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## Roses are Ethylene-Sensitive

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### Introduction

Roses are sensitive to improper storage and shipping temperatures, microbes in hydration and vase solutions, and other handling practices that damage flower quality. Roses are also ethylene-sensitive. Reports during the last 20 years have shown that flowers open abnormally following external ethylene exposure. However, flowers also produce ethylene internally when exposed to high temperatures, water stress and extended storage and shipping. The extent of the problem and the symptoms of ethylene damage have not been well documented. As a result, problems caused by ethylene on roses may be overlooked or attributed to other factors.

More than 38 varieties of roses from commercial growers in Colombia and Ecuador were shipped by air to Miami and delivered by refrigerated truck to the University of Florida for ethylene treatment and postharvest evaluations. Upon arrival, the flowers were hydrated in a commercial hydration solution then transferred to a commercial flower food. Then, half of the flowers were treated with EthylBloc™ Technology or Silver Thiosulfate according to label recommendations; the other half remained untreated. Flowers in both groups were exposed to ethylene gas for 24 hours before being placed into postharvest rooms at 70° F and 50% humidity and fluorescent lighting (70 ft-c. for 12 hours daily) for evaluation.

### Ethylene Damage Symptoms Affect Varieties in Different ways

Twenty-seven of the varieties tested (71%) were sensitive to ethylene. Exposure to ethylene reduced vase life by 18 – 47%. Petal wilting was accelerated following treatment with ethylene (Figure 1). In some varieties, such as 'Osiana' and 'Freedom,' petal and leaf drop resulted from the ethylene treatment (Figures 2 and 3). Failure of flowers to open following ethylene treatment was observed in 63% of the sensitive varieties (Figure 4).

### EthylBloc™ and Silver Thiosulfate Treatments Prevent Damage

EthylBloc™ Technology and Silver Thiosulfate (EthylGuard) prevent the production of ethylene by flowers and reduce the sensitivity of flowers to external ethylene sources such as decaying fruits and vegetables and combustible engines. Ethylene—whether internal or external—is equally damaging to roses. Roses treated with EthylBloc™ and Silver Thiosulfate were not damaged by exposure to ethylene (Figure 5).



Figure 1. Premature wilting of N'Joy Roses. The vase to left is the control and the vase to the right is ethylene-exposed.



Figure 2. Petal drop in Osiana Roses



Figure 3. Leaf drop in 'Freedom' Roses

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Figure 4. Failure of flowers to open in 'Movie Sta' roses. The vase to left is the control and the vase to the right is ethylene-exposed.



Figure 5. 'Freedom' roses treated w/ EthylBloc™ (left) were not affected by ethylene while leaf drop occurred when flowers were not treated with EthylBloc™ (right)

## Conclusion

While some varieties of roses are negligibly affected by ethylene, a majority of the cut rose cultivars grown today are ethylene-sensitive. Premature petal wilting, reduced vase life and flower opening, and leaf and petal drop occur as a result of ethylene exposure. Growers can limit and/or prevent ethylene damage by growing ethylene-resistant varieties or by treating roses with either EthylBloc™ or EthylGuard 100, a silver thiosulfate product. To assure optimal quality and vase life, wholesale florists, retail florists and mass-market buyers should require all roses to be treated with EthylBloc™ or EthylGuard 100.

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For additional information:

Macnish, Andrew J., Ria T. Leonard, Ana Maria Borda and Terril A. Nell. 2010. Genotypic Variation in the Postharvest Performance and Ethylene Sensitivity of Cut Rose Flowers. *HortScience* 45: 790 – 796.

Macnish, Andrew J., Ria T. Leonard and Terril A. Nell. 2011. Strategies for Protecting Cut Rose Flowers Against Ethylene. Floraculture International.

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