

Biosafety Clearing-House (BCH)

LIVING MODIFIED ORGANISM (LMO)


BCH-LMO-SCBD-14851-7

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

LAST UPDATED: 30 JAN 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.



ACS-GH001-3
Liberty Link™ cotton

<https://bch.cbd.int/database/record?documentID=14851>



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

Name

Liberty Link™ cotton

EN

Transformation event

LLCotton25

Unique identifier

ACS-GH001-3

Developer(s)

- [ORGANIZATION: BAYER CROPSCIENCE](#) | [BCH-CON-SCBD-7088-7](#)

ORGANIZATION

Bayer CropScience

Website: <http://www.bayercropscience.com>

Description

Cotton tolerant to glufosinate ammonium herbicide produced by inserting a modified phosphinothricin acetyltransferase (PAT) encoding gene (bar) from the soil bacterium *Streptomyces hygroscopicus*.

EN

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-12080-6](#) ORGANISM | GOSSYPIMUM HIRSUTUM (COTTON) |

Crops

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

Variety: Coker 312

EN

Characteristics of the modification process

Vector

pGSV71

EN

Techniques used for the modification

Agrobacterium-mediated DNA transfer

Genetic elements construct

V-RB-RHIRD
0.024 kb

P-35S-CaMV
1.384 kb

CS-bar-STRHY
0.551 kb

T-nos-RHIRD
0.259 kb

V-LB-RHIRD
0.024 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-14972-12 PHOSPHINOTHRICIN N-ACETYLTRANSFERASE GENE |

Protein coding sequence | Resistance to herbicides (Glufosinate)

BCH-GENE-SCBD-101416-6 TI PLASMID RIGHT BORDER REPEAT |

Plasmid vector

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

Promoter

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

Terminator

BCH-GENE-SCBD-101415-9 TI PLASMID LEFT BORDER REPEAT |

Plasmid vector

Notes regarding the genetic elements present in this LMO

The initial two codons of the N-terminal of the bar gene coding sequence were synthetically modified to plant preferred codons.

Southern blot analysis indicated that a single intact copy of the T-DNA was integrated into the LLCotton25 line and no portions of the vector backbone were found in the LMO.

EN

LMO characteristics

Modified traits

Resistance to herbicides
Glufosinate

Common use(s) of the LMO

Food
Feed
Fiber/textile

Detection method(s)

External link(s)

- ? [ACS-GH001-3 - EU Reference Laboratory for GM Food and Feed \(EURL-GMFF\)](#) (English)
- ? [ACS-GH001-3 - CropLife International Detection Methods Database](#) (English)

Additional Information

Additional Information

The cotton line LLCotton25 was developed to allow the use of glufosinate ammonium (trade name Liberty®), as a weed control option in cotton production. The herbicidal mode of action of glufosinate ammonium is related to the activity of glutamine synthetase (GS), the enzyme required for the synthesis of the amino acid glutamine. L-phosphinothricin, the active ingredient of glufosinate ammonium, is a structural analog of glutamate, and acts as a competitive inhibitor. After application of the herbicide, L-phosphinothricin competes with glutamine for its active sites on GS. The results of the inhibition of GS are an accumulation of ammonia in the plant, a reduction in the synthesis of glutamine, and an inhibition of photosynthesis. This causes the death of plant cells, and eventually, the entire plant. This genetically engineered cotton line LLCotton25 contains the bar gene, which codes for the production of the enzyme phosphinothricin acetyl-transferase (PAT). This enzyme acetylates glufosinate ammonium, rendering it inactive in the plant. The expression of the bar gene in LLCotton25 allows it to survive the otherwise lethal application of glufosinate ammonium. The bar gene was isolated from *Streptomyces hygroscopicus*, a gram-positive soil bacterium.

LLCotton25 was developed by *Agrobacterium*-mediated transformation of the cotton variety 'Coker312' with a plasmid vector containing the bar gene. Whole plants were treated with glufosinate ammonium and successful transformants were detected by selecting plants that had not exhibited the phytotoxic effects of glufosinate ammonium.

Other relevant website addresses and/or attached documents

- ? [ACS-GH001-3 - CERA GM Database](#) (English)
- ? [ACS-GH001-3 APHIS.pdf](#) (English)

[BCH-LMO-SCBD-14851-7](#)

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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