

Biosafety Clearing-House (BCH)

LIVING MODIFIED ORGANISM (LMO)


BCH-LMO-SCBD-14903-8

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

LAST UPDATED: 29 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.



NMK-89653-6
New Leaf™ Y Russet Burbank potato

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=14903>


Name

New Leaf™ Y Russet Burbank potato

EN

Transformation event

RBMT15-101

Unique identifier

NMK-89653-6

Developer(s)

- [ORGANIZATION: MONSANTO](#) | [BCH-CON-SCBD-14925-3](#)

ORGANIZATION

Monsanto
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Description

Potatoes with insect-resistance and resistance to potato virus Y through inclusion of the cry3A gene from *Bacillus thuringiensis* which confers resistance to coleopteran pests, and DNA sequences corresponding to potato virus Y (PVY) coat protein domains which confers resistance to PVY.

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-12106-6](#) ORGANISM | SOLANUM TUBEROSUM (POTATO, SOLTU) |

Crops

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

Cultivar: Russet Burbank

EN

Related LMO(s)

[BCH-LMO-SCBD-14912-7](#) | NMK-89930-4 - Shepody NewLeaf™ Y potato | Resistance to antibiotics - Kanamycin, Streptomycin Resistance to diseases and pests - Insects - Coleoptera (beetles), Viruses - Potato virus Y (PVY)

[BCH-LMO-SCBD-14911-8](#) | NMK-89935-9 - Shepody NewLeaf™ Y potato | Resistance to antibiotics - Kanamycin, Streptomycin Resistance to diseases and pests - Insects - Coleoptera (beetles), Viruses - Potato virus Y (PVY)

Characteristics of the modification process

Vector

PV-STMT15

EN

Techniques used for the modification

Agrobacterium-mediated DNA transfer

Genetic elements construct

[P-rbcS-ARATH](#)
1.700 kb

[CS-Cry3A-BACTU](#)
1.800 kb

[T-nos-RHIRD](#)
0.260 kb

[P-nos-RHIRD](#)
0.300 kb

[CS-nptII-ECOLX](#)
0.790 kb

[T-nos-RHIRD](#)
0.450 kb

[P-34S-FMV](#)
0.570 kb

[L-HSP17_9-SOYBN](#)
0.080 kb

[CS-cp-PVY](#)
0.810 kb

[T-rbcS_E9-PEA](#)
0.630 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-15020-3](#) PVY COAT PROTEIN |

Protein coding sequence | Resistance to diseases and pests (Viruses, Potato virus Y (PVY))

[BCH-GENE-SCBD-14989-5](#) CRY3A | BACILLUS THURINGIENSIS - BT, BACILLUS, BACTU |

Protein coding sequence | Resistance to diseases and pests (Insects, Coleoptera (beetles))

[BCH-GENE-SCBD-15001-5](#) NEOMYCIN PHOSPHOTRANSFERASE II | (BACTERIA) |

Protein coding sequence | Resistance to antibiotics (Kanamycin)

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

Promoter

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

Terminator

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

Promoter

BCH-GENE-SCBD-101507-5 FMV 34S PROMOTER |

Promoter

BCH-GENE-SCBD-103922-2 HSP17.9 LEADER SEQUENCE | (SOYBEANS) |

Leader

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

Terminator

Notes regarding the genetic elements present in this LMO

Integration of the T-DNA occurred at three to four loci. At least one locus contained two copies of the T-DNA organized in inverted orientations. For two copies of the T-DNA, transfer was incomplete at the right border resulting in an incomplete copy of the figwort mosaic virus (FMV) 35S promoter associated with the PVY CP gene.

One of the cry3Aa genes also lacked the Arabidopsis small subunit promoter and a portion of the 5' end of the gene. The NOS terminator region of this gene cassette was intact. One of the T-DNAs also had an incomplete NOS promoter region associated with an intact NPTII coding region.

The coding regions of all the other genetic elements were intact. The analyses also showed that no plasmid sequences beyond the left and right borders were transferred.

EN

LMO characteristics

Modified traits

Resistance to diseases and pests

Insects

Coleoptera (beetles)

Viruses

Potato virus Y (PVY)

Resistance to antibiotics

Kanamycin

Streptomycin

Common use(s) of the LMO

Food

Additional Information

Additional Information

The transgenic potato line RBMT15-101 was produced using recombinant DNA techniques and contain two novel genes, whose individual expression results in resistance to attack by Colorado potato beetle (CPB; *Leptinotarsa decemlineata*) and resistance to infection by Potato Virus Y strain O (PVY-O). Resistance to attack by CPB was accomplished by introducing the cry3A gene from *Bacillus thuringiensis* subsp. *tenebrionis*, which encodes an insecticidal crystalline Cry3A delta-endotoxin protein. The insecticidal activity of Cry3A protein is due to its selective binding to specific sites localized on the brush border midgut epithelium of susceptible insect species. Following binding, cation-specific pores are formed that disrupt midgut ion flow and thereby cause gut paralysis, ultimately leading to bacterial sepsis and death. Delta-endotoxins, such as the Cry3A protein expressed in CPB resistant potato lines, exhibit highly selective insecticidal activity against a narrow range of coleopteran insects such as CPB, elm leaf beetle and yellow mealworm. Their specificity of action is directly attributable to the presence of specific receptors in the target insects. There are no receptors for delta-endotoxins of *B. thuringiensis* on the surface of mammalian intestinal cells, therefore, livestock animals and humans are not susceptible to these proteins.

Pathogen-derived resistance to PVY was conferred by introducing the coat protein (CP) gene from PVY-O. The coat protein forms a protective coat around the RNA genome of the virus and comprises 95% by mass of the virus particle. Although the exact mechanism is not fully understood, these transgenic potato lines exhibit resistance to infection and subsequent disease caused by PVY through a process that is related to viral cross-protection.

Other relevant website addresses and/or attached documents

? [RBMT15-101 - OECD](#) (*English*)

[RBMT15-101 - CERA](#) (*English*)

? [RBMT15-101 - Monsanto.pdf](#) (*English*)

? [RBMT15-101 - ANZFA.pdf](#) (*English*)

[BCH-LMO-SCBD-14903-8](#)

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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