Ethylene responses in three Hydrangea lines

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Acta Horticulturae 1060: 39-46. (2015)

Abstract

The ornamental scrub *Hydrangea* is generally not considered to be particularly sensitive to the phytohormone ethylene. The present study aimed at testing ethylene sensitivity in three different *Hydrangea* lines: 1, 2 and 3 taking into account the effect of temperature. Ethylene response was measured as leaf epinasty and leaf drop. Data indicated that higher temperature accelerates the effect of 2 µl L^{-1} ethylene over a 12-day period, and if the inhibitor 1-methylcyclopopene 1-MCP is able to attenuate this effect. Breeding line 1 and 3 dropped 3.8±0.6 and 5.0±0.4 leaves on average, respectively, during the 12-day experimental period. Non-treated controls of line 1 and 3 dropped 1.8±0.6 and 1.8±0.4 leaves, respectively. In contrast, line 2 did not show a significant response to ethylene treatment with a leaf drop of 2.1±0.3 leaves, compared to a leaf drop of 0.8±0.3 in non-treated controls. Furthermore, the type of response between the lines varied. Line 2 was prone to have higher epinasty/leaf drop ratio, compared to line 1. Interestingly, the data indicated that ethylene had a flower inducing effect on 180-day sold plants with an acceleration of up to 30 days, compared to controls. 90-day-old plants treated with ethylene did not show decreased time to flower. This suggests that an age and developmental threshold exists for an initiation of flower development utilizing ethylene in *Hydrangea*. It is likely that the 90-day-old plants were not yet competent for the flower evocation signal, whereas the apical buds of the 180-day-old plants had undergone the required developmental processes making them competent.