

Biosafety Clearing-House (BCH)

LIVING MODIFIED ORGANISM (LMO)


BCH-LMO-SCBD-49073-9

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

LAST UPDATED: 12 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
TREUS™ Plenish™ Soybean

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=49073>



Name

TREUS™ Plenish™ Soybean

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Transformation event

305423

Unique identifier

DP-305423-1

Developer(s)

- [ORGANIZATION: PIONEER HI-BRED PRODUCTION INC.](#) | [BCH-CON-CA-16116-1](#)

ORGANIZATION

Pioneer Hi-Bred Production Inc.

Description

The intended effect of the modification in 305423 soybean is to produce soybean seeds with increased levels of monounsaturated fatty acid (oleic) and decreased levels of polyunsaturated fatty acids (linoleic and linolenic). To accomplish this objective, Pioneer inserted a fragment of the soybean microsomal omega-6 desaturase gene (FAD2-1) into soybean. The fragment of the FAD2-1 gene does not code for a protein.

Transcription of the gene fragment under the control of a seed-preferred KTi3 promoter acts to silence the expression of the endogenous soybean omega-6 desaturase, which results in an increased level of oleic acid and decreased levels of linoleic and linolenic acids in the soybean seed. A gene (gm-hra) encoding a modified version of the soybean acetolactate

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synthase (als gene) that confers tolerance to a sulfonylurea herbicide was used as a selectable marker for the transformation.

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-10453-6](#) ORGANISM | GLYCINE MAX (SOYBEAN, SOYA BEAN, SOYA, SOYBN) |
Crops

Characteristics of the modification process

Vector

PHP19340 and PHP17752

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Techniques used for the modification

Biolistic / Particle gun

Genetic elements construct

[P-KTi3](#)
2.084 kb

[FAD2-1](#)
0.597 kb

[T-KTi3](#)
0.196 kb

[P-SAMS](#)
1.300 kb

[CS-ahas-SOYBN](#)
1.970 kb

[T-ahas-SOYBN](#)
0.600 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-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-115046-3](#) OMEGA-6-DESATURASE | (SOYBEANS) |
Protein coding sequence | Changes in quality and/or metabolite content (Lipid and fatty acids)

Notes regarding the genetic elements present in this LMO

Description of the genetic material inserted into event 305423

Microprojectile bombardment was used to co-transform secondary plant cell embryos with two purified linear DNA fragments: a 2924 base pair fragment (PHP19340A fragment)

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containing the gm-fad2-1 cassette, and the 4512 base pair fragment (PHP17752A fragment) containing the gm-hra cassette.

The gm-fad2-1 cassette includes the promoter region from the soybean Kunitz trypsin inhibitor gene (KTI3), a fragment of the FAD2-1 gene that corresponds to approximately 40% of the middle portion of the FAD2-1 gene (597 bp), and the 3' untranslated region of the KTI3 gene (KTI3 terminator).

The gm-hra cassette contains the gm-hra gene (1971 bp), which is an optimized form of the endogenous als gene from soybean, with transcription regulated by the S-adenosyl-L-methionine synthetase (SAMS) constitutive promoter (1.3 kb) from soybean and with transcription terminated by the endogenous als gene terminator (0.6 kb) from soybean.

Sequence characterization of the inserted DNA in 305423 soybean confirms that it contains four insertions that comprise:

- * Insertion 1: one truncated PHP19340A fragment with a truncated KTI3 terminator and intact gm-fad2-1 gene fragment and intact KTI3 promoter, one intact PHP19340A fragment, one intact PHP17752A fragment, one truncated PHP19340A fragment with an intact KTI3 promoter and a truncated gm-fad2-1 gene fragment, and one truncated PHP19340A fragment with a truncated KTI3 promoter and truncated gm-fad2-1 gene fragment.
- * Insertion 2: one truncated PHP19340A fragment with a truncated KTI3 promoter and with intact gm-fad2-1 gene fragment and intact KTI3 terminator.
- * Insertion 3: one truncated copy of the KTI3 promoter with a nonfunctional 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 gm-fad2-1 gene fragment and KTI3 terminator.

The genetic material that is inserted in 305423 soybean is genetically linked and segregates following a typical pattern of Mendelian inheritance expected for a single, genetically-linked insertion locus.

LMO characteristics

Modified traits

Resistance to herbicides
Sulfonylurea
Changes in quality and/or metabolite content
Lipid and fatty acids

Common use(s) of the LMO

Food
Biofuel

Detection method(s)

External link(s)

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

Additional Information

Other relevant website addresses and/or attached documents

? [DP-305423-1 - CERA](#) (*English*)

? [DP-305423-1 - OECD](#) (*English*)

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

? [TREUS™ Plenish™ Soybean](#) (*English*)

[BCH-LMO-SCBD-49073-9](#)

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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