Agrotechnology
ISSN: 2168-9881
OPEN ACCESS Freely available online
Editorial

Genetically Engineered Crops (Bacillus Thuringiensis Crops)

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Bt crops or *Bacillus thuringiensis* crops are transgenic crops. The plant cells of these crops produce toxin similar to that produced by *Bacillus thuringiensis* bacterium. This gives a natural protection of crops from pests.

Plants have been modified with short sequences of genes from Bt to express the crystal protein Bt makes. By the changes of the sequence of genes, plants produce the proteins and protect themselves from insects without any external Bt and/or synthetic pesticide sprays. one protein compound is produces by bacteria that is "cry proteins," that are crystalproteins and it is also called 'cry' proteins. These proteins are poisonousfor the pests. When a pest feeds on Bt crops, the cry protein present in plant cells crystallizes the pest's digestive system and kills it. However, the proteins produce no harmful effect on the digestive system of humans. In 1999, 29 million acres of Bt corn, potato and cotton were grown globally.

BT BACTERIUM

Bt or *Bacillus thuringiensis* is a spore-forming, gram-positive bacterium present in the soil. It is ubiquitous in nature. It produces crystal of endotoxin (cry protein or delta toxin) toxic to insect mainly in their larval stage, thus they act as insecticides. This bacterium is toxic for insect. Farmers practicing organic farming use a solution that contains this bacterium to spray it on their crops as a protective measure against pests.

TYPES OF BT CROPS

Bt Cotton

The Bt cotton variety is genetically transformed with the Bt gene to protect the plants from bollworm, a major pest of cotton. The worms present on the leaves of Bt cotton become lethargic and sleepy and thus, cause less damage to the plants. When the worms consume the plant, the toxic proteins produced by the crops are ingested, thereby, killing them.

Bt Brinjal

Bt brinjal is also produced by genetic transformation of a crystal protein gene cry 1 Ac from the bacterium Bacillus thuringiensis. Bt brinjal was developed to provide resistance against lepidopteron insects. The proteins produced by Btgenes bind to the receptors present on the insect's membrane, resulting in the formation of pores on the membranes. This disrupts the digestive process and leads to the death of the insect.

ADVANTAGES OF BT CROPS

Major advantages of Bt crops are following.

- It helps in improving the crop yield, thereby, raising the farmer's income. This results in increased farm production.
- They help in controlling soil pollution as the use of synthetic pesticides is reduced.
- Bt crops help in protecting beneficial insects.
- It can easily feed an increasing population due to increased yields in a short time.
- It leads to the production of disease-free crops owing to the reduction of pesticides.
- It leads to more productivity in a small area of land.

DISADVANTAGES OF BT CROPS

Bt crops have a few disadvantages.

- Bt crops are costlier than naturally grown crops.
- It can disrupt the natural process of gene flow.
- The pests might become resistant to the toxins produced by these crops and the crop production might decline.

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Received: June 10, 2021; **Accepted:** June 20, 2021; **Published:** June 22, 2021

Citation: Raina SK (2021) Significance of Soil Fertility to Improve Crop Yield. Agrotechnology 10: e137.