LIVING MODIFIED ORGANISM (LMO)

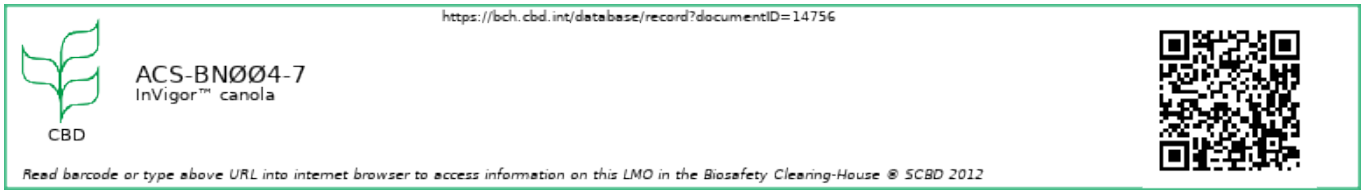
BCH-LMO-SCBD-14756-5

? Decisions on the LMO ? Risk Assessments

LAST UPDATED: 27 MAY 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.



Name

InVigor™ canola | EN

Transformation event

MS1 (B91-4)

Unique identifier

ACS-BNØØ4-7

Developer(s)

- ORGANIZATION: BAYER CROPSCIENCE | BCH-CON-SCBD-7088-7

ORGANIZATION

Bayer CropScience
Website: http://www.bayercropscience.com

Description

Canola 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 to confer tolerance to the herbicide phosphinothricin (Glufosinate ammonium). Also contains the neomycin phosphotransferase II (npt II) gene conferring resistance to the antibiotic kanamycin. | 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-14753-6 | ACS-BNØØ1-4 - InVigor™ canola | Changes in physiology and/or production - Fertility restoration Resistance to antibiotics - Kanamycin Resistance to herbicides - Glufosinate

Show detection method(s)

BCH-LMO-SCBD-14754-5 | ACS-BNØØ2-5 - InVigor™ canola | Changes in physiology and/or production - Fertility restoration Resistance to antibiotics - Kanamycin Resistance to herbicides - Glufosinate

Show detection method(s)

Characteristics of the modification process

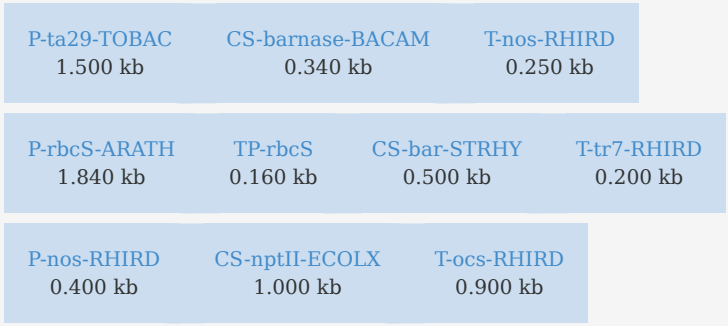
Vector

pTTM8RE | EN

Techniques used for the modification

Agrobacterium-mediated DNA transfer

Genetic elements construct



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-15001-5 NEOMYCIN PHOSPHOTRANSFERASE II | (BACTERIA)

Protein coding sequence | Resistance to antibiotics (Kanamycin)

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

Promoter

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

Terminator

BCH-GENE-SCBD-103851-5 RBCS PROMOTER | (THALE CRESS)
Promoter

BCH-GENE-SCBD-101902-4 RBCS TRANSIT PEPTIDE | (THALE CRESS)
Transit signal

BCH-GENE-SCBD-103067-9 TRANSCRIPT 7 GENE 3' UNTRANSLATED REGION
Terminator

BCH-GENE-SCBD-100270-6 NOPALINE SYNTHASE GENE PROMOTER
Promoter

BCH-GENE-SCBD-100271-5 OCTOPINE SYNTHASE GENE TERMINATOR
Terminator

Notes regarding the genetic elements present in this LMO

Southern blot analysis indicated that a single copy of the T-DNA was inserted into the host genome at a single site. There was no indication from the tests that any sequences from the vector backbone were integrated into the genome.	EN

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)

? Event-specific Method for the Quantification of Oilseed Rape MS1 using Real-time PCR *(English)*

Additional Information

Additional Information

The transgenic MS1 plants do not produce viable pollen grains and cannot self-pollinate. In order to restore fertility in the hybrid progeny, line MS1 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.

MS1 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

? ACS-BNØØ4-7 - OECD *(English)*

? ACS-BNØØ4-7 - CERA *(English)*

? ACS-BNØØ4-7×ACS-BNØØ1-4 - ANZFA.pdf *(English)*

? ACS-BNØØ4-7×ACS-BNØØ1-4 - Japan.pdf *(English)*

? MS1_RF1_RF2 - Aventis.pdf *(English)*

BCH-LMO-SCBD-14756-5

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
413 rue Saint-Jacques, suite 800
Montreal, Québec, H2Y 1N9
Canada
Fax: +1 514 288-6588
Email: secretariat@cbd.int