

## Objectives and Techniques in Agricultural Biotechnology

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### DESCRIPTION

Nearly half of the Indian population depends on agriculture and related industries for their livelihood, which also significantly contributes to the socioeconomic structure of the nation. India is already self-sufficient in food because to historic increases in agricultural productivity. However, in light of the multilateral issues of a growing population, climate change and its related biotic and abiotic stress factors, declining arable land, and depleting natural resources, sustainable growth in agricultural production and productivity has emerged as a priority concern. Due to complicated problems with hidden hunger, adequate food supply is no longer a reason for complacency, placing a greater emphasis on nutritional security. Despite these difficulties, India has a significant advantage due to its rich biodiversity and growing agricultural demand. Plant biotechnology has proved crucial in increasing crop yield to increase food, feed, and fibre security as well as in lowering agriculture's environmental impact. Quantum advancements in molecular biology, like as genomics, proteomics, and genome technology, present tremendous economic, environmental, and societal prospects for present and future agricultural research.

### Objectives and techniques

Support for basic and applied research to create new products or technologies to minimize the effects of climate change.

- To carry out basic and practical research to enhance the quality, bio-fortification, and yield parameters of important crop plants.
- Analysis/sequencing of native germplasm's genomes and genetic characterization.
- To build infrastructure and educate quality human resources in agriculture biotechnology.
- To develop network initiatives in the agro based research areas.
- To establish Large scale corporate in high-priority crop plants around the nation in accordance with local requirements.

### New initiatives

- Program in mission mode on the "Characterization of Genetic Resources" in distinct crops. The mission mode programme is to sequence/resequence and characterize the phenotypes of the available germplasm resources of cereals (rice and wheat), pulses, and oilseeds (sesame, linseed, safflower, and Niger) (Chickpea).
- "Genetic Enhancement on Pulses" mission programme. Improvements in varieties are planned for productivity and disease/climate resilience.
- Study crop diseases that cause losses in the agriculture sector in terms of both quality and quantity through with a significant network effort on "Pathogenomics of Plant Viruses." Research and development in this area is crucial given the impact of biosecurity on food security.
- National Institute of Plant Genome Research (NIPGR), New Delhi, hosts the National Genomics and Genotyping Facility (Phase I).

There are numerous techniques available to improve and enhance agricultural production. These tools include techniques for creating new types, such as biotechnology and conventional breeding. With growing interest in organic agriculture, a strategy that opposes the use of genetically modified crops, traditional agricultural methods are currently witnessing a slight recovery. Future research on the potential role of genetic engineering in the development of sustainable agriculture appears promising. Major concerns potential hazards are present during the development of any new technology, and agricultural biotechnology is no exception. Before being certified for commercial usage, every crop created by genetic engineering is put through a rigorous safety testing process. Only those of these novel types that have passed risk analyses and are safe for human consumption are made available. Some worries are caused by persons who don't properly comprehend the reporting of risk.

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