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FACULTY OF ENGINEERING &
TECHNOLOGY

Course: B. Tech Biotechnology
Sub Code: BBT-515

Semester: 5th
Sub Name: Plant Biotechnology

LECTURE 8

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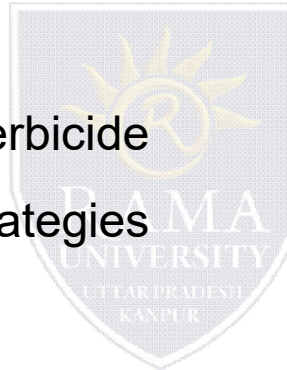
Insect Resistant Plants

- ✓ Bt gene of a bacterium *Bacillus thuringiensis* has found to encode endotoxin which pose cidal effect on certain insect pests
- ✓ The cry gene found to express the proteinaceous toxin, when specific pest ingest the toxin, they are killed.
- ✓ The toxin affect specific group of insects and do not harm silkworm, butterflies and other beneficial insects
- ✓ Using biotechnological approaches many transgenic plants with cry gene have been developed eg., Bt-brinjal, cauliflower, cabbage, canola, corn, maize, tobacco, rice, soyabean



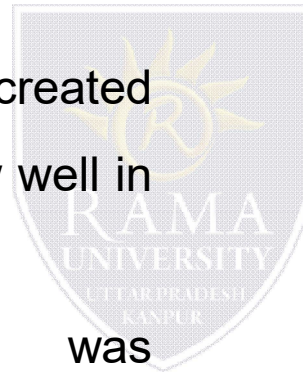
Herbicide resistant plants

- ✓ Plants that can tolerate herbicides
- ✓ The herbicide disturb the metabolic activity of photosynthesis or synthesis of amino acid
- ✓ For the development of herbicide resistant plants two main strategies are being applied
 - Modification of target molecules that may be insensitive to herbicides
 - Degradation of herbicides



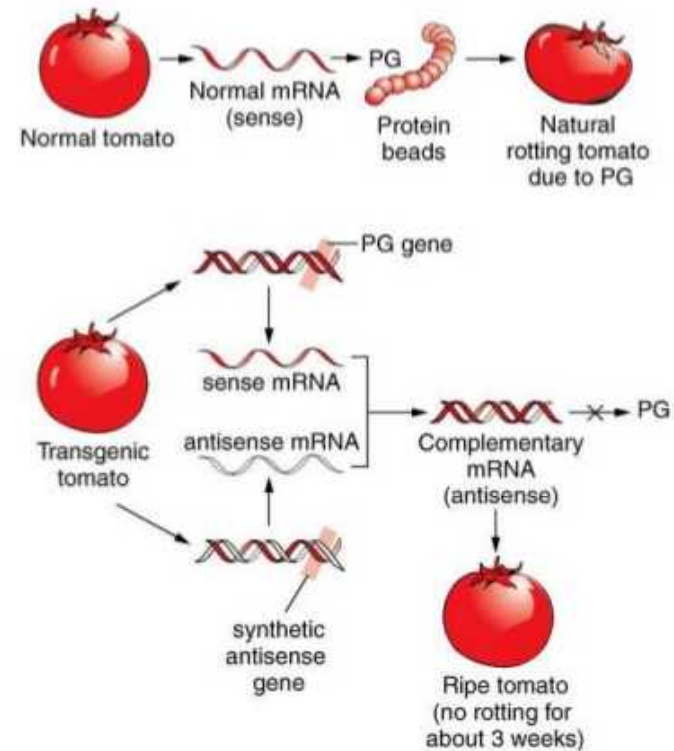
Salt Tolerance

- ✓ A large fraction of world's irrigated land cannot be used to grow most important crops due to increased salinity in soil
- ✓ Researcher's have created transgenic tomatoes that grew well in saline soils
- ✓ The transgene introduced was sodium/proton antiport pump that sequestered excess sodium in vacuole of leaf cells



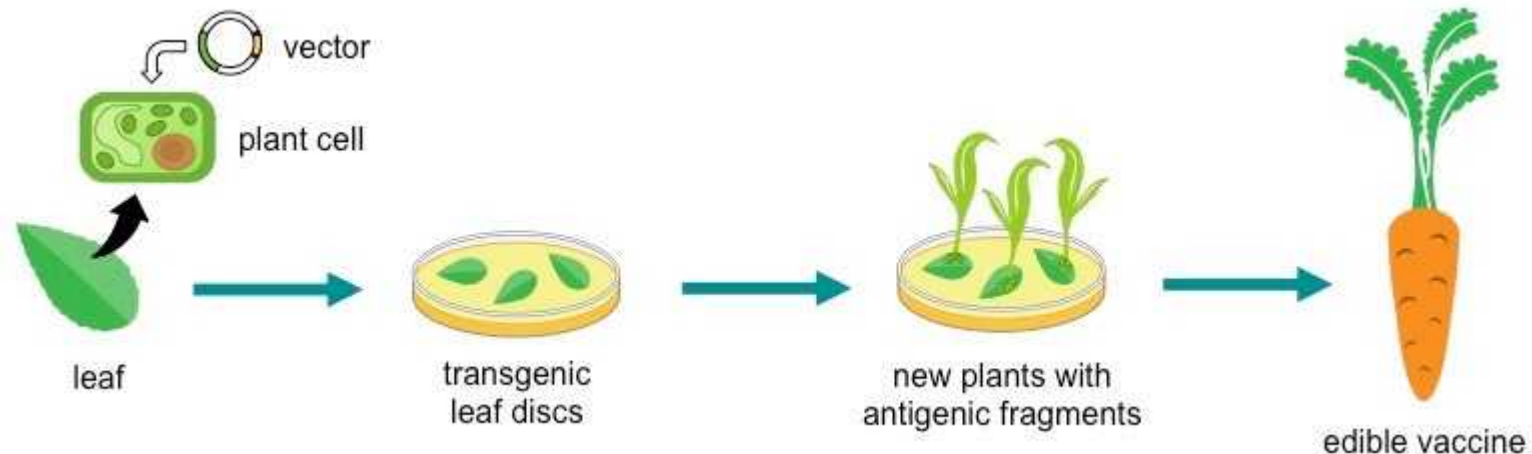
Delayed ripening

- ✓ Antisense technology is used to produce the Flavr-Savr tomato in 1994.
- ✓ Enzyme polygalacturonase breaks down structural polysaccharide pectin in the wall of a plant.
- ✓ This is part of the natural decay process in a plant.
- ✓ Monsanto identified the gene that encodes the enzyme and made another gene that blocked the production of the enzyme.



Pharmaceutical production in plants

- ✓ Genetically modified plants have been used as “bioreactors” to produce therapeutic proteins. A recent contribution is the generation of edible vaccines.
- ✓ **Edible vaccines** are vaccines produced in plants that can be administered directly through the ingestion of plant materials containing the vaccine. Eating the plant would then confer immunity against diseases.
- ✓ Edible vaccines produced by transgenic plants are attractive for many reasons.
- ✓ The first human clinical trial took place in 1997. Vaccine against the toxin from the bacteria *E.coli* was produced in potato.



QUIZ

