

# BIOTECHNOLOGY : APPLICATION-2

## BT COTTON, RNA INTERFERENCE

**XII BIOLOGY**

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## SPECIALLY FOCUSSED GM CROPS

- Insect resistant plant – Bt cotton
- Pest resistant plant – Tobacco plant



**Bt COTTON BALLS**



**TOBACCO PLANT**

## Bt COTTON

- Bacteria used – *Bacillus thuringiensis*
- Gene involved – cry gene
- Crystal Protein-Cry
- It kills certain insects such as :-
  - a) Lepidopterans -- tobacco bud worms, army worms
  - b) Coleopterans -- beetles
  - c) Dipterans -- flies, mosquitoes



CONVENTIONAL COTTON BALLS  
AFFECTED BY WORM

## MECHANISM OF cry gene Activity

- It does not kill the bacterium as it exists as inactive prototoxins.
- Once the insect ingests the prototoxin the inactive toxins is converted into active toxins due to alkaline pH of the gut.



cry gene/Cry PROTEIN  
KILLS THE INSECT



TRANSGENIC Bt COTTON

# PEST RESISTANCE PLANT-TOBACCO PLANT

- Mechanism Involved—RNA interference
- RNAi or silencing a specific m-RNA to form dsRNA, source of the complementary RNA.
- From an infection by viruses having RNA as genome by mobile genetic elements transposons that replicate via an RNA intermediate
- *Agrobacterium tumefaciens* acts as a vector to introduce nematode –specific resistance genes into the host plant.
- Nematode – *Meloidegyne incognita*



