

Title Effects of ethylene on volatile emission and fragrance in cut roses: The relationship between fragrance and vase life

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Abstract

The relationship between fragrance and vase life and the role of ethylene on volatile emission in cut rose flowers was investigated. No relationship was observed between the amounts of volatile compounds emitted and vase life when fragrant and non-fragrant rose cultivars were compared. Neither ethylene production nor respiration rate of flowers was directly related with vase life. Volatile production during vase life was differential and independent among volatiles originating from different biosynthetic groups. Ethylene did not play a role in the regulation of volatile emission in rose flowers. Endogenous ethylene production was very low in most of the cultivars and did not show autocatalytic production trends. Volatile emission patterns during vase life did not parallel endogenous ethylene production. Exogenous ethylene exposure had differential effects among all cultivars, regardless of the fragrance of the flower. Fragrant cultivar 'Osiana' was highly sensitive to exogenous ethylene, with petals abscising within 24 h of ethylene ($1 \mu\text{L L}^{-1}$) exposure while other fragrant cultivars 'Erin' and 'Lovely Dream' had low ethylene sensitivity. Volatile production was unaffected by exogenous ethylene. The results of this study indicate that volatile emission in cut roses is not regulated by endogenous or exogenous ethylene and occurs independently of petal senescence and/or abscission. These results provide a better understanding of the complexity of volatile emission in rose flowers.