

Title Chemical and molecular genetic strategies to block ethylene perception for increased flower life

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Abstract

Ethylene has been known to cause many undesirable effects in a range of ornamental species. Blocking ethylene responses has been proved as an efficient strategy to enhance the longevity of the flowers. The most effective ways to conduct such interference are using chemical compounds or genetic manipulation. In the last 15 years a large number of volatile chemical compounds have been evaluated for their effects on ethylene production and perception. This has resulted in the discovery that cyclopropenes effectively block ethylene responses at the receptor level. The most promising among them are 1-methylcyclopropene (1-MCP) and a number of other substituted cyclopropenes. A lot of testing remains to be done to uncover the full potential of these compounds, but they do offer promising new ways to improve the postharvest quality and longevity of ornamentals. Another very effective way for controlling ethylene synthesis and perception is genetic modification. The most promising strategy seems to be the use of the mutant ethylene receptor gene, *etr1-1*, from *Arabidopsis thaliana*, especially when it is expressed under the control of a flower specific promoter.