Accession No. BZ739496, 2003.	
	15	ZAMBRYSKI, <i>et al.</i> , GenBank Accession No. TIP37TD2, 1996.	

Examiner Signature	/Anne Kubelik/	Date Considered	09/28/2010
--------------------	----------------	-----------------	------------

*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./



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
 Address: COMMISSIONER FOR PATENTS
 P.O. Box 1450
 Alexandria, Virginia 22313-1450
 www.uspto.gov

BIB DATA SHEET

CONFIRMATION NO. 3820

SERIAL NUMBER	FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.		
11/938,359	11/12/2007 RULE	800	1638	035718/384480		
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 11/237,222 09/28/2005 PAT 7,323,556 which claims benefit of 60/614,225 09/29/2004						
** FOREIGN APPLICATIONS *****						
** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** 03/11/2008						
Foreign Priority claimed ☐ Yes ☒ No 35 USC 119(a-d) conditions met ☐ Yes ☐ No Verified and Acknowledged <u>/ANNE R KUBELIK/</u> Examiner's Signature		☐ Met after Allowance Initials	STATE OR COUNTRY IA	SHEETS DRAWINGS 7	TOTAL CLAIMS 3	INDEPENDENT CLAIMS 1
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						
FILING FEE	FEES: Authority has been given in Paper		☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time)			

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	11/938,359
				Filing Date	November 12, 2007
				First Named Inventor	James Wayne Bing
				Art Unit	1638
Examiner Name	Kubelik, Anne R.				
Sheet	1	of	1	Attorney Docket Number	035718/384480

U. S. 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
	16	US-5,474,796	12-12-1995	Brennan	
	17	US-5,541,308	07-30-1996	Hogan et al.	
	18	US-6,232,063	05-15-2001	Beckmann et al.	
	19	US-6,458,584	10-01-2002	Mirzabekov et al.	
	20	US-6,825,400	11-30-2004	Behr et al.	
	21	US-7,112,721	09-26-2006	Fabijanski et al.	
	22	US-7,323,556	01-29-2008	Bing et al.	
	23	US-2002/0013960	01-31-2002	Behr et al.	
	24	US-2002/0102582	08-01-2002	Levine	
	25	US-2003/0198943	10-23-2003	Remacle et al.	
	26	US-2006/0141495	06-29-2006	Kunsheng	
	27	US-2008/0166725	07-10-2008	Bing et al.	
	28	US-2008/0166726	07-10-2008	Bing et al.	
	29	US-2008/0171334	07-17-2008	Bing et al.	
	30	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
	31	EP 0 857 791 A2	12-08-1998	Boehringer Mannheim GmbH		

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
	32	BUCK, <i>et al.</i> , "Design Strategies and Performance of Custom DNA Sequencing Primers," <i>BioTechniques</i> , 1999, Vol. 27, pp. 528-536	
	33	Sequence Search Reports, OM nucleic – nucleic search, 2009, pp. 1-6.	
	34	Stratagene Catalog, page 40, 1988.	

Examiner Signature	/Anne Kubelik/	Date Considered	12/17/2010
--------------------	----------------	-----------------	------------

*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./



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/938,359	11/12/2007	James Wayne Bing	035718/384480	3820
29122 7590 02/25/2011 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 1638	PAPER NUMBER
			MAIL DATE 02/25/2011	DELIVERY MODE 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. : 11938359
Applicant : Bing
Filing Date : 11/12/2007
Date Mailed : 02/25/2011

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 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

IDENTIFICATION OF DRAWING DEFICIENCIES

- ☐ There is a hole or the image thereof within the illustration. FIG(s)
- ☐ The illustration is penetrated or traversed by a solid or broken line that is not intended to be part of the drawing, such as a dark line caused by a flaw in the copying process. FIG(s)
- ☐ An ink stamp or the image thereof obscures part of the illustration. FIG(s)
- ☐ The drawing is marred by black smudges, obliterations, or fax/copier marks (for example, speckles or dots in a substantial portion of the drawing). FIG(s)
- ☐ Figure numbers are duplicated or missing. FIG(s)
- ☐ Drawing sheet or figure is missing. FIG(s)
- ☐ Numbers, letters, or reference characters in the drawing have been crossed out or are illegibly handwritten. FIG(s)
- ☐ The character of the lines, numbers, and letters is poor. FIG(s)
- ☐ The drawing's background shows that the original drawing was made on graph paper or other paper with a pattern or decoration. FIG(s)
- ☐ The FIG. number label is placed in a location that causes the drawing to be read upside down. FIG(s)
- ☐ Data, a reference number, or part of the drawing is truncated or missing, or a lead line has no reference number. FIG(s)
- ☒ The drawing is continued onto a second page (or more) without proper labeling under 37 CFR 1.84(u)(1). FIG(s) 1
- ☐ The drawing and/or the FIG. label contain(s) foreign language. FIG(s)
- ☐ A petition under 37 CFR 1.84(a)(2) to accept color drawings has been granted, but the brief description of the drawings in the specification does not contain (or has not been amended to contain) the paragraph required by 37 CFR 1.84(a)(2)(iv).
- ☐ OTHER:
- ☐ COMMENTS:

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	11/938,359
				Filing Date	November 12, 2007
				First Named Inventor	James Wayne Bing
				Art Unit	1638
Examiner Name	Kubelik, Anne R.				
Sheet	1	of	1	Attorney Docket Number	035718/384480

U. S. 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
	16	US-5,474,796	12-12-1995	Brennan	
	17	US-5,541,308	07-30-1996	Hogan et al.	
	18	US-6,232,063	05-15-2001	Beckmann et al.	
	19	US-6,458,584	10-01-2002	Mirzabekov et al.	
	20	US-6,825,400	11-30-2004	Behr et al.	
	21	US-7,112,721	09-26-2006	Fabijanski et al.	
	22	US-7,323,556	01-29-2008	Bing et al.	
	23	US-2002/0013960	01-31-2002	Behr et al.	
	24	US-2002/0102582	08-01-2002	Levine	
	25	US-2003/0198943	10-23-2003	Remacle et al.	
	26	US-2006/0141495	06-29-2006	~~Kunsheng~~ Wu	
	27	US-2008/0166725	07-10-2008	Bing et al.	
	28	US-2008/0166726	07-10-2008	Bing et al.	
	29	US-2008/0171334	07-17-2008	Bing et al.	
	30	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
	31	EP 0 857 791 A2	12-08-1998	Boehringer Mannheim GmbH		

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
	32	BUCK, <i>et al.</i> , "Design Strategies and Performance of Custom DNA Sequencing Primers," <i>BioTechniques</i> , 1999, Vol. 27, pp. 528-536	
	33	Sequence Search Reports, OM nucleic – nucleic search, 2009, pp. 1-6.	
	34	Stratagene Catalog, page 40, 1988.	

Examiner Signature	/Anne Kubelik/	Date Considered	12/17/2010
--------------------	----------------	-----------------	------------

*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

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No.:	11/938,359	Confirmation No.:	3820
Applicant(s):	Bing et al.	Date of Allowance:	January 10, 2011
Filed:	November 12, 2007		
Art Unit:	1638		
Examiner:	Kubelik, Anne R.		
Title:	CORN EVENT DAS-59122-7 AND METHODS FOR DETECTION THEREOF		

Docket No.: 035718/384480
Customer No.: 29122

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

**SUBMITTAL OF REPLACEMENT DRAWINGS UNDER 37 CFR § 1.85 (c)
RESPONSIVE TO NOTICE TO FILE CORRECTED APPLICATION PAPERS**

Sir:

In response to the requirement for replacement drawings as set forth in the Notice of Corrected Application Papers dated February 25, 2011, in the above-identified application, enclosed herewith are five (5) drawing sheets.

The Notice to File Corrected Application Papers states that Figure 1 continues onto a second page (or more) without proper labeling under 37 CFR § 1.84 (u)(1). Applicants respectfully submit that the replacement drawings filed herewith comply with this requirement. Any alterations made thereto have not introduced new matter; therefore their entry into the above-identified application is respectfully requested.

It is not believed that extensions of time are required. However, in the event that any such extensions of time are necessary to allow consideration of this paper, such extensions are

In re: Bing et al.
Appl. No.: 11/938,359
Filed: November 12, 2007
Page 2 of 2

hereby petitioned under 37 C.F.R. § 1.136(a), and any fee required therefor is hereby authorized to be charged to Deposit Account No. 16-0605.

Respectfully submitted,

/david m. saravitz/

David M. Saravitz
Registration No. 55,593

Customer No. 29122
ALSTON & BIRD LLP
Bank of America Plaza
101 South Tryon Street, Suite 4000
Charlotte, NC 28280-4000
Tel Research Triangle Area Office (919) 862-2200
Fax Research Triangle Area Office (919) 862-2260

ELECTRONICALLY FILED USING THE EFS-WEB ELECTRONIC FILING SYSTEM OF THE UNITED STATES PATENT & TRADEMARK OFFICE ON March 30, 2011.

REPLACEMENT SHEET

FIG. 1 (Sheet 1 of 5)

```

1      CTGAGCGCAC AACAGCGAGT CGCATGGCAC CGGACGACAT GAGCGAGATT
51     TAGATCGGAG GGTGCGGACA TGGGGCAACC TGCCGAGCTA ACCGACGGAT
101    CCACACGACC ACCAACGAAG CCAAGCCCGG GCACGTCCCC AGGCAGGTTG
151    GGCCCTGGTT CCACCAGCGG ATGCATGCAG TGAAGCGGGG ACGGAGAGAC
201    AAGCCGAGGG CGCGGGTGGG AATGGCGTCC GGGAGGACGA GTGGAGGAGA
251    AGAATCTAGA GGCATCGAGA TTCGAGAAGC CGACGGAGAC AAGATTCTGT
301    TGGGGGGGAGA CAAACCGCGG CGCTGAGCGC CGTTGATATG GGATCAGACG
351    GTGTGGATAA AAAAAGTGAC GTTGATAGAA CGTCTGGCCA GTGAAAAAAC
401    AAAACAACTC CAACAAAATA CTTTAAAAGC TCTTATACCC TAAATGTAGG
451    GGATCAAACA CGTCTCTACA CTATTTAGCA GCGTCCTCTA AATGATCCTC
501    TAAATTTAGA GAACGCTACT AGATTCTCTA TATATAGTTT CTCTAAACGA
551    TCTTTTATCC ATTTAAATAC TTTAAATAAC CGGTTTAAAC AAATAAAAT
601    ATATACAATA CATTTGAGAG TATGACAAAT ACGTATGTAT AAAAATAAAA
651    AATAAAATAA TGTATTAGTC TACTTTGAAT CTTCTTTTCT TCATAATATA
701    ATAGTGATAA GCTCTCATGT GCGTTGAGAA AAAAGTTAGA GCTAGACGTT
751    TAATGTGTAG TGACAGTCTT CGACGAAATC TCCCTAATGA GATGAATTAC
801    TGGAGGTTCC ATCAGAAAGT CCCCTGAAAA GAGGCATTTA TTTAGTTTAG
851    TCAGCAATTT CTGGGAACAC AAATATTCTT TTGTTATCAC CACTATTAAA
901    AATCTATGGT TATAACTTAT AATAACATGA AAAAATAATT TAGCATCCCA
951    TATATATAAA AACTGAAGGA AGCCATATAT ACTAACATAA GTTAGGAGAA
1001   ACTAAGAAGG TTGTGCAAAG CTTGCACTGC TCCAAAATAC TGCAAACAAC
1051   CACTCTCCTC TACCAACCAA AGAAACTCAT GTACTCCCTC CGTCTTTTTT
1101   TATTTGTGCG ATTTTAGTTT AAAAATGAAC TAGCAGTCGA CAAATATTCTG
1151   AGAACAGATA TAGTATATAC TAACATAACT TAGGAGATAC TAAGAAAGTT
1201   GCGCAGAGCT TTCACTGTC 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 TATATTATAC
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 GGATTTGTAA AAGATATGCC CAATCATICA TTTTAGTTAT
1701   FTATTTCTTA GTTATCCACT TGAAGATTTA CATACATTG AAATAAATT
1751   CTTAGAGGTA AAGTGAAAT CAGTTATTTA AATACATTTT AGTTATTTAT
1801   TTTCTTCTT TCCCTAATT TCCCTGTAT TTGAAGTCTG AAAAGATAAC
1851   TTTGCCCTTA TACATATTTT ATCTTCTACG TACGCATCTG AACAACGTCT
1901   CTTTGTCCCC TGATCGTGCA GCAATTAGTG CTATGAATCG CGTTTAAGCG
1951   CTGCAAAATC ATGGCTGGGG CTTGCTCCTC GAGTCGTCTT GCTGCTCGAT
2001   GTCACCTCGA GTCCCGCACC GACCTCAGTG CTTGTTCTTG TTGGAGCCAC
2051   CTCTCTCGGA CGATCGCCAA AGACGGATAA GGCCGAAGCC GTCACCTCAG
2101   ACCGCGCTCA TGCGCCGTAG CAGACTCCTA CATAGCAGGG CCAGGGTATG
2151   TGGACCTTTG CAAGTTTAGG ATTGGAACCA GCGACCAGAA TCCACAAGAT
2201   TGGAGCAAAC GACCAAAAT TCACAAGGAT TGGCGGCTGA CATTGCCAGC
2251   GCGGGATCGC ATGCGGCGGC GCGGCGCGG GCGAGCACGG GAGCAGGCCA
2301   CAGTCGAGCT CCATTGGAAC GTAGAAATAC TTAAGGGCAA GGTCTCCAAA
2351   TACTTGAAAA AATAGGAAAA AGAAGAAAT ACATGAATG ATATTGAAT
2401   CAATTGGAAG ATGTTATGAA TCTTGTTTTT GCAAAGCGAA CGATTGAGAT

```

REPLACEMENT SHEET

FIG. 1 (Sheet 2 of 5)

2451	GCCAAACTA	TGAATCTTT	TGTTTGAAGT	CCCAAATATA	AAATTTTCTC
2501	GTACTCACCA	ACATTGGTGC	GCACCTGTGA	TTGGCTCATA	AAAATTCFTG
2551	GAGGGACGGA	AGAAAGAGTG	AAGGGATAAG	CAAGTAAAAG	CGCTCAAACA
2601	CTGATAGTTT	AAACTGAAGG	CGGGAAACGA	CAATCTGATC	ATGAGCGGAG
2651	AATTAAGGGA	GTCACGTTAT	GACCCCGGCC	GATGACGCGG	GACAAGCCGT
2701	TTTACGTTTG	GAACGTACAG	AACCGCAACG	TTGAAGGAGC	CACTCAGCAA
2751	GCTTACTAGT	AGCGCTGTTT	AAACGCTCTT	CAACTGGAAG	AGCGGTTACC
2801	CGGACCGAAG	CTTGCATGCC	TGCAGTGCCG	CGTGACCCGG	TCGTGCCCCT
2851	CTCTAGAGAT	AATGAGCAT	GCATGTCTAA	GTTATAAAAA	ATTACCACAT
2901	ATTTTTTTTG	TCACACTTGT	TTGAAGTGCA	GTTTATCTAT	CTTTATACAT
2951	ATATTTAAAC	TTTACTCTAC	GAATAATATA	ATCTATAGTA	CTACAATAAT
3001	ATCAGTGTTT	TAGAGAATCA	TATAAATGAA	CAGTTAGACA	TGGTCTAAAG
3051	GACAAATGAG	TATTTTGACA	ACAGGACTCT	ACAGTTTTAT	CTTTTTAGTG
3101	TGCATGTGTT	CTCCTTTTTT	TTTGCAAATA	GCTTCACCTA	TATAATACTT
3151	CATCCATTTT	ATTAGTACAT	CCATTTAGGG	TTTAGGGTTA	ATGGTTTTTA
3201	TAGACTAATF	TTTTTAGTAC	ATCTATTTTA	TTCTATTTTA	GCCTCTAAAT
3251	TAAGAAACT	AAAACCTCTAT	TTTAGTTTTT	TTATTTAATA	ATTTAGATAT
3301	AAAATAGAAT	AAAATAAAGT	GACTAAAAAT	TAAACAAATA	CCCTTTAAGA
3351	AATTAAAAAA	ACTAAGGAAA	CATTTTCTCT	GTTTCGAGTA	GATAATGCCA
3401	GCCTGTAAAA	CGCCGTCGAC	GAGTCTAACG	GACACCAACC	AGCGAACCAG
3451	CAGCGTCGCG	TCGGGCCAAG	CGAAGCAGAC	GGCAGGCGAT	CTCTGTGCGT
3501	GCCTCTGGAC	CCCTCTCGAG	AGTTCCGCTC	CACCGTTGSA	CTTGCTCCCG
3551	TGTCGGCATC	CAGAAATTGC	GTGGCGGAGC	GGCAGACGTG	AGCCGGCACG
3601	GCAGGCGGCC	TCCTCCTCCT	CTCACGGCAC	CGGCAGCTAC	GGGGGATTCC
3651	TTTCCCACCG	CTCCTTCGCT	TTCCCTTCCT	CGCCCGCCGT	AATAAATAGA
3701	CACCCCTCC	ACACCCTCTT	TCCCAACCT	CGTGTTGTTC	GGAGCGCACA
3751	CACACACAAC	CAGATCTCCC	CCAAATCCAC	CCGTCCGCAC	CTCCGCTTCA
3801	AGGTACGCCG	CTCGTCCCTC	CCCCCCCCC	CTCTCTACCT	TCTCTAGATC
3851	GGCGTTCCGG	TCCATGGTTA	GGGCCCCGTA	GTTCTACTTC	TGTTCTGTTT
3901	TGTGTTAGAT	CCGTGTTTGT	GTTAGATCCG	TGCTGCTAGC	GTTCTGACAC
3951	GGATGCGACC	TGTACGTACG	ACACGTTCTG	ATTGCTAACT	TGCCAGTGTT
4001	TCTCTTTGGG	GAATCCTGGG	ATGGCTCTAG	CCGTTCCGCA	GACGGGATCG
4051	ATTTCAATGAT	TTTTTTTGT	TCGTTGCATA	GGGTTTGGTT	TGCCCTTTTC
4101	CTTTATTTCA	ATATATGCCG	TGCATTTGTT	TGTCGGGTCA	TCTTTTTCATG
4151	CTTTTTTTTG	TCTTGGTTGT	GATGATGTGG	TCTGGTTGGG	CGGTCGTTCT
4201	AGATCGGAGT	AGAATTCTGT	TTCAAACCTAC	CTGGTGGATT	TATTAATTTT
4251	GGATCTGTAT	GTGTGTGCCA	TACATATTCA	TAGTTACGAA	TTGAAGATGA
4301	TGGATGGAAA	TATCGATCTA	GGATAGGTAT	ACATGTTGAT	GCGGGTTTTA
4351	CTGATGCATA	TACAGAGATG	CTTTTTGTTC	GCTTGGTTGT	GATGATGTGG
4401	TGTGGTTGGG	CGGTGCTTCA	TTCGTTCTAG	ATCGGAGTAG	AATACTGTTT
4451	CAAACCTACCT	GGTGTATTTA	TTAATTTTGG	AACTGTATGT	GTGTGTCTATA
4501	CATCTTCATA	GTTACGAGTT	TAAGATGGAT	GGAAATATCG	ATGTAGGATA
4551	GGTATACATG	TTGATGTGGG	TTTTACTGAT	GCATATACAT	GATGGCATAT
4601	GCAGCATCTA	TTCAATGCT	CTAACCTTGA	GTACCTATCT	ATTATAATAA
4651	ACAAGTATGT	TTTATAATTA	TTTTGATCTT	GATATACTTG	GATGATGGCA
4701	TATGCAGCAG	CTATATGTGG	ATTTTTTTAG	CCCTGCCCTC	ATACGCTATT
4751	TATTTGCTTG	GTAATGTTTC	TTTTGTGCGAT	GCTCACCCCTG	TTGTTTGGTG
4801	TTACTTCTGC	AGGTGCACTC	TAGAGGATCC	ACACGACACC	ATGTCCGCCC
4851	GCGAGGTGCA	CATCGACGTG	AACAACAAGA	CCGGCCACAC	CCTCCAGCTG

REPLACEMENT SHEET

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	CCCGTTCCGC	GGCTCCAACA	AATACGACGG
5101	CCACTCCAAC	AAGTCCCAGT	ACGAGATCAT	CACCCAGGGC	GGCTCCGGCA
5151	ACCAGTCCCA	CGTGACCTAC	AOCATCCAGA	CCACCTCCTC	CCGCTACGGC
5201	CACAAGTCCT	GAGTCATGAG	TCATGAGTCA	GTTAACCTAG	ACTTGTCCAT
5251	CTTCTGGATT	GGCCAACCTA	ATTAATGTAT	GAAATAAAAG	GATGCACACA
5301	TAGTGACATG	CTAATCACTA	TAATGTGGGC	ATCAAAGTTG	TGTGTTATGT
5351	GTAATTACTA	GTTATCTGAA	TAAAAGAGAA	AGAGATCATC	CATATTTCTT
5401	ATCCTAAATG	AATGTCACGT	GTCTTTTATA	TTCTTTTGATG	AACCAGATGC
5451	ATTTTCATTAA	CCAAATCCAT	ATACATATAA	ATATTAATCA	TATATAATTA
5501	ATATCAATTG	GGTTAGCAAA	ACAAATCTAG	TCTAGGTGTG	TTTTGCGAAT
5551	GCGGCCGCGG	ACCGAATTGG	GGATCTGCAT	GAAAGAAACT	GTGCGACTGC
5601	TGAACCGCAC	CTTGTCACTT	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	GCAAGTGAAG	TTTGTGTTGG
5901	TTTAATTACC	CCTACGTTAG	TTGCGGGACA	GGAGACACAT	CATGAATTTA
5951	AAGGCGATGA	TGTCTCTCC	TGTAATGTTA	TTCTTTTGAT	GTGATGAATC
6001	AAAATGTCTAT	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	TATTGATTCTG	AAGATATATG	TTTCTTCTC
6351	CCACGGGCAC	CTAACGGATA	CATGATAAGG	CCAAGGCAGA	TCACGGGAAA
6401	TTATTGCAAT	ACATGTTACG	CCCTATTGCC	GGAAAAAAA	TGCAGGGCAG
6451	GTGTTGGCCG	TAGCGATTTA	AGCACTTAAG	CTGGAGGTTG	CCACACTTGG
6501	ATGCAAGCGT	CTGACCCTTC	TAAAACATCG	GCGGCTTTGT	CCGTATCCGT
6551	ATCCCCATC	CGACATCTAG	CTGGCCACAC	GACGGGGCTG	GGCAGATCGT
6601	GGATGCCGGG	TCGACGTCGA	TCGTACGCCA	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	CCCTACCTCT	CCCTCGACGA	CTCCGGCGTG	TCCCTCATGA	ACAAGAACGA
7001	CGACGACATC	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	CCTCGGCCCTC
7251	ATCCGCCCTCA	CCGACGAGTC	CTCCAACAAC	CCGAACCAGC	AATGGAACCT
7301	GACGTCCGTG	CAGACCATCC	AGCTCCCGCA	GAAGCCGATC	ATCGACACCA

REPLACEMENT SHEET

FIG. 1 (Sheet 4 of 5)

7351	AGCTCAAGGA	CTACCCGAAG	TACTCCCCGA	CCGGCAACAT	CGACAACGGC
7401	ACCTCCCCGC	AGCTCATGGG	CTGGACCCCT	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	GAAGTCCATC	GGCTTCCCTCA	CCATCACCTC	CCTGGAGCTC
7851	TACCGCTACA	ACGGCTCCGA	GATCCGCATC	ATGCAGATCC	AGACCTCCGA
7901	CAACGACACC	TACAACGTGA	CCTCCTACCC	GAACCACCAG	CAGGCCCTGC
7951	TGCTGCTGAC	CAACCACTCC	TACGAGGAGG	TGGAGGAGAT	CACCAACATC
8001	CCGAAGTCCA	CCCTCAAGAA	GCTCAAGAAG	TACTACTTCT	GAGTCATGAG
8051	TCATGAGTCA	GTTAACCTAG	ACTTGTCCAT	CTTCTGGATT	GGCCAACTTA
8101	ATTAATGTAT	GAAATAAAAG	GATGCACACA	TAGTGACATG	CTAATCACTA
8151	TAATGTGGGC	ATCAAAGTTG	TGTGTTATGT	GTAATTACTA	GTTATCTGAA
8201	TAAAAGAGAA	AGAGATCATC	CATATTTCTT	ATCCTAAATG	AATGTCACGT
8251	GTCTTTTATA	TTCTTTGATG	AACCAGATGC	ATTTTCAATTAA	CCAAATCCAT
8301	ATACATATAA	ATATTAATCA	TATATAATTA	ATATCAATTG	GGTTAGCAAA
8351	ACAAATCTAG	TCTAGGTGTG	TTTTGCGAAT	TCCCATGGAG	TCAAAGATTC
8401	AAATAGAGGA	CCTAACAGAA	CTCGCCGTAA	AGACTGGCGA	ACAGTTTATA
8451	CAGAGTCTCT	TACGACTCAA	TGACAAGAAG	AAAATCTTCG	TCAACATGGT
8501	GGAGCACGAC	ACGCTTGTCT	ACTCCAAAAA	TATCAAAGAT	ACAGTCTCAG
8551	AAGACCAAAG	GGCAATTGAG	ACTTTTCAAC	AAAGGGTAAT	ATCCGGAAAC
8601	CTCCTCGGAT	TCCATTGCCC	AGCTATCTGT	CACTTTATTTG	TGAAGATAGT
8651	GGAAAAGGAA	GGTGGCTCCT	ACAAATGCCA	TCATTGCGAT	AAAGGAAAAGG
8701	CCATCGTTGA	AGATGCCCTCT	GCCGACAGTG	GTCCCAAAGA	TGGACCCCCCA
8751	CCCACGAGGA	CCATCGTGGA	AAAAGAAGAC	GTTCCAACCA	CGTCTTCAAA
8801	GCAAGTGGAT	TGATGTGATA	TCTCCACTGA	CGTAAGGGAT	GACGCACAAT
8851	CCCACTATCC	TTGCGAAGAC	CCTTCTCTTA	TATAAGGAAG	TTTATTTCAT
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	ACCCTTGGET	GGTTGCTGAG	GTTGAGGGTG	TTGTGGCTGG	TATTGCTTAC
9151	GCTGGGCCCT	GGAAGGCTAG	GAACGCTTAC	GATTGGACAG	TTGAGAGTAC
9201	TGTTTACGTG	TCACATAGGC	ATCAAAGGTT	GGGCCTAGGA	TCCACATTGT
9251	ACACACATTT	GCTTAAGTCT	ATGGAGGCGC	AAGGTTTTTAA	GTCTGTGGTT
9301	GCTGTTATAG	GCCTTCCAAA	CGATCCATCT	GTTAGGTTGC	ATGAGGCTTT
9351	GGGATACACA	GCCCAGGGTA	CATTGCGCGC	AGCTGGATAC	AAGCATGGTG
9401	GATGGCATGA	TGTTGGTTTT	TGGCAAAGGG	ATTTTGAGTT	GCCAGCTCCT
9451	CCAAGGCCAG	TTAGGCCAGT	TACCCAGATC	TGAGTCGACC	TGCAGGCATG
9501	CCCGCTGAAA	TCACCAGTCT	CTCTCTACAA	ATCTATCTCT	CTCTATAATA
9551	ATGTGTGAGT	AGTTCCCAGA	TAAGGGGAAT	AGGGTTCTTA	TAGGGTTTTCG
9601	CTCATGTGTT	GAGCATATAA	GAAACCCCTTA	GTATGTATTT	GTATTTGTAA
9651	AATACTTCTA	TCAATAAAAT	TTCTAATTCC	TAAAACCAAA	ATCCAGGGCG
9701	AGCTCGGTAC	CCGGGGATCC	TCTAGAGTCC	ACCTGCAGGC	ATGCCCCGCG
9751	ATATCGATGG	GCCCCGGCCG	AAGCTTCGGT	CCGGGCCATC	GTGGCCTCTT

REPLACEMENT SHEET

FIG. 1 (Sheet 5 of 5)

```

9801 GCTCTTCAGG ATGAAGAGCT ATGTTTAAAC GTGCAAGCGC TCAATTCCGC
9851 CTATAGTGAG TCGTATTACA ATCGTACGCA ATTCAGTACA TTA AAAACGT
9901 CCGCAATGTG TTATTAAGTT GTCTAAGCGT CAATTTTICC CTTCTATGGT
9951 CCCGTTTGT TATCCTCTAA ATTATATAAT CCAGCTTAAA TAAGTTAAGA
10001 GACAAACAAA CAACACAGAT TATTAAATAG ATTATGTAAT CTAGATACCT
10051 AGATTATGTA ATCCATAAGT AGAATATCAG GTGCTTATAT AATCTATGAG
10101 CTCGATTATA TAATCTTAAA AGAAAACAAA CAGAGCCCCC ATAAAAAGGG
10151 GTCAAGTGGG CACTTGGTCA CTCATTTAAT CCCTCCCTCT CCTCTTTTAT
10201 CCCTCTTTT GGTGTATTCA CCAATAGTGG TGTGCACCTG TGATTGGCTC
10251 GTAAAAATTC TTGGACGGAT GGAAGAGTGA AGAGATAAGC AAGTCAAGA
10301 AAAGTAACAA CGAAGCTTCA TCAGCTACAA ATTTTGGCCC AACTGGTTGC
10351 ACCAGCACCA AACTTACGTA TACATGATTA TCTCTGTTT CCTCATTTTCG
10401 AAGAAAAAAA CGGGTTTCAA AACCCACTGC TTTCAGGAGT AAAAAAAGAT
10451 AATAATCTGA AACATTGCTT CCACCTTGGC CCTTATTTGG TTACGTTGCA
10501 ATTCACCCCA ATCCACATGT GGATTGAGAT GGATTGCAGT GTAGCTAGAC
10551 AAACCCCTAG GCCCTGTTTG CATAGGAATA CACCAGGAAT TATTCCAGCT
10601 AATCAAAATF TATATAAATG AGAGAAACAA TTCGGATAGG AATTGTTCCA
10651 GGACTTCATT CTGCAGTAAC CGAACGGCCC CTTAATCCAC CCCAATACAC
10701 GTGGATTGGA GTGGATTGAG GTACAGCCAA ACAAGGCCTA AGTGCAGATC
10751 AAATAAATCA CCCGTCAAT TCTTCTACCT ACAAAAACAG CAATAAACAC
10801 CTGAATGAAG TTCTAATTTG CACAGTGTAG GTAGGATGAA AATAGTTACC
10851 TTCTCATGGT CAGTAACTCT TGGCACACAA CTTACATGT AATCGATGTA
10901 CCACCTGGCT CTTGCCTGAA ACCCAATACA TCTTTAGCAT AAGAATAATA
10951 TTATGATGGC AAGGCATGAT CACCAGCACT CTTTATTGT TTAGTAAGTC
11001 TATCACTCCC CAAAACAATT CAAATGAACA GAGATGCATT GCCCCCAATG
11051 AATTCATATT CAATTAGCCG GAAAATPCTA CTTCAATCAGA AGCATCCAAA
11101 TTGCCAGCAT CCCTACTAGA CTGACCATGA CCAGGCCTGCC GCAGATGCCT
11151 CTTTTTCTGT CCTCTCCTCT TTGCCTTGAG TTTCTCTTCA AGATCCCTCA
11201 CCCACGTCT CTTATACATC TTAAAGCTAA CATGTCTCTC CTCGCCATC
11251 TTCCTAACCT TCTCAGTAAT CTCAGCAGCA ATCTGACGGT TGTACAACCT
11301 CTTCAGCCCC TTCATCAACT TTGCAATGT GTCAGGCTGT GGCATCAGTC
11351 CTGCCTCTAG CATGTCTAAG CAATACAGGC AGGCCTCCTT GACATGTTTC
11401 TTCGCAAACA GTGCATGAAT CCAGATAGTC CATGCACTCA CATTGAGCTC
11451 ACAGCCTTTG CTCACAATAC ATTTCCAAAC ATCCTTTGCA AGCTCAAGTT
11501 TCTCATCTCT GACCAACGCA TTGAGGAGGT CTTTCAGCAC CCCATATTGC
11551 GGTACCACAA AGAGCCCCCT CCCAACCATG TCTTTAAAT AACTACATGC
11601 CTCAATCAGC AAACCCCTGCC CAACAAGGCC ACTCACCACG ATAGCAAATG
11651 TATCGACCAC AGGACTGAGC CCAGCACTTT CCATCTCATT CCACAATGTC
11701 ATGGCTTGCT TGGTCTCCCC AAGCCTGCAG GCCAACCGAA TCACCACATT
11751 GTATATCTTG AGATCTGGTG GACACCGGCA CTCCCGCATC CTCTCCATCA
11801 GCTCCAAGCA CTCCTCAAGC TGCTCCTTCT TCTCGTGTGC TACAAAGAAA
11851 CCATGGTACA CGGCAGCGTC CACCCGCAGG CCATCCCTCG ACATAGCATC
11901 CAAGAACTCG TACCCCTGGG AT

```

Electronic Acknowledgement Receipt	
EFS ID:	9773469
Application Number:	11938359
International Application Number:	
Confirmation Number:	3820
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:	035718/384480
Receipt Date:	30-MAR-2011
Filing Date:	12-NOV-2007
Time Stamp:	15:33:41
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	Miscellaneous Incoming Letter	384480_transmittalletter.pdf	87762 39dfe93a37b5a4472a7335dfc64d421bcde d41f3	no	2

Warnings:

Information:

2	New or Additional Drawings	384480_replacementdrawings.pdf	2010007 72c5a2e54012127690555d29eac1f8116f5e1411	no	5
Warnings:					
The page size in the PDF is too large. The pages should be 8.5 x 11 or A4. If this PDF is submitted, the pages will be resized upon entry into the Image File Wrapper and may affect subsequent processing					
Information:					
Total Files Size (in bytes):			2097769		
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.					

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 01/10/2011

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.

ELECTRONICALLY FILED USING THE
EFS-WEB ELECTRONIC FILING
SYSTEM OF THE UNITED STATES
PATENT & TRADEMARK OFFICE ON

d with the United
ail in an envelope
r being facsimile
ted below.

(Depositor's name)

(Signature)

April 8, 2011

(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/938,359	11/12/2007	James Wayne Bing	035718/384480	3820

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

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$300	\$0	\$1810	04/11/2011

EXAMINER	ART UNIT	CLASS-SUBCLASS
KUBELIK, ANNE R	1638	800-320100

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 ALSTON & BIRD LLP

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. DUPONT DE NEMOURS AND COMPANY
DOW AGROSCIENCES 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. 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 16-0805 (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

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

David M. Saravitz

Date

4/8/2011

Typed or printed name

David M. Saravitz

Registration No.

55,593

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.

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

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No.:	11/938,359	Confirmation No.:	3820
Applicant(s):	Bing et al.	Date of Allowance:	January 10, 2011
Filed:	November 12, 2007		
Art Unit:	1638		
Examiner:	Kubelik, Anne R.		
Title:	CORN EVENT DAS-59122-7 AND METHODS FOR DETECTION THEREOF		

Docket No.: 035718/384480
Customer No.: 29122

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

AMENDMENT UNDER 37 C.F.R. § 1.312

Sir:

This Amendment is filed in response to the Notice of Allowance and the Examiner's Amendment mailed January 10, 2011.

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

A Listing of the Claims begins on page 4 of this paper.

Remarks begin on page 7 of this paper.

An **Appendix** is attached immediately following page 8 of this paper.

In re: Bing *et al.*
Appl. No.: 11/938,359
Filed: November 12, 2007
Page 2 of 8

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. 11/237,222 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 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

In re: Bing *et al.*
Appl. No.: 11/938,359
Filed: November 12, 2007
Page 3 of 8

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 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.).

Listing of the Claims:

1. (Cancelled)

2. (Previously presented) A corn plant comprising in its genome a DNA construct linked to at least one flanking region, wherein:

(a) said flanking region comprises a nucleotide sequence selected from the group consisting of the nucleotide sequence set forth in SEQ ID NO: 19 and the nucleotide sequence set forth in SEQ ID NO: 20;

(b) said DNA construct comprises a first, a second, and a third expression cassette;

(c) said first expression cassette comprises in operable linkage

(i) a maize ubiquitin promoter,

(ii) a 5' untranslated exon of a maize ubiquitin gene,

(iii) a maize ubiquitin first intron,

(iv) a Cry34Abl encoding DNA molecule, and

(v) a PinII transcriptional terminator;

(d) said second expression cassette comprises in operable linkage

(vi) a wheat peroxidase promoter,

(vii) a Cry35Abl encoding DNA molecule, and

(viii) a PinII transcriptional terminator; and

(e) said third expression cassette comprises in operable linkage

(ix) a cauliflower mosaic virus (CaMV) 35S promoter;

(x) a pat encoding DNA molecule; and

(xi) a 3' transcriptional terminator from CaMV 35S.

3. (Cancelled)

4. (Previously presented) The plant of claim 2, wherein said DNA construct comprises the nucleotide sequence set forth in SEQ ID NO: 24.

5. (Previously presented) The plant of claim 2, wherein said DNA construct is linked to a first and a second flanking region.

6. (Previously presented) The plant of claim 5, wherein said first flanking region comprises the nucleotide sequence set forth in SEQ ID NO: 19 and said second flanking region comprises the nucleotide sequence set forth in SEQ ID NO: 20.

7. (Previously presented) The plant of claim 6, wherein said DNA construct comprises the nucleotide sequence set forth in SEQ ID NO: 24.

8. (Previously presented) The plant of claim 2, wherein said plant is a seed.

9. (Previously presented) The plant of claim 4, wherein said plant is a seed.

9. (Cancelled)

10. (Previously presented) The plant of claim 6, wherein said plant is a seed.

11. (Previously presented) The plant of claim 7, wherein said plant is a seed.

12. (Previously presented) A plant comprising in its genome the nucleotide sequence set forth in SEQ ID NO: 23.

13. (Previously presented) The plant of claim 12, wherein said plant is a corn plant.

In re: Bing *et al.*
Appl. No.: 11/938,359
Filed: November 12, 2007
Page 6 of 8

14. (Previously presented) A seed comprising in its genome the nucleotide sequence set forth in SEQ ID NO: 23.

15. (Previously presented) The seed of claim 14, wherein said seed is a corn seed.

16. (Previously presented) The plant of claim 5, wherein said plant is a seed.

In re: Bing *et al.*
Appl. No.: 11/938,359
Filed: November 12, 2007
Page 7 of 8

REMARKS

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

Applicants propose to 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 1. This period is an obvious typographical error. The proposed amendments to the first paragraph on page 1 are purely formal in nature and thus require no substantial amount of additional work on the part of the USPTO. Applicants regret not presenting these amendments to page 1 earlier but only realized after the issuance of the Notice of Allowance that the Cross-Reference to Related Applications section needed to be updated and amended as set forth herein.

Applicants further propose to 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 as set forth in page 4 of the Notice of Allowability. This proposed amendment to the specification is responsive to the final Office Action of July 9, 2010, is needed for proper disclosure and protection of the invention, and requires no substantial amount of additional work on the part of the USPTO. Applicants did not make this amendment to the specification prior to the issuance of the last Office Action because the biological deposit was not made until after Applicants submitted a response to the last 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.

A listing of the claims is provided herewith that includes the amendments made in the Examiner's Amendment that accompanied the Notice of Allowability. Applicants do not propose herein to amend any of the claims.

In re: Bing *et al.*
Appl. No.: 11/938,359
Filed: November 12, 2007
Page 8 of 8

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 therefore (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

Customer No. 29122
ALSTON & BIRD LLP
Bank of America Plaza
101 South Tryon Street, Suite 4000
Charlotte, NC 28280-4000
Tel Research Triangle Area Office (919) 862-2200
Fax Research Triangle Area Office (919) 862-2260

ELECTRONICALLY FILED USING THE EFS-WEB ELECTRONIC FILING SYSTEM OF THE UNITED STATES PATENT & TRADEMARK OFFICE ON April 8, 2011.

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=PLS Department,
email=lramakrishnan@atcc.org, c=US
Date: 2010.10.20 14:33:15 -04'00'

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

Electronic Patent Application Fee Transmittal				
Application Number:		11938359		
Filing Date:		12-Nov-2007		
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/Chianti Lloyd		
Attorney Docket Number:		035718/384480		
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:				
Utility Appl issue fee	1501	1	1510	1510
Publ. Fee- early, voluntary, or normal	1504	1	300	300

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				1810

Electronic Acknowledgement Receipt	
EFS ID:	9837580
Application Number:	11938359
International Application Number:	
Confirmation Number:	3820
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:	035718/384480
Receipt Date:	08-APR-2011
Filing Date:	12-NOV-2007
Time Stamp:	09:47:56
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	\$1810
RAM confirmation Number	9470
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	Issue Fee Payment (PTO-85B)	1895D4_64003_384480_Issue_Fee_Transmittal.PDF	68796 98d99260651b185faeae9f8b5ff9e5819edbf5	no	1
Warnings:					
Information:					
2		1895D4_64003_384480_312_Amendment.PDF	217076 38788adbff2cebedbc781074fcd334280a3e91cc	yes	11
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Amendment after Notice of Allowance (Rule 312)		1	1	
	Specification		2	3	
	Amendment Copy Claims/Response to Suggested Claims		4	6	
	Applicant Arguments/Remarks Made in an Amendment		7	11	
Warnings:					
Information:					
3	Fee Worksheet (PTO-875)	fee-info.pdf	32112 7ce6a70c0ad7fc4a6ada18d7bfd3006ca5421eb1	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			317984		

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.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/938,359	11/12/2007	James Wayne Bing	035718/384480	3820
29122 7590 04/12/2011 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 1638	PAPER NUMBER
			MAIL DATE 04/12/2011	DELIVERY MODE 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.

Response to Rule 312 Communication

Application No.

11/938,359

Examiner

Applicant(s)

BING ET AL.

Art Unit

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

1. ☒ The amendment filed on 08 April 2011 under 37 CFR 1.312 has been considered, and has been:

a) ☒ entered.

b) ☐ entered as directed to matters of form not affecting the scope of the invention.

c) ☐ disapproved because the amendment was filed after the payment of the issue fee.

Any amendment filed after the date the issue fee is paid must be accompanied by a petition under 37 CFR 1.313(c)(1) and the required fee to withdraw the application from issue.

d) ☐ disapproved. See explanation below.

e) ☐ entered in part. See explanation below.



Publishing Division



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/938,359	06/07/2011	7956246	035718/384480	3820

29122 7590 05/18/2011
ALSTON & BIRD LLP
PIONEER HI-BRED INTERNATIONAL, INC.
BANK OF AMERICA PLAZA
101 SOUTH TRYON STREET, SUITE 4000
CHARLOTTE, NC 28280-4000

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 344 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):

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;