



# **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. https://bch.cbd.int/database/record?documentID=14851 ACS-GHØØ1-3 Liberty Link<sup>™</sup> cotton 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<sup>™</sup> cotton EN Transformation event

LLCotton25

Unique identifier

ACS-GHØØ1-3

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 GOSSYPIUM HIRSUTUM (COTTON)

Crops

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

Variety: Coker 312

### **Characteristics of the modification process**

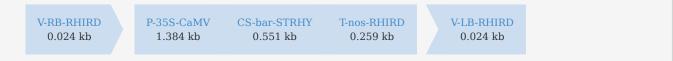
Vector

#### pGSV71

Techniques used for the modification

#### Agrobacterium-mediated DNA transfer

Genetic elements construct



#### 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 Protein coding sequence   Resistar	PHOSPHINOTHRICIN N-ACETYLTRANSFERASE GENE ace to herbicides (Glufosinate)
BCH-GENE-SCBD-101416-6 Plasmid vector	TI PLASMID RIGHT BORDER REPEAT
BCH-GENE-SCBD-100287-7 Promoter	CAMV 35S PROMOTER
BCH-GENE-SCBD-100269-8 Terminator	NOPALINE SYNTHASE GENE TERMINATOR
BCH-GENE-SCBD-101415-9 Plasmid vector	TI PLASMID LEFT BORDER REPEAT

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.

#### LMO characteristics

Modified traits

Resistance to herbicides Glufosinate

Common use(s) of the LMO

ΕN

ΕN

EN

# **Detection method(s)**

External link(s)

- ? ACS-GHØØ1-3 EU Reference Laboratory for GM Food and Feed (EURL-GMFF) ( English )
- ? ACS-GHØØ1-3 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 hygroscopius, 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-GHØØ1-3 - CERA GM Database ( English )

? ACS-GHØØ1-3 APHIS.pdf ( 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. Secretariat of the Convention on Biological Diversity 413 rue Saint-Jacques, suite 800 Montreal, Québec, H2Y 1N9 Canada Fax: +1 514 288-6588 Email: secretariat@cbd.int