

## Biosafety Clearing-House (BCH)

LIVING MODIFIED ORGANISM (LMO)


BCH-LMO-SCBD-115048-1

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

LAST UPDATED: 15 JUL 2019


### 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.



DP-305423-1 X MON-87708-9  
Herbicide-tolerant soybean with high oleic acid content

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=115048>


Name

Herbicide-tolerant soybean with high oleic acid content

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Transformation event

DP305423 x MON87708

Unique identifier

DP-305423-1 x MON-87708-9

Developer(s)

- [ORGANIZATION: DUPONT POINEER](#) | [BCH-CON-SCBD-106199-2](#)

#### ORGANIZATION

Dupont Poineer  
Private sector (business and industry)  
Chestnut Run Plaza 720/1S5 974 Centre Road  
Wilmington,, Delaware  
19805, United States of America

Description

The soybean is the result of a stacked event, created through the cross between TREUS™ Plenish™ and Dicamba-tolerant (MON87708) soybean lines. The modified soy contains *Glycine max* acetohydroxy acid synthase for sulfonylurea herbicide tolerance, *Stenotrophomonas maltophilia* dicamba monooxygenase for tolerance to Dicamba (3,6-dichloro-2-methoxybenzoic acid) and a silencing construct to reduce the expression of endogenous ω-6 desaturase to reduce the production of polyunsaturated fatty acids.

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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-LMO-SCBD-49073-9** LIVING MODIFIED ORGANISM | DP-3Ø5423-1 - TREUS™ PLENISH™ SOYBEAN | Pioneer Hi-Bred Production Inc. | Changes in quality and/or metabolite content (Lipid and fatty acids), Resistance to herbicides (Sulfonylurea)

**BCH-LMO-SCBD-104665-6** LIVING MODIFIED ORGANISM | MON-877Ø8-9 - DICAMBA TOLERANT SOYBEAN | Resistance to herbicides

## Related LMO(s)

**BCH-LMO-SCBD-115047-1** | DP-3Ø5423-1 x MON-89788-1 - Herbicide-tolerant soybean with high oleic acid content | Dr. Wendelyn Jones | Changes in quality and/or metabolite content (Lipid and fatty acids), Resistance to herbicides (Glyphosate, Sulfonylurea)

[Show detection method\(s\)](#)

**BCH-LMO-SCBD-114651-2** | DP-3Ø5423-1 x MON-877Ø8-9 x MON-89788-1 - High oleic acid, herbicide tolerant soy | Dr. Wendelyn Jones | Changes in quality and/or metabolite content (Lipid and fatty acids), Resistance to herbicides (Glyphosate, Sulfonylurea), Tolerance to dicamba (3,6-dichloro-2-methoxybenzoic acid) herbicide.

[Show detection method\(s\)](#)

**BCH-LMO-SCBD-101262-8** | DP-3Ø5423-1 x MON-Ø4Ø32-6 - Modified fatty acid, herbicide-tolerant soybean | Pioneer Hi-Bred Changes in quality and/or metabolite content - Lipid and fatty acids Resistance to herbicides - Glyphosate, Sulfonylurea

[Show detection method\(s\)](#)

## Characteristics of the modification process

### Vector

PHP19340 and PHP17752; PV-GMHT4355

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### Techniques used for the modification

Cross breeding

### Genetic elements construct

P-KTi3  
2.080 kb

FAD2-1  
0.600 kb

T-KTi3  
0.200 kb

P-SAMS  
1.300 kb

CS-ahas-SOYBN  
1.970 kb

T-ahas-SOYBN  
0.600 kb

P-PC1SV-PCSV  
0.430 kb

L-5UTR-TEV  
0.130 kb

TP-rbcS-PEA  
0.240 kb

CS-DMO  
1.020 kb

T-rbcS\_E9-PEA  
0.640 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-103893-1** KUNITZ TRYPSIN INHIBITOR GENE PROMOTER | (SOYBEANS) |

Promoter

**BCH-GENE-SCBD-115046-3** OMEGA-6-DESATURASE | (SOYBEANS) |

Protein coding sequence | Changes in quality and/or metabolite content (Lipid and fatty acids)

**BCH-GENE-SCBD-103894-1** KUNITZ TRYPSIN INHIBITOR GENE TERMINATOR | (SOYBEANS) |

Terminator

**BCH-GENE-SCBD-103895-2** SAMS PROMOTER | (SOYBEANS) |

Promoter

**BCH-GENE-SCBD-100268-6** ACETOHYDROXY ACID SYNTHASE GENE | (SOYBEANS) |

Protein coding sequence | Resistance to herbicides (Sulfonylurea)

**BCH-GENE-SCBD-103896-5** ACETOHYDROXY ACID SYNTHASE GENE TERMINATOR | (SOYBEANS) |

Terminator

**BCH-GENE-SCBD-104662-2** PC1SV PROMOTER | (PCSV, PCLSV) |

Promoter

**BCH-GENE-SCBD-104664-2** TEV 5' UNTRANSLATED REGION | (TEV) |

Leader

**BCH-GENE-SCBD-103616-4** RBCS TRANSIT PEPTIDE | (GARDEN PEA) |

Transit signal

**BCH-GENE-SCBD-100728-2** DICAMBA MONOOXYGENASE GENE |

Protein coding sequence | Resistance to herbicides

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

Terminator

Notes regarding the genetic elements present in this LMO

#### **Genetic elements associated with PHP19340 and PHP17752:**

Two linear DNA fragments were introduced to the parental soybean (*Glycine max*) line using microparticle bombardment:

- PHP19340A, a 2924 base pair fragment containing *Glycine max* microsomal omega-6-desaturase (FAD2-1) cassette;
- PHP17752A, a 4512 base pair fragment containing the gm-hra (modified soybean acetohydroxy acid synthase (*als*) gene) cassette.

The *fad2-1* cassette is under transcriptional control by the soybean Kunitz trypsin inhibitor gene (KTI3) and the KTI3 terminator. The *fad2-1* fragment present in the cassette corresponds to a 40% of the middle portion of the endogenous gene. The cassette does not code for a protein.

The *gm-hra* cassette contains the coding sequence of *als* under transcriptional control of the soybean S-adenosyl-L-methionine synthetase (SAMS) constitutive promoter the endogenous *als* terminator. The coding sequence of *gm-hra* was produced by optimizing *als*.

#### **Note:**

Four insertions were present in the parental line:

- Insertion 1: one truncated PHP19340A fragment with a truncated KTI3 terminator and intact *fad2-1* fragment and intact KTI3 promoter, one intact PHP19340A fragment, one intact

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PHP17752A fragment, one truncated PHP19340A fragment with an intact KTi3 promoter and a truncated *fad2-1* fragment, and one truncated PHP19340A fragment with a truncated KTi3 promoter and truncated *fad2-1* fragment.

- Insertion 2: one truncated PHP19340A fragment with a truncated KTi3 promoter and with intact *fad2-1* fragment and intact KTi3 terminator.
- Insertion 3: one truncated copy of the KTi3 promoter with a non-functional 495 bp fragment of the plasmid backbone; and
- Insertion 4: two truncated PHP19340A fragments in an inverted repeat configuration, both with a truncated KTi3 promoter and intact *fad2-1* fragment and KTi3 terminator.

#### Genetic elements associated with PV-GMHT4355:

In the parental line (MON87708), an expression cassette for *Stenotrophomonas maltophili* Dicamba monooxygenase (*dmo*) was integrated into the genome. Expression of the *dmo* is under control of the constitutive Peanut chlorotic streak caulimovirus promoter and the *Pisum sativum* Rubisco small subunit 2 (RbcS2 or E9) terminator. The 5' untranslated region from Tobacco Etch Virus was included to enhance translation, as well as the *P. sativum* RbcS2 chloroplast transit peptide to localize the DMO protein to the chloroplast.

Note:

- Southern blot analysis indicated that a single copy of the *dmo* cassette was present in the parental line.
- A second T-DNA with a 5-enolpyruvylshikimate-3-phosphate synthase was bred out of the parental line and thus is not expected to be present in this stacked event.

**For more information, please refer to the parental LMO records.**

## LMO characteristics

### Modified traits

Resistance to herbicides

Sulfonylurea

Changes in quality and/or metabolite content

Lipid and fatty acids

Other

Tolerance to Dicamba (3,6-dichloro-2-methoxybenzoic acid)

### Other gene(s) whose expression was affected by the transformation

[BCH-GENE-SCBD-115046-3](#) OMEGA-6-DESATURASE | (SOYBEANS) |

Protein coding sequence | Changes in quality and/or metabolite content (Lipid and fatty acids)

### How the expression of the gene(s) was affected

Under the control of a seed-preferred KTi3 promoter, transcription of the omega-6 desaturase fragment acts to silence the expression of the endogenous soybean omega-6 desaturase via RNA interference. The reduction in expression of the endogenous gene impedes biosynthesis of polyunsaturated fatty acids. Thus, the fatty acid composition in the soybean seeds is changed (increased proportion of oleic acid and decreased proportions of linoleic and linolenic acids).

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#### Common use(s) of the LMO

Food

Feed

#### Detection method(s)

##### External link(s)

? [DP-305423-1 - EU Reference Laboratory for GM Food and Feed \(EURL-GMFF\)](#) ( *English* )

? [MON-87708-9 - EU Reference Laboratory for GM Food and Feed \(EURL-GMFF\)](#) ( *English* )

#### Additional Information

##### Other relevant website addresses and/or attached documents

? [DP-305423-1 - Pioneer.pdf](#) ( *English* )

? [Dicamba Tolerant MON 87708- APHIS.pdf](#) ( *English* )

[BCH-LMO-SCBD-115048-1](#)

## 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.

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