

Genetic Modification: A Technology That Is Here to Stay®

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BIOTECHNOLOGY

- Biotechnology is applied biology — putting our biological knowledge to work.
- Biotechnology is using any living system to produce something useful.
- Modern biotechnology — various new ways to produce products more efficiently, or to produce new products.

BIOTECHNOLOGY

Present: Proteonomics, metabolomics, and genomics.

Modern:

- Tissue /cell culture: molecular breeding.
- rDNA techniques: diagnostics.
- Gene transfer > genetic modification > microbes, plants, and animals.
- Conventional: selection, breeding, and chemical and radiation mutation.
- Past: bread, beer, wine, vinegar, compost, mining, ethanol, etc.

GENETIC MODIFICATION

- Changing of the genes or genetic material of an organism in ways that do not occur naturally through mating or recombination, or both.
- Often involves inserting genetic material from outside into a cell.
- Results in novel traits in recipient organism.

PRODUCTS FROM GENETICALLY MODIFIED CROP TECHNOLOGY

- More than 40 human health products = hormones, vaccines.
- Scores of unique food processing enzymes.
- Scores of industrial enzymes and microbes.
- Genetically modified plants with insect resistance, herbicide tolerance, virus resistance, longer shelf life, improved nutrition, etc.

GLOBAL STATUS — GENETICALLY MODIFIED CROP

- 1996 = virtually 0.
- 2006 = 102 million hectares.
- 1996–2006 = 577 million ha grown.
- 22 countries.
- > 10 million farmers.
- 90% small-scale farmers.
- > 29 countries registration approvals.
- 107 events, 21 species.

GENETICALLY MODIFIED CROP STATUS — SOUTH AFRICA

- Bt cotton trials 1990, approved 1997.
- Bt + cotton approved 2005.
- Bt maize approved 1998, HT maize approved 2003, Bt + Ht approved 2007.
- Ht soybeans approved 2000.
- Range of genetically modified plants in lab, greenhouse, and field trials.

GENETICALLY MODIFIED CROPS AND THE I.P.P.S.

- In the pipeline:
 - Genetically modified fruit trees, forest trees, ornamentals, pharma plants.
 - Co-existence + identity.
 - Preservation + labeling.

CONCLUSIONS

- Genetic technologies are with us.
- Genetically modified crop varieties have come to stay.
- Promote effective, practical, biosafety legislation.
- Identify your needs.
- Genetically modified traits are only one tool: Use holistic approach and integrated pest management.