

A Review :

Transgenic crops for insect-pests management



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SUMMARY

The indiscriminate use of chemical insecticides create many problems *i.e.* environmental pollution, health hazards, insecticides residues found in agriculture products and their commodities as well as killing of beneficial bio-agents and development of resistance in insects. These problems can be solved by the use of transgenic crop plants. The transgenic plants are made through genetic engineering by means of transferring gene not only from the similar plant species but also from different relatives including non plant species. These are derived from different sources *i.e.* microorganisms, plants and insects. The transgenic crop plants are able to reduce the consumption of synthetic chemical pesticides and thus they protect the environment.

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Key words :

Transgenic crops, Insect pests, Management, Genetic engineering, Bio-agents

Insects have emerged as a major yield-reducing factor for field and horticulture crops. Losses caused by crop pests are greater in the tropics and semi-tropics, which provide ideal conditions for the multiplication and development of insect pests.

Some insects play an important role in maintaining the balance of nature, some feed on plants and animals. Many of them are scavengers and convert the dead plant and animals' tissue into humus and in enrich the soil. Many species of insects live both as parasites and predators on insect pests of crops and help in suppressing their numbers. They also play an important role in increasing the yield of crops.

The transgenic crops are major tool of pest management and play an important role in maintaining the ecological balance and safer crop production.

Genetic engineering and crop pests:

Genetic engineering is highly specialized branch of biotechnology and usually refers to copying a gene for one living organism (plant, animal or microbe) and transfer to another

living organism. Genetic engineering is more powerful than conventional plant breeding. In plant breeding we can transfer gene between close by related species but through genetic engineering, we can transfer the gene not only between the similar plant species but also from different relatives, including non-plant species (Akram *et al.*, 2003).

Sources of transgene preparation for resistant variety against insect:

Microorganism:

- *Bacillus thuringiensis* (Bt. gene)
- Other bacteria

Plant:

- Protein inhibitor (serine, cysteine)
- α Amylase inhibitor
- Plant lecteins

Insect:

- Insect chitinases

Transgene derived from *Bacillus thuringiensis*:

Bt is gram-positive, aerobic, sporulating

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