

Biosafety Clearing-House (BCH)

LIVING MODIFIED ORGANISM (LMO)


BCH-LMO-SCBD-115718-1

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

LAST UPDATED: 10 SEP 2020


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.



MON-87427-7 × MON-ØØ81Ø-6
Herbicide tolerant, insect resistant maize

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

<https://bch.cbd.int/database/record?documentID=115718>


Name

Herbicide tolerant, insect resistant maize

EN

Transformation event

MON87427 × MON810

Unique identifier

MON-87427-7 × MON-ØØ81Ø-6

Developer(s)

- **ORGANIZATION:** BAYER CROPSCIENCE | [BCH-CON-SCBD-7088-7](#)

ORGANIZATION

Bayer CropScience

Website: <http://www.bayercropscience.com>

Description

The modified maize (*Zea mays*) was produced through cross breeding of modified parental lines to express tolerance to herbicides and resistance to insects. For Lepidoptera resistance, the modified maize expresses *Bacillus thuringiensis* Cry1Ab, commonly known as "Bt toxin". The protein forms pores in the midgut lining of susceptible pests, leading to cell lysis and septicemia. For glyphosate tolerance, the maize expresses *Agrobacterium tumefaciens* 5-enolpyruvylshikimate-3-phosphate synthase, which encodes a bacterial variant of an endogenous enzyme involved in the essential biosynthesis of aromatic amino acids (shikimate pathway). The bacterial protein does not bind the herbicidal compound with high affinity and thus prevents inactivation of the enzyme.

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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

BCH-LMO-SCBD-104758-3 LIVING MODIFIED ORGANISM | MON-87427-7 - MAIZE MODIFIED FOR TISSUE SELECTIVE GLYPHOSATE TOLERANCE |

Resistance to herbicides - Glyphosate

BCH-LMO-SCBD-14750-19 LIVING MODIFIED ORGANISM | MON-ØØ81Ø-6 - YIELDGARD™ MAIZE |

Resistance to diseases and pests - Insects - Lepidoptera (butterflies and moths)

Characteristics of the modification process

Vector

PV-ZMAP1043; PV-ZMBK07 and PV-ZMGT10

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Techniques used for the modification

Cross breeding

Genetic elements construct

P-e35S-CaMV
0.620 kb

I-hsp70-MAIZE
0.800 kb

TP-ctp2-ARATH
0.230 kb

CS-CP4epsps-RHIRD
1.370 kb

T-nos-RHIRD
0.250 kb

P-e35S-CaMV
0.610 kb

I-hsp70-MAIZE
0.800 kb

CS-Cry1Ab-BACTU
3.460 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-100366-6 CAMV ENHANCED 35S PROMOTER |

Promoter

BCH-GENE-SCBD-100359-7 HSP70 INTRON | (MAIZE, CORN) |

Intron

BCH-GENE-SCBD-100365-6 CHLOROPLAST TRANSIT PEPTIDE 2 | (THALE CRESS) |

Transit signal

BCH-GENE-SCBD-14979-7 5-ENOLPYRUVYLSHIKIMATE-3-PHOSPHATE SYNTHASE GENE |

Protein coding sequence | Resistance to herbicides (Glyphosate)

BCH-GENE-SCBD-100269-8 NOPALINE SYNTHASE GENE TERMINATOR |

Terminator

BCH-GENE-SCBD-14985-12 CRY1AB | BACILLUS THURINGIENSIS - BT, BACILLUS, BACTU |

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

Notes regarding the genetic elements present in this LMO

DNA insert from MON87427 (MON-87427-7) vector PV-ZMAP1043

Transcription of *Agrobacterium tumefaciens* 5-enolpyruvylshikimate-3-phosphate synthase (*epsps*) commences from the *Cauliflower mosaic virus* (CaMV) enhanced 35S promoter and terminates at the *A. tumefaciens* nopaline synthase (*nos*) terminator. The transcript contains a *Zea mays* heat shock protein 70 (*hsp70*) intron, an *Arabidopsis thaliana* N-terminal chloroplast transit peptide sequence for chloroplast targeting of the protein and *epsps*. The CaMV enhanced 35S promoter-*hsp70* combination promotes gene expression in female and vegetative tissues, but not in male reproductive tissues (pollen microspores and tapetum).

Note:

- Southern blot analyses indicate that a single copy of the T-DNA was inserted at a single site in the parental maize genome and no plasmid vector backbone sequences were detected to have been integrated. DNA sequencing analyses further indicated that the expected T-DNA sequences were integrated.
- The *epsps* coding sequence is the codon optimized coding sequence of the *aroA* gene from *Agrobacterium sp.* strain CP4 encoding EPSPS.

DNA insert from MON810 (MON-ØØ81Ø-6) vector PV-ZMBK07

A partial insert containing *Bacillus thuringiensis cry1Ab* was inserted into the parental maize genome. Transcription is directed from the *Cauliflower mosaic virus* 35S enhanced promoter. The transcript contains a *Zea mays* heat shock protein 70 (*ZmHsp70*) intron and the coding sequence of *cry1Ab*. *ZmHsp70* enhances expression of *cry1Ab*.

Note:

- The coding sequence of *cry1Ab* has been codon optimized for expression in plants. The codon optimization did not result in any changes to the amino acid sequence relative to the native sequence.
- Southern blot analysis indicated that a single partial insert is found within the parental genome.
- Southern blot analysis did not detect the presence of the *Escherichia coli* neomycin phosphotransferase II gene nor any DNA from plasmid PVZMGT10 (containing genes for glyphosate tolerance - *epsps*).
- ELISA protein analysis and feeding assays indicated expression of Cry1Ab.

Kindly refer to the parental LMO records for more information.

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LMO characteristics

Modified traits

- Resistance to diseases and pests
 - Insects
 - Lepidoptera (butterflies and moths)
- Resistance to herbicides
 - Glyphosate

Common use(s) of the LMO

Food

Feed

Detection method(s)

External link(s)

? [MON-87427-7 - EU Reference Laboratory for GM Food and Feed \(EURL-GMFF\)](#) (*English*)

? [MON-ØØ81Ø-6 - EU Reference Laboratory for GM Food and Feed \(EURL-GMFF\)](#) (*English*)

Additional Information

Other relevant website addresses and/or attached documents

? [EUGINIUS: MON87427 x MON810](#) (*English*)

[BCH-LMO-SCBD-115718-1](#)

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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