LIVING MODIFIED ORGANISM (LMO)

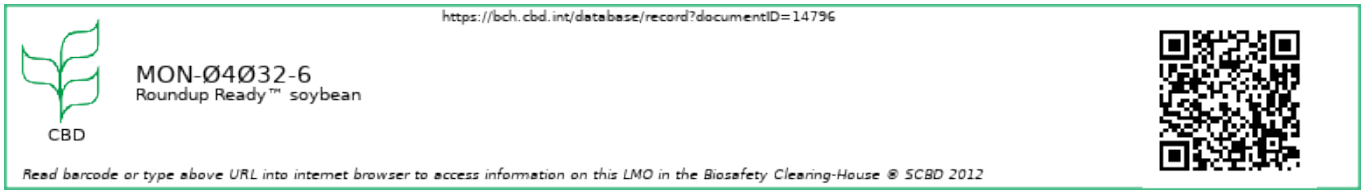
BCH-LMO-SCBD-14796-14

? Decisions on the LMO ? Risk Assessments

LAST UPDATED: 15 DEC 2021

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.



Name

Roundup Ready™ soybean	EN

Transformation event

GTS 40-3-2 (40-3-2)

Unique identifier

MON-Ø4Ø32-6

Developer(s)

- ORGANIZATION: MONSANTO | BCH-CON-SCBD-14925-3

ORGANIZATION

Monsanto
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Description

The soybean line GTS 40-3-2 was developed to allow for the use of glyphosate, the active ingredient in the herbicide Roundup®, as a weed control option. This genetically engineered soybean line contains a form of the plant enzyme 5-enolpyruvylshikimate-3-phosphate synthase (EPSPS) that allows GTS 40-3-2 to survive the otherwise lethal application of	EN

glyphosate. The EPSPS gene put into GTS 40-3-2 was isolated from a strain of the common soil bacterium *Agrobacterium tumefaciens* called CP4 and the form of EPSPS enzyme produced by this gene is tolerant to glyphosate.

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

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

Line: A5403 EN

Characteristics of the modification process

Vector

PV-GMGT04 EN

Techniques used for the modification

Biolistic / Particle gun

Genetic elements construct

P-e35S-CaMV	TP-CTP4-PETHY	CS-CP4epsps-RHIRD	T-nos-RHIRD
0.610 kb	0.230 kb	1.360 kb	0.260 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-14979-7 5-ENOLPYRUVYLSHIKIMATE-3-PHOSPHATE SYNTHASE GENE

Protein coding sequence | Resistance to herbicides (Glyphosate)

BCH-GENE-SCBD-100366-6 CAMV ENHANCED 35S PROMOTER

Promoter

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

Terminator

BCH-GENE-SCBD-103899-3 CHLOROPLAST TRANSIT PEPTIDE 4 | (PETUNIA)

Transit signal

Notes regarding the genetic elements present in this LMO

The plasmid PV-GMGT04 contained three transformation cassettes driven by plant promoters: two *Agrobacterium tumefaciens* 5-enolpyruvylshikimate-3-phosphate synthase (*cp4-epsps)* genes and a gene encoding ß-glucuronidase (GUS) from *Escherichia coli*. Only a portion of this vector was incorporated into event 40-3-2. Southern blot and PCR analysis indicated that only a single transformation cassette containing the EPSPS coding sequence was integrated into the host genome. The largest insert, containing the function CP4 EPSPS gene, contained EN

a deletion in the enhancer region of the E35S promoter and the remainder of the E35S promoter was functional. Analysis also indicated that there was no integration of segments of the vector backbone, the GUS coding sequence or the CmoVb promoter.

The *cp4-epsps* coding sequence encodes a 455 amino acid protein is terminated by tandem stop codons, and results in the synthesis of the full length and functional ~46kDa CP4EPSPS protein in Round-up Ready soybean event 40-3-2 as confirmed by western blotting, enzyme-linked immunosorbent assay and EPSPS enzyme activity assays.

LMO characteristics

Modified traits

Resistance to herbicides
Glyphosate

Common use(s) of the LMO

Feed
Food

Detection method(s)

External link(s)

? MON-Ø4Ø32-6 - EU Reference Laboratory for GM Food and Feed (EURL-GMFF) *(English)*

? MON-Ø4Ø32-6 - CropLife International Detection Methods Database *(English)*

? EUginius - MON-Ø4Ø32-6 *(English)*

? GMO Detection method Database - MON-Ø4Ø32-6 *(English)*

Additional Information

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The EPSPS enzyme is part of an important biochemical pathway in plants called the shikimate pathway, that is involved in the production of aromatic amino acids and other aromatic compounds. When conventional plants are treated with glyphosate, the plants cannot produce the aromatic amino acids needed to grow and survive. EPSPS is present in all plants, bacteria, and fungi. It is not present in animals, which do not synthesize their own aromatic amino acids. Because the aromatic amino acid biosynthetic pathway is not present in mammals, birds or aquatic life forms, glyphosate has little if any toxicity for these organisms. The EPSPS enzyme is naturally present in foods derived from plant and microbial sources.

Other relevant website addresses and/or attached documents

CERA GM Database *(English)*

? MON-Ø4Ø32-6 - Monsanto.pdf *(English)*

? MON-Ø4Ø32-6 - OECD *(English)*

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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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