

Biosafety Clearing-House (BCH)

LIVING MODIFIED ORGANISM (LMO)


BCH-LMO-SCBD-14853-5

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

LAST UPDATED: 18 JAN 2013

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.



ACS-GMØØ2-9
Herbicide-tolerant soybean

CBD

<https://bch.cbd.int/database/record?documentID=14853>



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

Name

Herbicide-tolerant soybean

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Transformation event

W62

Unique identifier

ACS-GMØØ2-9

Developer(s)

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

ORGANIZATION

Bayer CropScience

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

Description

The soybean lines W62 and W98 were genetically engineered to express tolerance to glufosinate ammonium, the active ingredient in phosphinothricin herbicides (Basta®, Rely®, Finale®, and Liberty®). Glufosinate chemically resembles the amino acid glutamate and acts to inhibit an enzyme, called glutamine synthetase, which is involved in the synthesis of glutamine. Essentially, glufosinate acts enough like glutamate, the molecule used by glutamine synthetase to make glutamine, that it blocks the enzyme's usual activity. Glutamine synthetase is also involved in ammonia detoxification. The action of glufosinate results in reduced glutamine levels and a corresponding increase in concentrations of ammonia in plant tissues, leading to cell membrane disruption and cessation of

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photosynthesis resulting in plant withering and death.

Glufosinate tolerance in W62 and W98 soybean lines is the result of introducing a gene encoding the enzyme phosphinothricin-N-acetyltransferase (PAT) isolated from the common aerobic soil actinomycete, *Streptomyces hygroscopicus*, the same organism from which glufosinate was originally isolated. The PAT enzyme catalyzes the acetylation of phosphinothricin, detoxifying it into an inactive compound. The PAT enzyme is not known to have any toxic properties. The PAT encoding gene (bar) was introduced into the soybean genome by micro-particle acceleration (biolistic) transformation, and the resulting soybean lines displayed field tolerance to phosphinothricin-containing herbicides, thereby permitting farmers to use this herbicide for weed control in soybean cultivation.

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

Related LMO(s)

[BCH-LMO-SCBD-14764-9](#) | ACS-GMØØ5-3 - Herbicide-tolerant soybean | Resistance to herbicides - Glufosinate
[Show detection method\(s\)](#)
[BCH-LMO-SCBD-14852-5](#) | ACS-GMØØ1-8 - Herbicide-tolerant soybean | Resistance to antibiotics - Ampicillin Resistance to herbicides - Glufosinate Selectable marker genes and reporter genes
[BCH-LMO-SCBD-14854-5](#) | ACS-GMØØ3-1 - Herbicide-tolerant soybean | Resistance to herbicides - Glufosinate
[BCH-LMO-SCBD-14855-5](#) | ACS-GMØØ4-2 - Herbicide-tolerant soybean | Resistance to herbicides - Glufosinate
[BCH-LMO-SCBD-14857-8](#) | ACS-GMØØ6-4 - Liberty Link™ soybean | Resistance to herbicides - Glufosinate
[Show detection method\(s\)](#)
[BCH-LMO-SCBD-15418-5](#) | ACS-GMØØ8-6 - Herbicide-tolerant soybean | Resistance to herbicides - Glufosinate

Characteristics of the modification process

Vector

pWRG2114 (AKA: CMC2114)

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Techniques used for the modification

Biolistic / Particle gun

Genetic elements construct

P-35S-CaMV	L-RNA4-AMV	CS-bar-STRHY	T-SSU-SOYBN
0.430 kb	0.035 kb	0.550 kb	0.320 kb

T-nos-RHIR 0.260 kb	CS-uidA-EC 1.810 kb	L-RNA4- 0.035 kb	P-35S-CaMV 0.430 kb
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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-14972-12 PHOSPHINOTHRICIN N-ACETYLTRANSFERASE GENE |

Protein coding sequence | Resistance to herbicides (Glufosinate)

BCH-GENE-SCBD-100287-7 CAMV 35S PROMOTER |

Promoter

BCH-GENE-SCBD-103886-2 5' UNTRANSLATED LEADER OF AMV RNA4 | (ALFALFA MOSAIC VIRUS, AMV) |

Leader

BCH-GENE-SCBD-104632-2 RUBISCO SSU TERMINATOR | (SOYBEANS) |

Terminator

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

Terminator

BCH-GENE-SCBD-46004-7 BETA-GLUCURONIDASE CODING SEQUENCE | (BACTERIA) |

Protein coding sequence | Selectable marker genes and reporter genes

BCH-GENE-SCBD-14975-5 BETA-LACTAMASE GENE | (BACTERIA) |

Protein coding sequence | Resistance to antibiotics (Ampicillin)

Notes regarding the genetic elements present in this LMO

The ampicillin resistance gene, beta-lactamase, was also integrated into the host genome.

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LMO characteristics

Modified traits

Resistance to herbicides

Glufosinate

Resistance to antibiotics

Ampicillin

Common use(s) of the LMO

Food

Detection method(s)

Additional Information

Southern Blot analysis indicated that the W98 line contains approximately 2 intact copies of the BAR, GUS and ampr genes.

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Additional Information

Other relevant website addresses and/or attached documents

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

? [W62, W98 APHIS.pdf](#) (*English*)

[BCH-LMO-SCBD-14853-5](#)

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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