

Biosafety Clearing-House (BCH)

LIVING MODIFIED ORGANISM (LMO)


BCH-LMO-SCBD-40284-18

[? 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.



MON-89788-1
Roundup Ready2Yield™ soybean

CBD

<https://bch.cbd.int/database/record?documentID=40284>



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

Name

Roundup Ready2Yield™ soybean

EN

Transformation event

MON89788

Unique identifier

MON-89788-1

Developer(s)

- [ORGANIZATION: MONSANTO](#) | [BCH-CON-SCBD-40283-1](#)

ORGANIZATION

Monsanto

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

Description

MON89788 is a second-generation glyphosate-tolerant soybean product, was developed by introduction of the cp4 epsps gene cassette consisting of chimeric promoter sequence derived from Arabidopsis thaliana Tsfl gene promoter and enhancer sequences and from the 35S of the Figwort Mosaic Virus. In addition, the transformation was based on a new technique of Agrobacterium-mediated gene delivery to soybean meristem, where cells were induced directly to form shoots and give rise to transgenic plants

EN

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-10453-6](#) ORGANISM | GLYCINE MAX (SOYBEAN, SOYA BEAN, SOYA, SOYBN) |

Crops

Point of collection or acquisition of the recipient organism or parental organisms

Variety: A3244

EN

Related LMO(s)

[BCH-LMO-SCBD-14796-14](#) | MON-Ø4Ø32-6 - Roundup Ready™ soybean | Monsanto | Resistance to herbicides (Glyphosate)

[Show detection method\(s\)](#)

Characteristics of the modification process

Vector

PV-GMGOX20

EN

Techniques used for the modification

Agrobacterium-mediated DNA transfer

Genetic elements construct

L-35s-CMoVb

1.039 kb

P-TSF1

0.000 kb

L-TSF1

0.045 kb

I-TSF1

0.621 kb

TP-ctp2-ARATH

0.227 kb

CS-CP4epsps-RHIRD

1.367 kb

T-rbcS_E9-PEA

0.642 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-14979-7](#) 5-ENOLPYRUVYLSHIKIMATE-3-PHOSPHATE SYNTHASE GENE |

Protein coding sequence | Resistance to herbicides (Glyphosate)

[BCH-GENE-SCBD-103903-1](#) ELONGATION FACTOR EF-1ALPHA PROMOTER | (THALE CRESS) |

Promoter

[BCH-GENE-SCBD-103904-1](#) ELONGATION FACTOR EF-1ALPHA LEADER | (THALE CRESS) |

Leader

[BCH-GENE-SCBD-103905-1](#) ELONGATION FACTOR EF-1ALPHA INTRON 1 | (THALE CRESS) |

Intron

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

Transit signal

[BCH-GENE-SCBD-101877-5](#) RBCS-E9 GENE TERMINATOR | (GARDEN PEA) |

Terminator

[BCH-GENE-SCBD-105196-2](#) FMV 35S ENHANCER |

Leader

Information on the inserted DNA sequences:

The DNA inserted into the soybean genome contains:

- Codon optimized coding sequence of the aroA (epsps) gene from the Agrobacterium sp. strain CP4 encoding the CP4 EPSPS protein.
- a chimeric transcriptional promoter (P-FMV/Tsf1) consisting of chimeric sequence derived from Arabidopsis thaliana Tsf1 gene promoter and enhancer sequences from the 35S of the Figwort Mosaic Virus. Located between the promoter and the cp4epsps coding sequence are the non-translated leader sequence (L-Tsf1) and the I-Tsf1 non translated intron;
- a chloroplast transit peptide sequence (TS-CTP2), derived from the Arabidopsis thaliana epsps gene and placed before the cp4 epsps gene encoding sequence in the gene insert;
- a polyadenylation sequence from RbcS2 gene (T-E9), derived from Pisum sativum containing the 3' non translated region of the pea ribulose-1,5 biphosphate carboxylase small sub unit E9.

EN

Vector information

The PV-GMGOX20 vector is approximately 9.7 kb and contains a cp4 epsps gene expression cassette delineated by left and right border regions. The T-DNA (transferred DNA) that is incorporated into the soybean genome is approximately 4.3 kb, and the DNA backbone region that is not incorporated into the soybean genome is approximately 5.4kb.

Southern blot analyses indicate that MON 89788 contains a single intact cp4 epsps expression cassette integrated at a single locus within the soybean genome. DNA sequencing analyses of the MON 89788 insert confirm the expected coding region of the cp4 epsps gene cassette, is identical to that transformed in the T-DNA cassette. No backbone sequences from the transformation plasmid were detected and no partial genetic elements, linked or unlinked to the inserted expression cassette were detected.

LMO characteristics

Modified traits

Resistance to herbicides
Glyphosate

Common use(s) of the LMO

Food
Feed

Detection method(s)

External link(s)

- ? [MON-89788-1 - EU Reference Laboratory for GM Food and Feed \(EURL-GMFF\) \(English \)](#)
- ? [MON-89788-1 - CropLife International Detection Methods Database \(English \)](#)

Additional Information

Additional Information

The soybean line MON98788 was developed to allow for the use of glyphosate, the active ingredient in the herbicide Roundup®, as a weed control option for soybean. This genetically engineered soybean variety contains a glyphosate tolerant form of the plant enzyme 5-enolpyruvylshikimate-3-phosphate synthase (EPSPS) isolated from the common soil bacterium, *Agrobacterium tumefaciens* strain CP4 (CP4 EPSPS).

The EPSPS enzyme is part of the shikimate pathway that is involved in the production of aromatic amino acids and other aromatic compounds in plants. When conventional plants are treated with glyphosate, the plants cannot produce the aromatic amino acids needed to survive. This enzyme is present in all plants, bacteria, fungi, but not in animals, which do not synthesize their own aromatic amino acids. Because the aromatic amino acid biosynthetic pathway is not present in mammalian, avian or aquatic life forms, glyphosate has little if any toxicity for these organisms. The EPSPS enzyme is normally present in food derived from plant and microbial sources.

Other relevant website addresses and/or attached documents

? [MON-89788 - CERA GM Database](#) (*English*)

? [MON-89788 - OECD](#) (*English*)

? [MON-89788 - Monsanto.pdf](#) (*English*)

? [MON-89788 - GMO Compass](#) (*English*)

BCH-LMO-SCBD-40284-18

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**

413 rue Saint-Jacques, suite 800
Montreal, Québec, H2Y 1N9
Canada

Fax: +1 514 288-6588

Email: secretariat@cbd.int