High Yield Hints – Transgenic organisms

Transgenic organisms

Organisms that has become transformed following the introduction of new DNA into its genome is called transgenic organism. Transgenic crop plants contain a gene or genes which have been artificially inserted instead of plant acquiring them through pollination. The inserted gene sequence is called Transgene may come from another unrelated plant or from a completely different species. For example, Bt Corn with gene from Bacillus thuringienesis, resistant to over ripening of Tomato.

Transgenic animals have novel genes obtained from outside. For example, Plasminogen activator in milk (Goat). Transgenic microbes are being used in industry for producing different bio chemicals and various functions. For example, Pseudomonas putida has been changed by introducing Plasmids of different strains for Alcoholic fermentation.

Bt Cotton, a transgenic crop variety, have been introduced in India. The Bt cotton variety contains a foreign gene obtained from Bacillus thuringienesis. This bacterial gene, introduced genetically into the cotton seeds protect the plant from Bollworm, a major pest of cotton. Bt cotton requires only 2 sprays of pesticide while the normal variety requires 8 sprays. According to Indian Council of Agricultural Research (ICAR), India uses about half of its pesticides on cotton to fight against Bollworm menacle. Use of Bt cotton has led to a 3% - 27% increase in cotton yield in countries where it is grown

Gene transfer techniques

Used to transfer genes from one organism to another

1. Agrobacterium mediated gene transfer
2. Direct gene transfer using Biolistic gun, Electroporation , Microinjection etc.

Trangenic plants

The plants which carry additional stably integrated and expressed foreign genes transferred from other genetic sources are called as transgenic plants.

Agrobacterium mediated transfer

The most common techniques used to transfer genes to Dicotyledonous plants using Agrobacterium. Cereals are difficult to transform through Agrobacterium because they do not have the proper wound response, a necessary requirement for transformation.

Transgenic vegetables

First transgenic plant	Flavr Savr- delayed ripening tomato – introduced by Calgene Inc. USA in 1994.
Cherry, Endless summer (tomato) – contains Bt protein gene against fruit borer.	
Freedom II	Squash resistant to water melon mosaic virus
New leaf (Potato)	resistant to Colorado beetle (Leptinotarsa decemlineata)
AmAl	Amaranth
Parthenocarpy fruits	Seed less fruits
Golden rice	With high Vit. A content