

Biosafety Clearing-House (BCH)

LIVING MODIFIED ORGANISM (LMO)


BCH-LMO-SCBD-14841-13

[? Decisions on the LMO ? Risk Assessments](#)

LAST UPDATED: 08 FEB 2019

Living Modified Organism identity


The image below identifies the LMO through its unique identifier, trade name and a link to this page of the BCH. Click on it to download a larger image on your computer. For help on how to use it go to the LMO quick-links page.



DAS-Ø15Ø7-1
Herculex™ I maize

CBD

<https://bch.cbd.int/database/record?documentID=14841>



Read barcode or type above URL into internet browser to access information on this LMO in the Biosafety Clearing-House © SCBD 2012

Name

Herculex™ I maize

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Transformation event

TC1507

Unique identifier

DAS-Ø15Ø7-1

Developer(s)

- [ORGANIZATION: DOW AGROSCIENCES](#) | [BCH-CON-SCBD-14939-1](#)

ORGANIZATION

Dow AgroSciences

Website: <http://www.dowagro.com/homepage/index.htm>

- [ORGANIZATION: PIONEER HI-BRED INTERNATIONAL INC.](#) | [BCH-CON-SCBD-14931-2](#)

ORGANIZATION

Pioneer Hi-Bred International Inc.

Private sector (business and industry)

7100 NW 62nd Avenue PO Box 1000

Johnston, Iowa

50131, United States of America

Phone: +1 515 535-3200

Website: www.pioneer.com/

Description

Corn modified with the insertion of the Cry1F gene from *Bacillus thuringiensis* to confer resistance to the European corn borer (*Ostrinia nubilalis*). A transformation cassette coding for phosphinothricin (PPT) herbicide tolerance, specifically glufosinate ammonium, was also inserted into the organism.

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Recipient Organism or Parental Organisms

The term “Recipient organism” refers to an organism (either already modified or non-modified) that was subjected to genetic modification, whereas “Parental organisms” refers to those that were involved in cross breeding or cell fusion.

[BCH-ORGA-SCBD-246-6](#) ORGANISM | ZEA MAYS (MAIZE, CORN, MAIZE) |

Crops

Characteristics of the modification process

Vector

PHI8999A derived from plasmid PHP8999

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Techniques used for the modification

Biolistic / Particle gun

Genetic elements construct

[P-ubi1-MAIZE](#)
0.980 kb

[I-1_ubi1-MAIZE](#)
1.000 kb

[CS-cry1F-BACTU](#)
1.820 kb

[T-orf25-RHIRD](#)
0.720 kb

[P-35S-CaMV](#)
0.550 kb

[CS-pat-STRVR](#)
0.550 kb

[T-35S-CaMV](#)
0.200 kb

Introduced or modified genetic element(s)

Some of these genetic elements may be present as fragments or truncated forms. Please see notes below, where applicable.

[BCH-GENE-SCBD-14987-8](#) CRY1F | BACILLUS THURINGIENSIS - BT, BACILLUS, BACTU |

Protein coding sequence | Resistance to diseases and pests (Insects, Lepidoptera (butterflies and moths))

[BCH-GENE-SCBD-15002-4](#) PHOSPHINOTHRICIN N-ACETYLTRANSFERASE GENE |

Protein coding sequence | Resistance to herbicides (Glufosinate)

[BCH-GENE-SCBD-100362-7](#) UBIQUITIN GENE PROMOTER | (MAIZE, CORN) |

Promoter

[BCH-GENE-SCBD-100363-5](#) ORF25 POLYA TERMINATOR SEQUENCE |

Terminator

[BCH-GENE-SCBD-100287-7](#) CAMV 35S PROMOTER |

Promoter

[BCH-GENE-SCBD-100290-6](#) CAMV 35S TERMINATOR |

Terminator

[BCH-GENE-SCBD-103627-5](#) UBIQUITIN INTRON 1 | (MAIZE, CORN) |

Notes regarding the genetic elements present in this LMO

Notes about the Other(s) sequence(s) specific to this LMO

DNA fragment PHI8999A contains two adjacent plant gene expression cassettes for the *cry1F* and *pat* genes (see below). Transcription of the *cry1F* gene was directed by the promoter and first exon and intron of the maize ubiquitin gene. The 3' terminator sequence used was the 3' polyadenylation signal from ORF25 (*Agrobacterium tumefaciens*) (see footnote*).

Transcriptional regulation of the *pat* gene from *Streptomyces viridochromogenes* was via promoter and terminator sequences derived from the 35S transcript of cauliflower mosaic virus (CaMV). The coding sequence of both genes has been optimised to achieve a high level of expression in maize.

The sequences of the complete *cry1F* and *pat* genes are identical to those in the original plasmid. The proteins produced in the modified plants are the ones intended, including a leucine residue (replacing a phenylalanine) at position 604 (of 605 amino acids in total) of Cry1F. This modification was introduced to create a specific restriction site for cloning purposes.

Footnote *: The EFSA document (see below) indicates that the 3' sequence from the *Agrobacterium tumefaciens* mannopine synthase gene was used as terminator of the *cry1F* gene.

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LMO characteristics

Modified traits

Resistance to diseases and pests

Insects

Lepidoptera (butterflies and moths)

Resistance to herbicides

Glufosinate

Common use(s) of the LMO

Food

Feed

Biofuel

Detection method(s)

External link(s)

? [DAS-Ø15Ø7-1 - EU Reference Laboratory for GM Food and Feed \(EURL-GMFF\)](#) (English)

? [DAS-Ø15Ø7-1 - CropLife International Detection Methods Database](#) (English)

Additional Information

Molecular analyses of the transformed plant show that the event TC1507 contains one site of integration of the introduced DNA which includes a full-length of the DNA fragment used for transformation (i.e. the ~6235 bp of DNA cassette containing the *cry1F* and *pat* genes) and an additional copy of the *cry1F* gene lacking the majority of the associated ubiquitin regulatory sequences.

Southern analysis using a *cry1F* probe carried out by the European Food Safety Authority (EFSA; see document below) revealed the presence of two *cry1F* inserts. The first represented the intact gene from the expression cassette. The second insert was a truncated *cry1F* fragment of 335bp, which is located at the 5' end of the insertion locus. In addition, analysis of the sequences adjacent to the insert of fragment PHI8999A revealed DNA fragments that correspond to small segments from PHI8999A, including incomplete sequences from the *pat* gene, the maize ubiquitin promoter and the terminator from *Agrobacterium*. Furthermore, different fragments of chloroplast DNA and a number of sequences with similarity to retrotransposons are also present in the border region of the insert.

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Additional Information

Other relevant website addresses and/or attached documents

? [CERA GM Database](#) (English)

? [OECD Biotrack Product Database](#) (English)

? [BATS \(2003\) Genetically Modified \(GM\) Crops: molecular and regulatory details, v.2.pdf](#) (English)

? [EFSA \(2005\) Opinion of the Scientific Panel on Genetically Modified Organisms on an application \(reference EFSA-GMO-NL-2004-02\) for the placing on the market of insect-tolerant genetically modified maize 1507...](#) (English)

? [DAS-Ø15Ø7-1 - Dow.pdf](#) (English)

[BCH-LMO-SCBD-14841-13](#)

Further Information

Questions about the Cartagena Protocol on Biosafety or the operation of the Biosafety Clearing-House may be directed to the Secretariat of the Convention on Biological Diversity.

**Secretariat of the Convention
on Biological Diversity**

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