

Research Progress Report on:

# **ETHYLENE TOLERANCE OF HYBRID LILIES**

Submitted by:  
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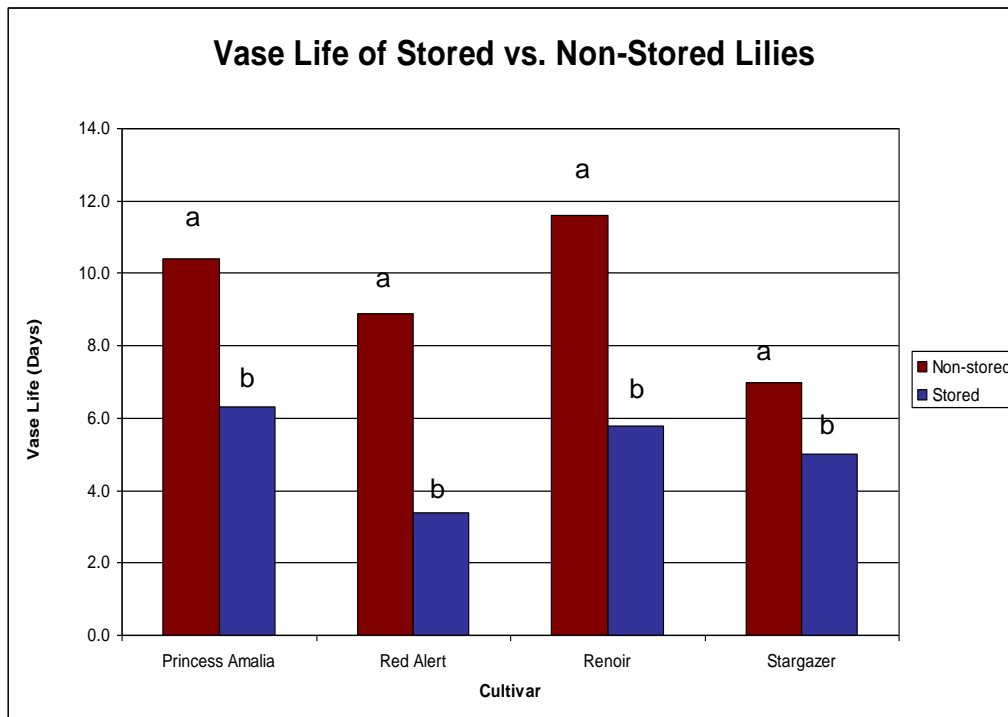
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**Summary:**

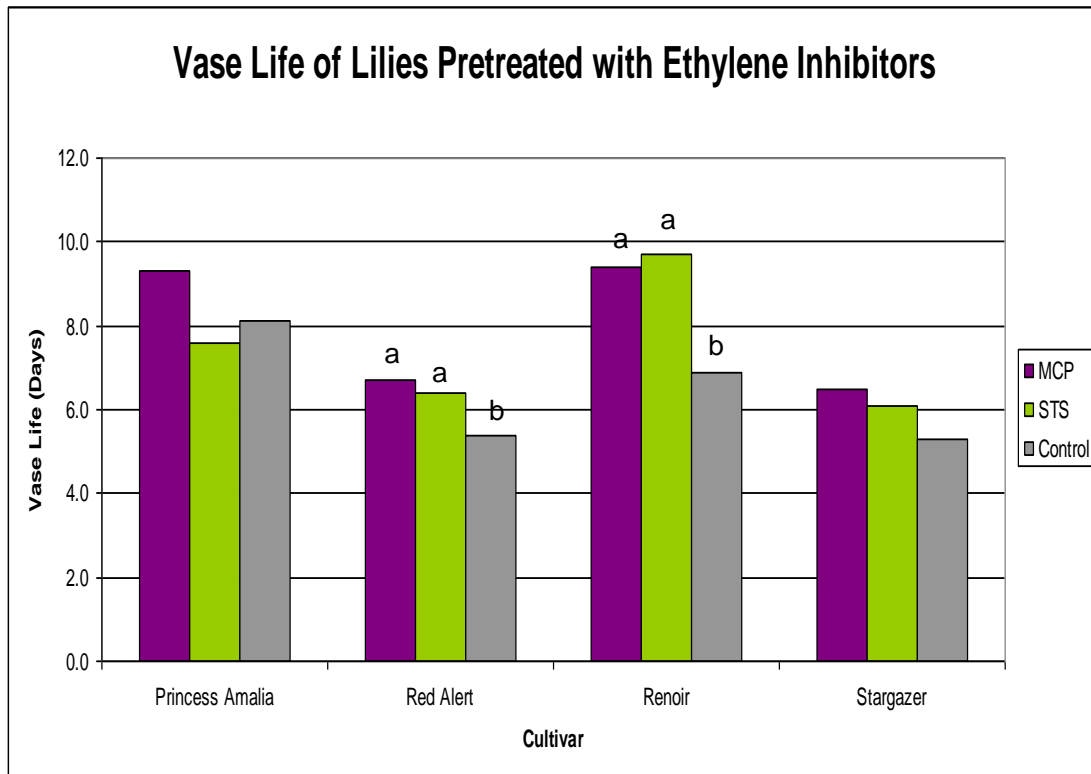
Previously, we described production conditions for four hybrid lily varieties, L.A. *Lilium* ‘Princess Amalia’, L.A. *L.* ‘Red Alert’, Asiatic *L.* ‘Renoir’, and Oriental *L.* ‘Stargazer’. Due to lower than average light levels, high levels of bud abortion occurred on ‘Princess Amalia’.

Statistical analysis revealed that vase life depended on an interaction between storage and cultivar, while ethylene exposure and pretreatment with 1-MCP or STS affected vase life with no interactions with any other factors. Because of the added complexity the interaction between storage and cultivar, we chose to analyze the data for each cultivar separately.

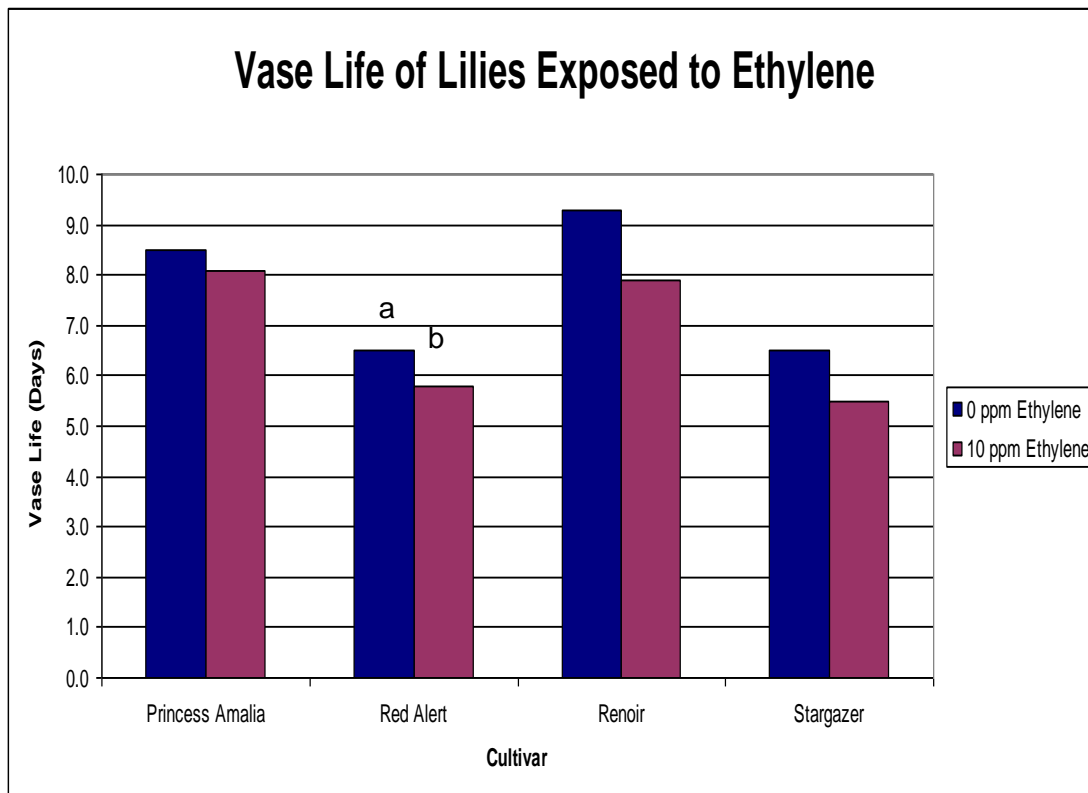
For each cultivar, storage decreased vase life; however, this effect was least pronounced in ‘Stargazer’ and most pronounced in ‘Red Alert’ (Figure 1). Treatment with 1-MCP or STS increased vase life above the control in ‘Red Alert’ and ‘Renoir’ (Figure 2); traditionally, growers have preferred STS above 1-MCP, so further research into the difference between the efficacy of the two may be warranted as 1-MCP is less toxic and has fewer environmental concerns than does STS. Ethylene exposure was linked to a statistical difference only in ‘Red Alert’.



**Figure 1.** Effect of wet storage at 4° C for two weeks on vase life of cut *Lilium*. Storage decreased vase life in each cultivar.



**Figure 2.** Effect of treating with 1-MCP and STS on vase life of cut *Lilium*. 1-MCP and STS increased vase life in 'Red Alert' and 'Renoir' but did not have an effect for the other two cultivars. There was not a difference between 1-MCP and STS for any cultivar.



**Figure 3.** Effect of 18 hour ethylene exposure on vase life of cut *Lilium*. ‘Red Alert’ vase life was decreased by ethylene exposure while statistical analysis did not reveal a difference for the other three cultivars.

Both ‘Red Alert’ and ‘Renoir’ had increased vase life when treated with 1-MCP or STS but only ‘Red Alert’ showed a decrease in vase life when exposed to exogenous ethylene. This leads us to speculate that, for ‘Renoir’ at least, endogenous ethylene production causes a decrease in vase life and that 1-MCP and STS were able to protect from endogenous ethylene damage.

As of June 30, 190 of approximately 240 samples have had carbohydrates extracted for high performance liquid chromatography (HPLC). Sixty-eight samples have been run by HPLC, although a few may need to be re-done. Starch hydrolysis has not yet been started.

#### Change to methods from original proposal

- 100 mg of freeze dried pulverized tissue was extracted with 9 ml total volume ethanol (3 ml each over three suspensions) and 1 ml 0.1098 M sorbitol.