Application of antisense technique in genetic engineering for improving horticultural crops

Z. Zamani

Faculty Member of Horticulture Department, Faculty of Agriculture, University of Tehran

Genetic engineering is one of promising hopes for genetic improvement of plants. Its use is a good way for solving problems such as restricted genetic resources or addition of unwanted genes during traditional plant breeding.

Antisense technique is one of the methods in genetic engineering being useful in removing some of problems in horticultural plants. In this method, a reversed copy of a defined gene is inserted into the genome of the plant, which causes reduction or prevention of expression of that gene. This technique has been used for reduction of expression of many genes in plants. Some of these genes are responsible for enzymes such as polygalacturonase in tomato, ACC synthase and ACC oxidase in tomato and carnation and some other plants and polyphenol oxidase in potato. These have been effective respectively for prevention of softening of tomato fruit, delay in ripeneing of tomato or senescence of carnation flowers and prevention of discoloration of potato tubers after cutting.

In this experiment antisense of ACC oxidase gene from apple fruit has been used for transformation of apple with the aim of increasing the post-harvest life of apple cv. Red Delicious. Expression of the antisense gene in vegetative tissues has been assessed and for evaluation of its effects on apple fruit the experiments are underway.