

Biosafety Clearing-House (BCH)

LIVING MODIFIED ORGANISM (LMO)

BCH-LMO-SCBD-105691-3

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

LAST UPDATED: 16 MAY 2022

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.



<https://bch.cbd.int/database/record?documentID=105691>

SYN-BT011-1 x SYN-IR162-4 x SYN-IR604-5 x DAS-01507-1 x SYN-05307-1 x M
Agrisure® Duracade™ 5222



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

Name

Agrisure® Duracade™ 5222

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Transformation event

Bt11 x MIR162 x MIR604 x TC1507 x 5307 x GA21

Unique identifier

SYN-BT011-1 x SYN-IR162-4 x SYN-IR604-5 x DAS-01507-1 x SYN-05307-1 x MON-00021-9

Developer(s)

- **ORGANIZATION:** SYNGENTA SEEDS GMBH | [BCH-CON-SCBD-101875-3](#)

ORGANIZATION

Syngenta Seeds GmbH
Private sector (business and industry)
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Description

A stacked insect-resistant and herbicide-tolerant maize derived from conventional cross-breeding of 5307 x MIR604 x Bt11 x TC1507 x GA21. Insect resistance is conferred by the

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cry1A(b), cryIF, PAT, mcry3A, EPSPS, pmi, vip3Aa20 and eCry3.1Ab genes from the common soil bacterium *Bacillus thuringiensis*, and glufosinate herbicide tolerance through the pat gene from *Streptomyces viridochromogenes*.

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-246-6 ORGANISM | ZEA MAYS (MAIZE, CORN, MAIZE) |

Crops

BCH-LMO-SCBD-100885-13 LIVING MODIFIED ORGANISM | SYN-IR162-4 - AGRISURE™ VIPTERA MAIZE |

Syngenta Crop Protection AG | Resistance to diseases and pests (Insects, Lepidoptera (butterflies and moths))

BCH-LMO-SCBD-104791-4 LIVING MODIFIED ORGANISM | SYN-Ø53Ø7-1 - AGRISURE® DURACADE™ MAIZE |

Syngenta Crop Protection AG | Resistance to diseases and pests (Insects, Coleoptera (beetles), Western corn rootworm (*Diabrotica virgifera*), Northern corn rootworm (*Diabrotica barberi*))

BCH-LMO-SCBD-14794-18 LIVING MODIFIED ORGANISM | MON-ØØØ21-9 - ROUNDUP READY™ MAIZE |

Resistance to herbicides - Glyphosate

BCH-LMO-SCBD-15105-12 LIVING MODIFIED ORGANISM | SYN-IR6Ø4-5 - AGRISURE™ RW ROOTWORM-PROTECTED MAIZE |

Mannose tolerance Resistance to diseases and pests - Insects - Coleoptera (beetles) - Western corn rootworm (*Diabrotica virgifera*) Selectable marker genes and reporter genes

BCH-LMO-SCBD-14797-15 LIVING MODIFIED ORGANISM | SYN-BTØ11-1 - YIELDGARD™ MAIZE |

Resistance to diseases and pests - Insects - Lepidoptera (butterflies and moths) Resistance to herbicides - Glufosinate

BCH-LMO-SCBD-14841-13 LIVING MODIFIED ORGANISM | DAS-Ø15Ø7-1 - HERCULEX™ I MAIZE |

Resistance to diseases and pests (Insects, Lepidoptera (butterflies and moths)), Resistance to herbicides (Glufosinate)

Characteristics of the modification process

Vector

pZO1502, pDPG434, pZM26, pSYN12274, pNOV1300 and PHI8999A

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Techniques used for the modification

Cross breeding

Genetic elements construct

P-ubi1-MAIZE
1.990 kb

CS-vip3Aa20-BACTU
2.370 kb

I-9_pepc-MAIZE
0.110 kb

T-35S-CaMV
0.070 kb

P-ubi1-MAIZE
1.990 kb

CS-pmi-ECOLX
1.180 kb

T-nos-RHIRD
0.250 kb

P-ubi1-MAIZE
1.980 kb

CS-cry1F-BACTU
1.820 kb

T-orf25-RHIRD
0.720 kb

P-35S-CaMV 0.550 kb	CS-pat-STRVR 0.550 kb	T-35S-CaMV 0.200 kb		
P-35S-CaMV 0.510 kb	I-ADH1 intron 6 0.470 kb	CS-Cry1Ab-BACTU 1.850 kb	T-nos-RHIRD 0.250 kb	
P-35S-CaMV 0.420 kb	I-ADH1 intron 2 0.180 kb	CS-pat-STRVR 0.550 kb	T-nos-RHIRD 0.250 kb	
P-act1-ORYSA 1.370 kb	I-1_act1-ORYSA 0.000 kb	TP-OPT 0.370 kb	CS-epsps-MAIZE 1.340 kb	T-nos-RHIRD 0.240 kb
P-MTL-MAIZE 0.000 kb	CS-mCry3A 0.000 kb	T-nos-RHIRD 0.000 kb		
P-ubi1-MAIZE 0.000 kb	I-1_ubi1-MAIZE 0.000 kb	CS-pmi-ECOLX 0.000 kb	T-nos-RHIRD 0.000 kb	
P-CMP-CYLCV 0.350 kb	CS-eCry3_1Ab-BACTU 0.000 kb	T-nos-RHIRD 0.250 kb		
P-ubi1-MAIZE 1.990 kb	I-1_ubi1-MAIZE 0.000 kb	CS-pmi-ECOLX 1.180 kb	T-nos-RHIRD 0.250 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-100362-7 UBIQUITIN GENE PROMOTER | (MAIZE, CORN) |

Promoter

BCH-GENE-SCBD-100887-5 VEGETATIVE INSECTICIDAL PROTEIN 3AA20 |

Protein coding sequence | Resistance to diseases and pests (Insects, Lepidoptera (butterflies and moths))

BCH-GENE-SCBD-101406-4 PHOSPHOENOLPYRUVATE CARBOXYLASE, INTRON 9 | (MAIZE, CORN) |

Intron

BCH-GENE-SCBD-100290-6 CAMV 35S TERMINATOR |

Terminator

BCH-GENE-SCBD-15003-7 PHOSPHOMANNOSE ISOMERASE GENE | (BACTERIA) |

Protein coding sequence | Mannose tolerance, Selectable marker genes and reporter genes

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

Terminator

BCH-GENE-SCBD-14987-8 CRY1F | BACILLUS THURINGIENSIS - BT, BACILLUS, BACTU |

Protein coding sequence | Resistance to diseases and pests (Insects, Lepidoptera (butterflies and moths))

BCH-GENE-SCBD-100363-5 ORF25 POLYA TERMINATOR SEQUENCE |

Terminator

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

Promoter

BCH-GENE-SCBD-15002-4 PHOSPHINOTHRICIN N-ACETYLTRANSFERASE GENE |

Protein coding sequence | Resistance to herbicides (Glufosinate)

BCH-GENE-SCBD-103625-2 ALCOHOL DEHYDROGENASE 1, INTRON 6 | (MAIZE, CORN) |

Intron

BCH-GENE-SCBD-14985-12 CRY1AB | BACILLUS THURINGIENSIS - BT, BACILLUS, BACTU |

Protein coding sequence | Resistance to diseases and pests (Insects, Lepidoptera (butterflies and moths))

BCH-GENE-SCBD-103867-1 ALCOHOL DEHYDROGENASE 1, INTRON 2 | (MAIZE, CORN) |

Intron

BCH-GENE-SCBD-100364-5 RICE ACTIN 1 GENE PROMOTER | (RICE) |

Promoter

BCH-GENE-SCBD-100355-6 RICE ACTIN 1, INTRON | (RICE) |

Intron

BCH-GENE-SCBD-101419-4 OPTIMIZED TRANSIT PEPTIDE |

Transit signal

BCH-GENE-SCBD-103881-2 METALLOTHIONEIN-LIKE GENE PROMOTER | (MAIZE, CORN) |

Promoter

BCH-GENE-SCBD-43634-3 MCRY3A | BACILLUS THURINGIENSIS - BT, BACILLUS, BACTU |

Protein coding sequence | Resistance to diseases and pests (Insects, Coleoptera (beetles), Western corn rootworm (Diabrotica virgifera))

BCH-GENE-SCBD-103627-5 UBIQUITIN INTRON 1 | (MAIZE, CORN) |

Intron

BCH-GENE-SCBD-104788-2 CESTRUM YELLOW LEAF CURLING VIRUS PROMOTER |

Promoter

BCH-GENE-SCBD-104789-2 ECRY3.1AB |

Protein coding sequence | Resistance to diseases and pests (Insects, Coleoptera (beetles), Western corn rootworm (Diabrotica virgifera), Northern corn rootworm (Diabrotica barberi))

BCH-GENE-SCBD-46333-8 5-ENOLPYRUVYLSHIKIMATE-3-PHOSPHATE SYNTHASE | (MAIZE, CORN) |

Protein coding sequence | Resistance to herbicides (Glyphosate)

Notes regarding the genetic elements present in this LMO

DNA insert from Bt 11 vector pZO1502

Contributed the cry1Ab gene to confer resistance to the European corn borer (*Ostrinia nubilalis*), and the phosphinothricin N-acetyltransferase (PAT) encoding gene to confer tolerance to phosphinothricin (PPT) herbicide, specifically glufosinate ammonium.

DNA insert from GA21 vector pDPG434

The 5-enolpyruvyl shikimate-3-phosphate synthase (epsps) gene from maize was modified through site-directed mutagenesis, such that its encoded enzyme was insensitive to inactivation by glyphosate. The resulting gene was used to develop GA21

DNA insert from MIR604 vector pZM26

Cry3A gene was modified for enhanced expression in maize and such that the amino acid sequence of the synthetic version of Cry3A is the same as the native protein, except for the modified serine-protease recognition site. The pmr gene encodes the enzyme phosphomannose isomerase (PMI) that allows the plants to utilise mannose as a carbon

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source and is used as a selectable marker.

DNA insert from TC1507 vector PHI8999A

TC1507 modified with the insertion of the Cry1F gene to confer resistance to the European corn borer (*Ostrinia nubilalis*). A transformation cassette coding for phosphinothricin (PPT) herbicide tolerance, specifically glufosinate ammonium, was also inserted into the organism.

DNA insert from 5307 vector pSYN12274

Event 5307 corn plants contain the transgene *ecry3.1Ab* encoding a novel rootworm-control protein, *eCry3.1Ab*, and the transgene *pmi* encoding the enzyme phosphomannose isomerase (PMI).

DNA insert from MIR162 vector pNOV1300

MIR162 maize is transformed with *vip3Aa20* gene which encodes the Vip3Aa20 protein that confers resistance against lepidopteran insect pests. Event MIR162 maize also contains the *manA* gene from *Escherichia coli*, which encodes the selectable marker, phosphomannose isomerase (PMI).

For additional information on this LMO, please refer to the records of the parental LMOs.

LMO characteristics

Modified traits

Resistance to diseases and pests

Insects

Coleoptera (beetles)

Lepidoptera (butterflies and moths)

Resistance to herbicides

Glufosinate

Glyphosate

Common use(s) of the LMO

Feed

Food

Detection method(s)

External link(s)

? [Event-specific Method for the Quantification of Maize MIR162 Using Real-time PCR.pdf](#) (*English*)

? [SYN-BTØ11-1 - EU Reference Laboratory for GM Food and Feed \(EURL-GMFF\)](#) (*English*)

? [MON-ØØØ21-9 - EU Reference Laboratory for GM Food and Feed \(EURL-GMFF\)](#) (*English*)

? [SYN-IR6Ø4-5 - EU Reference Laboratory for GM Food and Feed \(EURL-GMFF\)](#) (*English*)

? [DAS-Ø15Ø7-1 - EU Reference Laboratory for GM Food and Feed \(EURL-GMFF\)](#) (*English*)

Additional Information

Other relevant website addresses and/or attached documents

? [SYN-Ø53Ø7-1 x SYN-IR6Ø4-5 x SYN-BTØ11-1 x DAS-Ø15Ø7-1 x MON-ØØØ21-9 x SYN-IR162-4 - ISAAA \(English \)](#)

[BCH-LMO-SCBD-105691-3](#)

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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