

## Biosafety Clearing-House (BCH)

LIVING MODIFIED ORGANISM (LMO)


BCH-LMO-SCBD-14825-7

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

LAST UPDATED: 08 APR 2014


### 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.



**BXN-10222-2**  
BXN™ cotton

<https://bch.cbd.int/database/record?documentID=14825>



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

Name

BXN™ cotton

EN

Transformation event

10222

Unique identifier

BXN-10222-2

Developer(s)

- [ORGANIZATION: MONSANTO](#) | [BCH-CON-SCBD-45397-1](#)

#### ORGANIZATION

Monsanto

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

Description

Cotton tolerant to oxynil herbicides, through introduction of the bxn gene isolated from the bacterium *Klebsiella pneumoniae* subspecies *ozaenae* which codes for the enzyme nitrilase, which hydrolyses ioxynil and bromoxynil into non-toxic compounds. The aphII gene was isolated from the bacterium *Escherichia coli* confers tolerance to the antibiotic kanamycin (used as a selectable marker).

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

Line: Coker 315

EN

Related LMO(s)

**BCH-LMO-SCBD-14823-8** | BXN-10215-4 - BXN™ cotton | Resistance to antibiotics (Kanamycin), Resistance to herbicides (Bromoxynil)

**BCH-LMO-SCBD-14824-7** | BXN-10224-4 - BXN™ cotton | Resistance to antibiotics (Kanamycin), Resistance to herbicides (Bromoxynil)

**BCH-LMO-SCBD-14941-6** | BXN-10211-9 - BXN™ cotton | Monsanto (Calgene) | Resistance to antibiotics (Kanamycin), Resistance to herbicides (Bromoxynil)

## Characteristics of the modification process

Vector

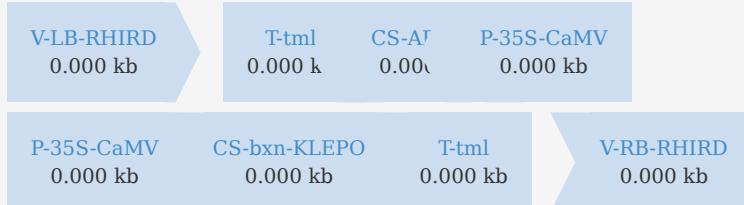
pBrx75

EN

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-14976-5** BROMOXYNIL-SPECIFIC NITRILASE |

Protein coding sequence | Resistance to herbicides (Bromoxynil)

**BCH-GENE-SCBD-14967-2** AMINOGLYCOSIDE 3 PHOSPHOTRANSFERASE II | (BACTERIA) |

Protein coding sequence | Resistance to antibiotics (Kanamycin), Selectable marker genes and reporter genes

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

Plasmid vector

**BCH-GENE-SCBD-104340-2** TUMOUR MORPHOLOGY LARGE GENE TERMINATOR |

Terminator

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

Promoter

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

Plasmid vector

## LMO characteristics

### Modified traits

Resistance to herbicides  
Bromoxynil  
Resistance to antibiotics  
Kanamycin

### Common use(s) of the LMO

Food  
Fiber/textile

## Additional Information

### Additional Information

The BXN™ cotton line was genetically engineered to express tolerance to oxynil herbicides, including bromoxynil and ioxynil. Oxynil herbicides act by blocking electron flow during the light reaction of photosynthesis, inhibiting cellular respiration in dicotyledonous plants. Oxynil herbicides applied at rates recommended for effective weed control are toxic to conventional cotton varieties. The modified cotton line BXN™ contains the bxn gene for oxynil tolerance, and allows farmers to use oxynil herbicides for weed control in the cultivation of cotton.

The bxn gene was isolated from the bacterium *Klebsiella pneumoniae* subspecies *ozaenae* and codes for the enzyme nitrilase, which hydrolyses ioxynil and bromoxynil into non-toxic compounds. The nitrilase encoding gene was introduced into the cotton genome using *Agrobacterium*-mediated transformation, and the bacterial form of the enzyme expressed in this transgenic cotton line functions the same as that found in monocot plants such as corn, wheat and barley.

The kanamycin-resistance gene (aphII), isolated from the bacterium *Escherichia coli* codes for an enzyme (aminoglycoside 3'-phosphotransferase II) that phosphorylates kanamycin, thereby preventing it from binding to ribosomes and rendering the cells resistant. This protein is ubiquitous in the environment and it degrades rapidly in vitro in simulated mammalian gastric and intestinal fluids.

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

- ? [BXN Cotton - CERA](#) ( *English* )
- ? [Canadian Decision Document 98-27: Determination of the Safety of Calgene's BXN™ Cotton \(\*Gossypium hirsutum\* L.\)](#) ( *English* )
- ? [BXN Cotton - ANZFA](#) ( *English* )
- ? [BXN Cotton - APHIS](#) ( *English* )
- ? [BXN Cotton - FDA](#) ( *English* )

## Further Information

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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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