

Title Ethylene and anti-ethylene technologies in lilies
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Abstract

Ethylene is a gaseous plant hormone that accelerates ripening in many fruits and vegetables, and causes senescence in many ornamentals. Lilies are known to be sensitive to ethylene during plant growth, and previous research has shown that long-term (e.g., many weeks) exposure to as little as 0.05 to 0.1 ppm can lead to stunted plants with no market value. Higher concentrations over shorter periods can also injure growing plants. To better understand ethylene effects in lilies, studies were conducted with two Asiatic hybrid lily cultivars ('Orange Pixie' and 'Pink Pixie') and *L. longiflorum* 'Nellie White'. When hybrid lilies (at visible bud stage or ca. 2 weeks later) were exposed to 0.25 or 0.75 ppm ethylene for 1 to 7 days (20°C, in darkness), no injury occurred with 1 day of exposure, but nearly 100% flower abortion was seen with 4 days exposure. Similar results were seen with 'Nellie White' with 1 ppm ethylene. Injury was highly dependent on bud size, with buds less than ca. 3 cm being susceptible to 1 day of ethylene (Asiatic hybrid cultivars) and less than ca. 4 cm ('Nellie White'). The ethylene perception inhibitor, 1-methylcyclopropene (MCP) was highly effective in protecting plants against ethylene. When applied as a foliar spray, MCP at concentrations of 10-50 mg/L (active ingredient) fully protected plants against a 4-d treatment with exogenous ethylene. Initial results using ethephon (an ethylene releasing chemical) as a potential growth regulator for height control in Oriental hybrid lilies are presented.