



Prospects of transgenic technique for the improvement of vegetables

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INTRODUCTION

Genetic engineering is the most potent biotechnological approach for the transfer of specially constructed gene assemblies through various transformation techniques. Development of transgenic crops during the 1990's is an important landmark in the history of crop improvement. Since the first commercial release in 1994, transgenic crops have registered a steady increase in area (67.7 million ha, 2003) and have slowly spread across nations (18 countries) (James, 2003). A 'transgenic' plant contains a gene or genes that has been artificially inserted. Transgenic plants are also called as 'genetically modified' (GM) crops. The inserted gene sequence is known as the 'transgene'. It may come from an unrelated plant, or from a completely different species. 'Transgenic technology refers to the technique capable of transferring genes from donor organisms to recipient organisms without the involvement of sexual reproduction between them (Rissler and Mellon, 1996). The global area under the cultivation of transgenic crops has increased from 1.6 million ha in 1996 to 81.00 million ha in 2004. The first, and as yet the only transgenic crop permitted for the commercial cultivation in India is cotton, for bollworm resistance, popularly known as Bt cotton (Rai, 2006).

Applications of transgenic technology:

- For Herbicide resistance : e.g. Plants have been

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Few milestones in the history of transgenics

1953	-	Watson and Crick determine the double helix structure of DNA.
1970	-	Recombinant DNA technology developed.
1983	-	Foreign gene inserted into tobacco (First transgenic plant).
1991	-	Foreign gene inserted into petunia (First transgenic ornamental).
1994	-	Calgene's Flavr savr transgenic tomato approved for sale in the United States.
1996	-	U.S. market introduction of transgenic corn, cotton and soybean : 3 million acres planted. Market introduction of transgenic carnation in Australia.
1998	-	More than 700 requests to move, import or field release transgenic plants approved.
2002	-	Bt-Cotton was released for commercial cultivation in March in India.
2006	-	(24 th Sept.) Indian Government brings a stay on the trials carried out on GM plants.

obtained tolerant to herbicides like glyphosate, sulfonyleurea and imidazolinones.

- For disease resistance.
- Virus resistance.
- Fungal resistance.
- Bacterial resistance.
- Insect pest resistance.
- For obtaining parthenocarpic plants.
- For improving the post harvest traits.
- For obtaining male sterile plants.
- For development of vaccines.

(Source : ISVS Souvenir : Silver Jubilee National Symposium, Dec.1998.)