



## Transgenic Plants: An Alternate to Traditional Plant Breeding

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With the advancement in technology and research up gradation in biological techniques there comes increased scope in every sphere of life to handle the obstructions wisely and improve the quality of life in every possible way. In the field of biotechnology there exists multiple applications like genetic engineering, micro propagation, bio fuel production, biodegradable polymers etc. but one of the most popular technologies used today is the production of transgenic plants.

Transgenic plants referred most commonly as genetically modified plants are the plants in which the genome or part of the DNA has been modified in order to produce the desired trait in a plant which otherwise does not exist naturally [1].

### Reasons for Transgenic plants

- To improve the quality of the plant or to produce desired characteristics in one plant itself which exists in multiple plants it is possible by the production of transgenic plants.
- To transfer the genes from unrelated plant species it is impossible to perform in traditional plant breeding, but it is comparatively easily and fast process through the biotechnology technique.
- This technology is useful for the isolation of the genes from any plant species and controlling and modifying the same in the desired manner [2].

### Phases in production of transgenic plants

The process in the production of transgenic plants is given in the flowchart.

The above diagram shows the various steps which should be followed in order to have a transgenic plant. Firstly, the gene needs to be identified and the process of isolating that gene should be done cautiously. Secondly the gene should be made in order to load the gene of interest into the same. Thirdly the gene construct containing the desired gene is placed in the cell or tissue of the plant and are made to grow in environment controlled conditions.

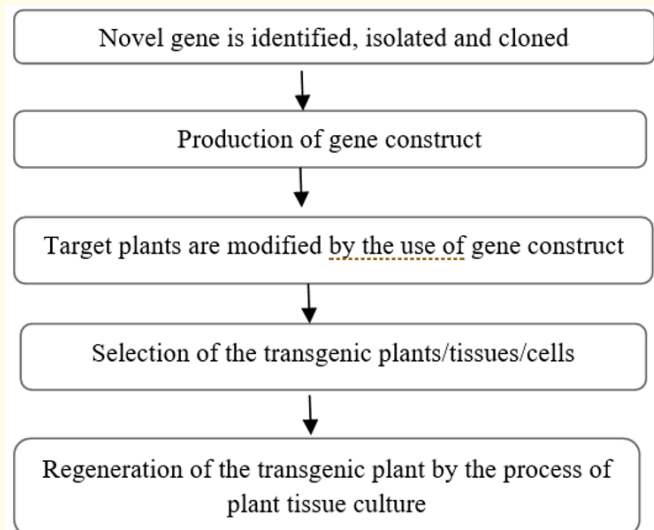


Figure 1: Phases in the production of transgenic plants [3].

Lastly the regeneration of the transgenic plant is done in order to more plants with the desired genes.

### Applications of the transgenic plants

- Nutritional quality of the crops improved considerably.
- The plants are insect and disease resistant, so it led to less wastage of the crops.
- The plants which were not able to grow in salty areas became salt tolerant thus were able to produce in the salty areas too which form most of the land in the world.
- Biopharmaceuticals: the modified plants are used to even produce medicines and proteins like antibodies, human growth hormone, etc. have been to produce through them.

### Future of transgenic plants

The advancement in technologies in the biotechnology research and development area are increasing at a high rate and this will be leading to [4].

- Increased and effective transformation.
- Antibiotic genes will be replaced by the advanced marker genes.
- The gene expression will be controlled in a better way by usage of more specific promoters.
- The gene will only be active when and where needed i.e. more efficient.

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