

Biosafety Clearing-House (BCH)

LIVING MODIFIED ORGANISM (LMO)


BCH-LMO-SCBD-14759-8

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

LAST UPDATED: 04 APR 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-BNØØ5-8
InVigor™ canola

CBD

<https://bch.cbd.int/database/record?documentID=14759>



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

Name

InVigor™ canola

EN

Transformation event

MS8

Unique identifier

ACS-BNØØ5-8

Developer(s)

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

ORGANIZATION

Bayer CropScience

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

Description

Canola with male-sterility system displaying glufosinate herbicide tolerance. Contains the barnase gene from *Bacillus amyloliquefaciens* and the bar gene encoding phosphinothricin N-acetyltransferase from *Streptomyces hygroscopicus*.

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-12083-7](#) ORGANISM | BRASSICA NAPUS (TURNIP, RAPESEED, CANOLA PLANT,

OILSEED RAPE, RAPE, BRANA)

Crops

Related LMO(s)

[BCH-LMO-SCBD-14755-7](#) | ACS-BNØØ3-6 - InVigor™ canola | Changes in physiology and/or production - Fertility restoration Resistance to herbicides - Glufosinate
[Show detection method\(s\)](#)

Characteristics of the modification process

Vector

pTHW107

EN

Techniques used for the modification

Agrobacterium-mediated DNA transfer

Genetic elements construct

P-ta29-TOBAC
1.510 kb

CS-barnase-BACAM
0.335 kb

T-Barnase3UTR-BACAS
0.111 kb

T-nos-RHIRD
0.260 kb

P-rbcS-ARATH
1.725 kb

CS-bar-STRHY
0.551 kb

T-tr7-RHIRD
0.211 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-14973-6](#) BARNASE |

Protein coding sequence | Changes in physiology and/or production (Reproduction, Male sterility)

[BCH-GENE-SCBD-14972-12](#) PHOSPHINOTHRICIN N-ACETYLTRANSFERASE GENE |

Protein coding sequence | Resistance to herbicides (Glufosinate)

[BCH-GENE-SCBD-101407-6](#) PTA29 POLLEN SPECIFIC PROMOTER | (TOBACCO PLANT) |

Promoter

[BCH-GENE-SCBD-104825-2](#) BARNASE 3' UNTRANSLATED REGION |

Terminator

[BCH-GENE-SCBD-100269-8](#) NOPALINE SYNTHASE GENE TERMINATOR |

Terminator

[BCH-GENE-SCBD-103851-5](#) RBCS PROMOTER | (THALE CRESS) |

Promoter

[BCH-GENE-SCBD-103067-9](#) TRANSCRIPT 7 GENE 3' UNTRANSLATED REGION |

Terminator

Notes regarding the genetic elements present in this LMO

On the N-terminal two codons of the wild type bar coding region have been substituted for the codons ATG and GAC.

EN

Southern blot and PCR analysis indicated that a single intact copy of the transformation cassette was integrated into the host genome.

LMO characteristics

Modified traits

Resistance to herbicides
 Glufosinate
Resistance to antibiotics
 Kanamycin
Changes in physiology and/or production
 Reproduction
 Male sterility

Common use(s) of the LMO

Food
Feed

Detection method(s)

External link(s)

? [ACS-BN005-8 - EU Reference Laboratory for GM Food and Feed \(EURL-GMFF\)](#) (English)

Additional Information

Additional Information

The transgenic MS8 plants do not produce viable pollen grains and cannot self-pollinate. In order to restore fertility in the hybrid progeny, line MS8 must be pollinated by a modified plant containing a fertility restorer gene. The resultant hybrid seed derived from the cross generates hybrid plants that produce pollen and are completely fertile.

The male-sterile trait was introduced in MS1 by inserting the barnase gene, isolated from *Bacillus amyloliquefaciens*, a common soil bacterium that is frequently used as a source for industrial enzymes. The barnase gene encodes for a ribonuclease enzyme (RNase) that is expressed only in the tapetum cells of the pollen sac during anther development. The RNase affects RNA production, disrupting normal cell functioning and arresting early anther development, thus leading to male sterility.

MS8 was also 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 photosynthesis resulting in plant withering and death.

Other relevant website addresses and/or attached documents

? [OECD UID Database](#) (*English*)

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

? [InVigor™ canola - Monsanto.pdf](#) (*English*)

[BCH-LMO-SCBD-14759-8](#)

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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