

Biosafety Clearing-House (BCH)

LIVING MODIFIED ORGANISM (LMO)


BCH-LMO-SCBD-15392-4

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

LAST UPDATED: 25 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.



New Leaf™ Plus 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=15392>



Name

New Leaf™ Plus Russet Burbank potato

EN

Transformation event

RBMT22-262

Developer(s)

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

ORGANIZATION

Monsanto
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Description

Potatoes with insect-resistance and resistance to potato leafroll virus through inclusion of the cry3A gene from *Bacillus thuringiensis* which confers resistance to coleopteran pests, and DNA sequences corresponding to potato leafroll virus (PLRV) helicase and replicase domains which confers resistance to PLRV. The epsps gene confers tolerance to the herbicide glyphosate.

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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

Related LMO(s)

BCH-LMO-SCBD-14910-6 | NMK-89896-6 - New Leaf™ Plus Russet Burbank potato | Resistance to diseases and pests - Insects - Coleoptera (beetles), Viruses - Potato leaf roll virus (PLRV) Resistance to herbicides - Glyphosate
BCH-LMO-SCBD-15390-4 | New Leaf™ Plus Russet Burbank potato | Resistance to diseases and pests - Insects - Coleoptera (beetles), Viruses - Potato leaf roll virus (PLRV) Resistance to herbicides - Glyphosate
BCH-LMO-SCBD-15391-4 | New Leaf™ Plus Russet Burbank potato | Resistance to diseases and pests - Insects - Coleoptera (beetles), Viruses - Potato leaf roll virus (PLRV) Resistance to herbicides - Glyphosate

Characteristics of the modification process

Vector

PV-STMT22

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-34S-FMV 0.570 kb	L-HSP17_9-SOYBN 0.080 kb	CS-rep-PLRV 3.400 kb	T-rbcS_E9-PEA 0.360 kb
P-34S-FMV 0.570 kb	TP-ctp2-ARATH 0.230 kb	CS-CP4epsps-RHIRD 1.400 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-14989-5 CRY3A | BACILLUS THURINGIENSIS - BT, BACILLUS, BACTU |
Protein coding sequence | Resistance to diseases and pests (Insects, Coleoptera (beetles))

BCH-GENE-SCBD-14979-7 5-ENOLPYRUVYLSHIKIMATE-3-PHOSPHATE SYNTHASE GENE |
Protein coding sequence | Resistance to herbicides (Glyphosate)

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

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

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

Promoter

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

Leader

BCH-GENE-SCBD-104847-2 PLRV REPLICASE GENE |

Protein coding sequence | Resistance to diseases and pests (Viruses, Potato leaf roll virus (PLRV))

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

Terminator

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

Transit signal

Notes regarding the genetic elements present in this LMO

The coding sequence of the Cry3A gene was modified to plant preferred codons. This resulted in changes to 399 of 1791 nucleotides but there were no changes to the resulting amino acid sequence.

PCR analysis indicated that the transformation cassette was inserted into the host genome in the same orientation as in the vector. Additionally no fragments outside the left and right border were detected.

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LMO characteristics

Modified traits

- Resistance to diseases and pests
 - Insects
 - Coleoptera (beetles)
 - Viruses
 - Potato leaf roll virus (PLRV)
- Resistance to herbicides
 - Glyphosate

Common use(s) of the LMO

Food

Additional Information

Additional Information

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.

Introducing DNA sequences corresponding to the ORF-1 and ORF-2 regions from PLRV conferred resistance to PLRV infection. These two ORFs encode the putative viral helicase and replicase domains that are required for viral RNA synthesis. The introduced viral sequences do not result in the formation of any infectious particles, nor does their expression result in any disease pathology. These transgenic potato cultivars exhibit the trait of resistance to infection and subsequent disease caused by PLRV through an incompletely understood process that has been termed "replicase-mediated resistance", which may involve silencing of viral gene translation.

The line was also transformed to express resistance to glyphosate, the active ingredient in the herbicide Roundup®, through incorporation of a bacterial gene encoding a glyphosate-tolerant form of the enzyme 5-enolpyruvylshikimate-3-phosphate synthase (EPSPS).

Other relevant website addresses and/or attached documents

? [US EPA Docket No. 99-036-2](#) (*English*)

? [RBMT22-262 - Monsanto.pdf](#) (*English*)

? [RBMT22-262 - FDA](#) (*English*)

[BCH-LMO-SCBD-15392-4](#)

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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