BT COTTON

WHAT IS BT COTTON

- Bt Cotton is a genetically modified organism cotton variety, which produces an insecticide against bollworm. It is produced by Monsanto.
- Bt cotton refers to transgenic cotton which contains endotoxin protein inducing gene from soil bacterium Bacillus thuringiensis.
- The first transgenic plant was developed in 1987 in U.S.A. by Monsanto.

- India ranks no: 1 in the world accounting for 20%of the total area planted under BT cotton.
- Ranks 3rd position with 13% in the production of BT cotton.
- Average yield is only 319 kg/ha as compared to world average of 603 kg/ha.
- Loss due to damage to cotton crop is estimated to be more than Rs.1200 crores/yr

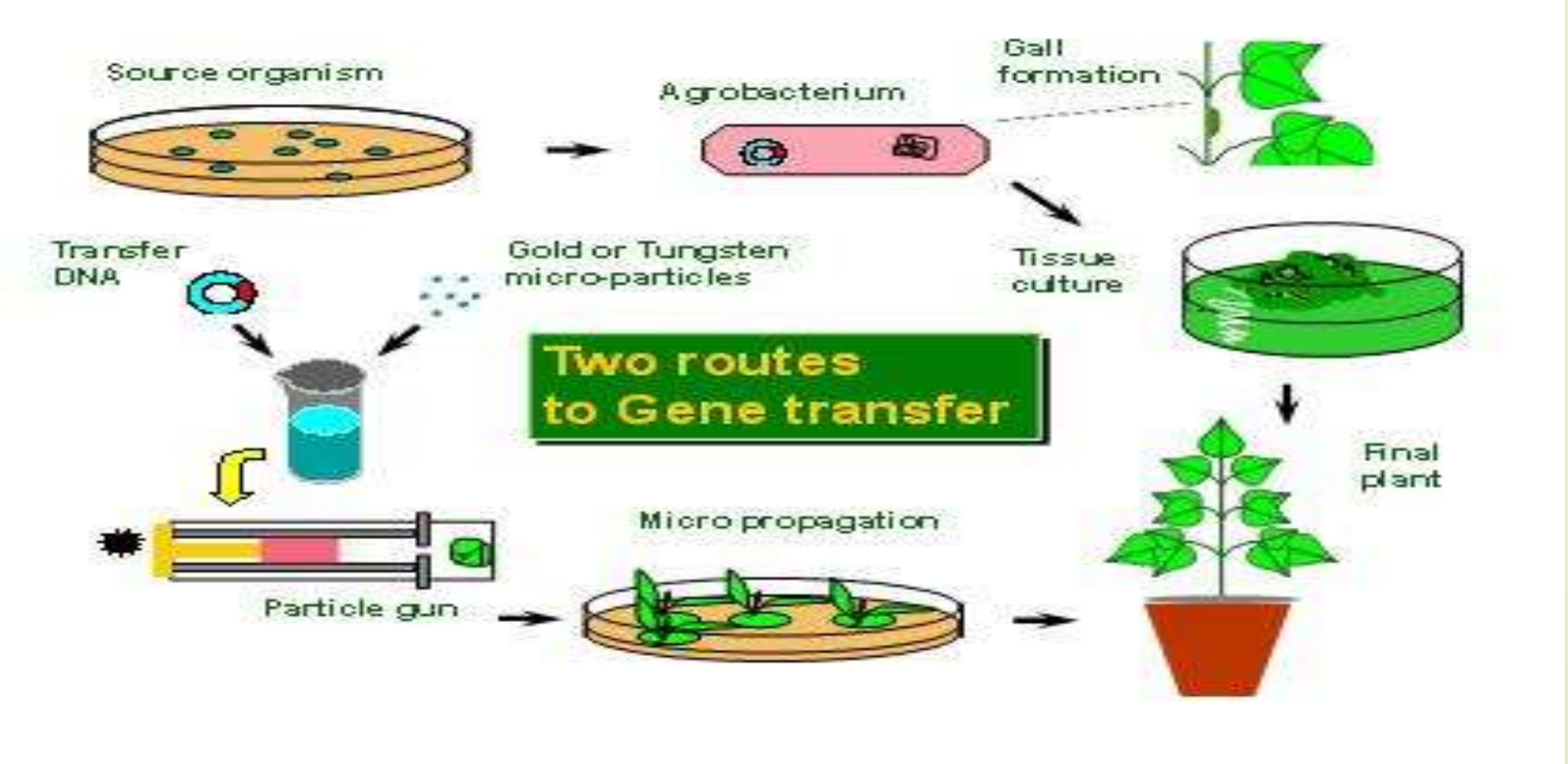
- Cotton is one of the major fibre crops of global significance.
- It is cultivated in tropical and subtropical regions of more than eighty countries of world occupying nearly 33 m ha with an annual production of 19 to 20 million tones of bales.
- China, U.S.A., India, Pakistan, Uzbkistan,Australia, Brazil, Greece, Argentina and Egypt are major cotton producing countries.

Why Bt Cotton?

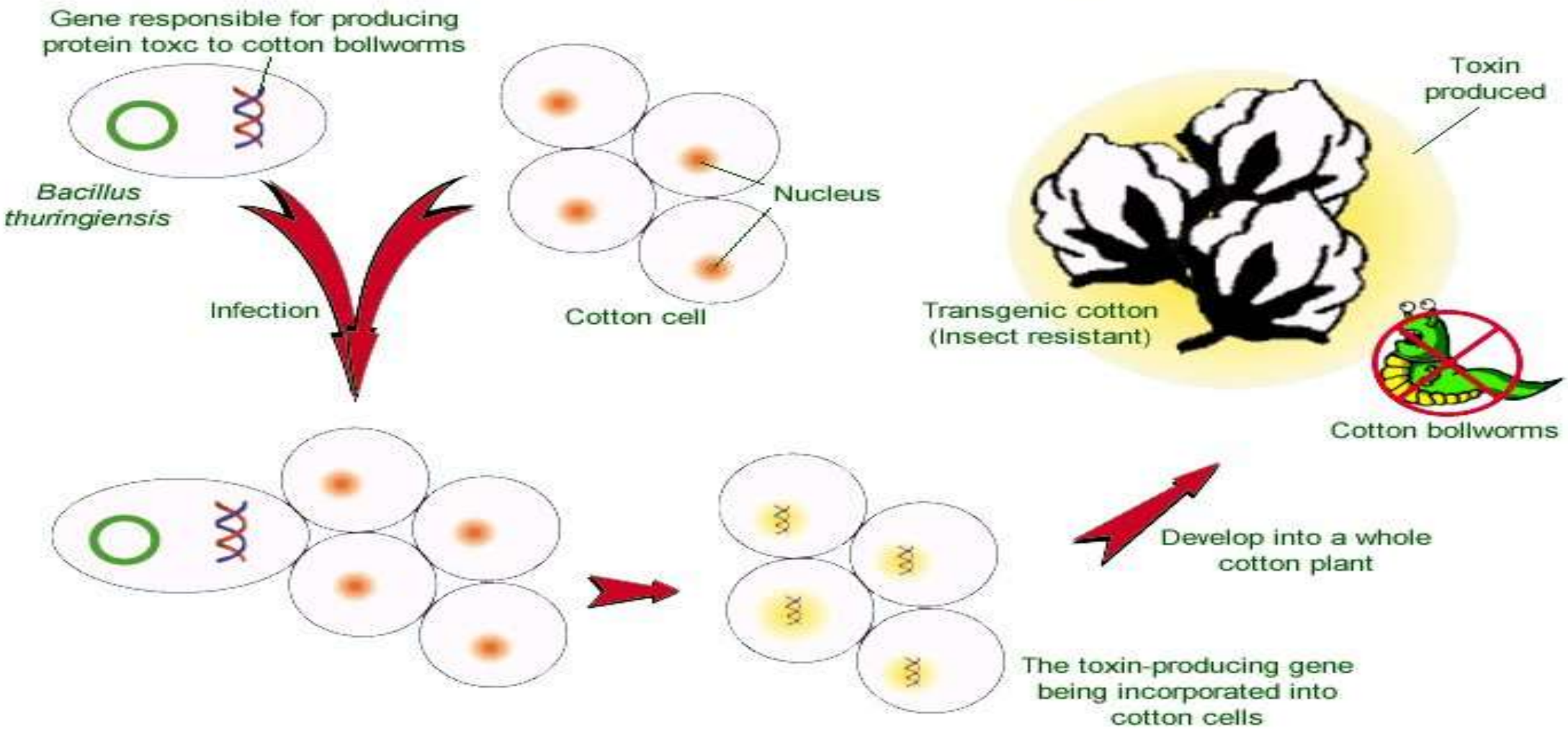
- In India, 162 species of insect pests attack in different stages of cotton.
- Three types of bollwormviz:
- American bollworm (**Helicoverpa armigera**), Pink bollworm (**Pectionphora gossypiella**) and Spotted bollworm (**Earias vitella**), normally referred as bollworm complex are by far the most damaging and loss inducing pests of cotton.
- all over the country causing as high as 80% losses in cotton.

- Transgenic plants contain foreign gene or genetically modified gene of the same species.
- Bt cotton has been genetically modified by the insertion of one or more genes from a common soil bacterium bacillus thuringenesis, these genes encode for the production of insecticidal proteins and thus genetically transformed plants produce one or more toxins as they grow.
- India has bred Bt-cotton varieties such as ***Bikaneri Nerma*** and hybrids such as **NHH-44.**

Bt cotton technology



Production of Insect Resistant Cotton



DIFFERENCE BETWEEN BT COTTON AND COTTON

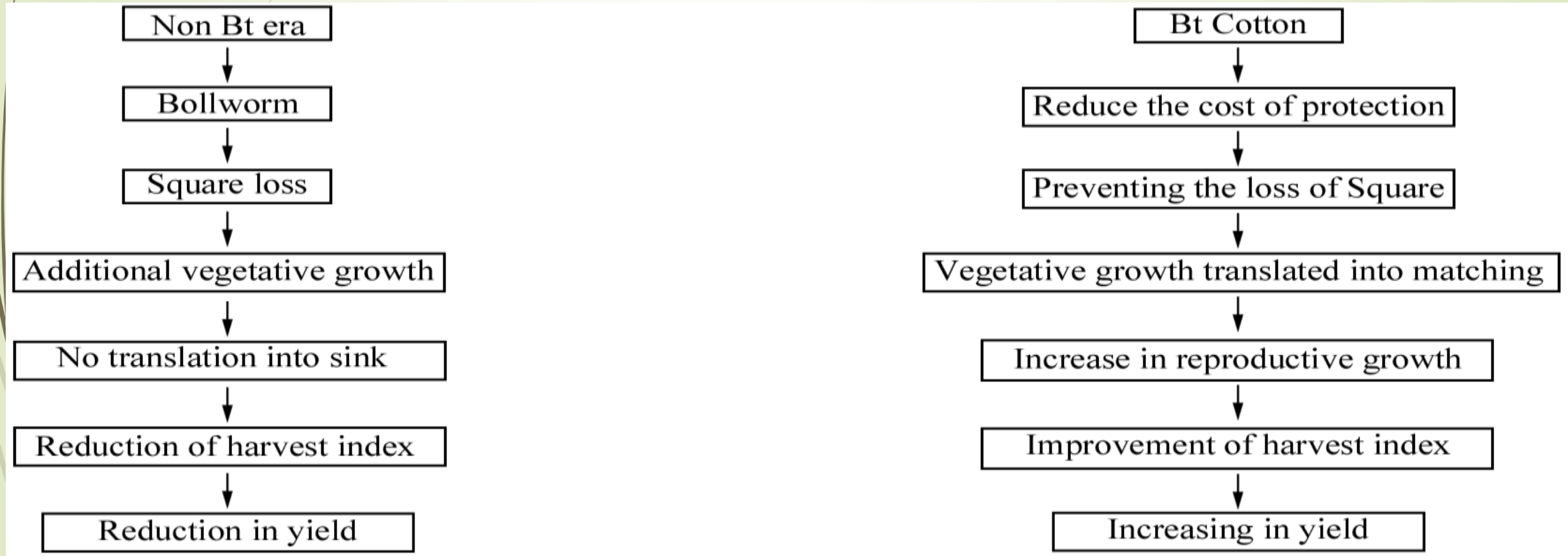
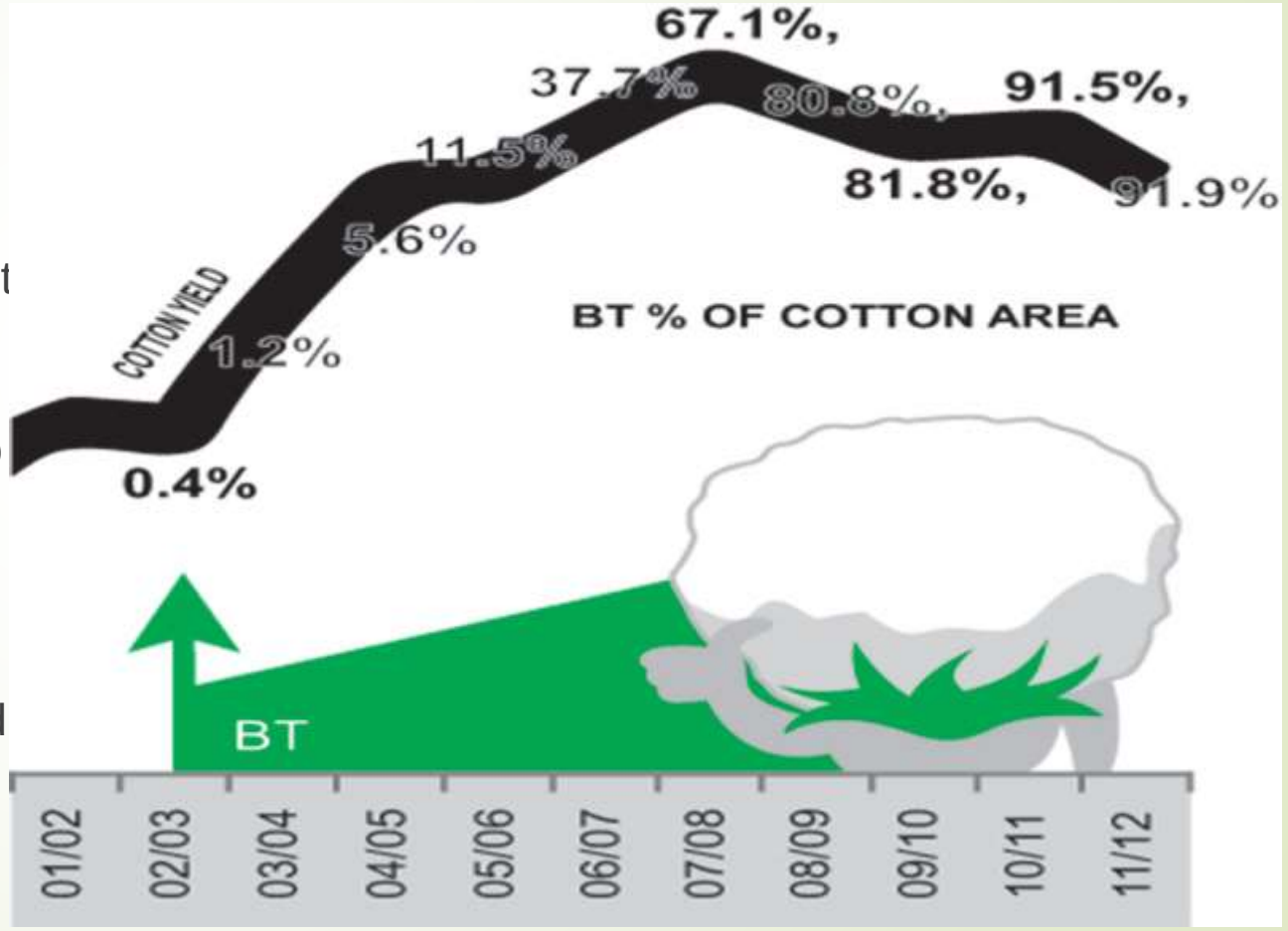


Figure 1 Comparison between Bt cotton and non Bt cotton

- India approved Bt cotton in 2002; now it accounts for 92% of all Indian cotton.
- Average nationwide cotton yields went from 302 kg/ha in the 2002/3 season to a projected 481 kg/ha in 2011/12 — up 59.3% overall.
- This chart shows the trends in yields, which took off after Bt was introduced in 2002 (as we are constantly reminded by GMO enthusiasts).



ADVANTAGE OF BT COTTON

- Increases yield of cotton due to effective control of three types of bollworms, viz. American, Spotted and Pink bollworms.
- Insects belonged to **Lepidoptera** (Bollworms) are sensitive to crystalline endotoxic protein produced by Bt gene which in turn protects cotton from bollworms.
- Reduction in the cost of cultivation and lower farming risks.
- Reduction in environmental pollution by the use of insecticides rarely.
- Bt cotton exhibit genetic resistance or inbuilt resistance which is a permanent type of resistance and not affected by environmental factors. Thus it protects crop from bollworms.

- Bt cotton is ecofriendly and does not have adverse effect on parasites, predators, beneficial insecticides and organisms present in soil.
- It promotes multiplication of parasites and predators which help in controlling the bollworms by feeding on larvae and eggs of bollworm.
- No health hazards due to rare use of insecticides (particularly who is engaged in spraying of insecticides).
- Bt cotton are early in maturing as compared to non Bt cotton.

DISADVANTAGE

- High cost of Bt cotton seeds as compared to non Bt cotton seeds.
- Effectiveness up to 120 days, after that the toxin producing efficiency of the Bt gene drastically reduces.
- Ineffective against sucking pests like jassids, aphids, whitefly etc.
- High cost of seeds.
- Higher fertilizer and irrigation cost.
- Higher harvest cost.

THANK YOU