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Vase Life Evaluation of Field-grown *Lilium* Hybrids under Shade Cloth

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INTRODUCTION

The challenge for Texas specialty cut flower growers is to produce high quality flowers over an extended growing season while dealing with extreme environmental conditions that usually limit production. However, it is a challenging for them to produce high quality field grown lilies during the summer and fall because of the extremely high temperature and light intensity.

Vase life performance of *Lilium* hybrids was evaluated from a field study designed to evaluate the growth and development of *Lilium* hybrids treated with natural full sun (NFS), 50% black shade cloth (BSC) and 50% aluminet shade cloth (ASC). Lily bulbs were planted monthly from April to August in 2013 in raised bed at Stephen F. Austin State University, TX. Lily cultivars were selected from Asiatic, Oriental, Longiflorum-Asiatic (LA) and Oriental-Trumpet (OT) hybrids (Table 1).

Table 1. Lilium hybrid, cultivar, bulb size, color typical number of flower buds, plant height, and forcing time used in experiment.

Hybrid	Cultivar	Bulb Size (cm)	Color	Number of flower buds No.	Plant Height (cm)	Forcing Time (days)
Asiatic	'Black Out'	12/14	Dark Red	3-6	90	80
	'Brunello'	12/14	Orange	4-6	95	85
	'Gironde'	12/14	Yellow	4-7	90	90
LA	'Dazzle'	14/16	Yellow	5-8	100	90
	'Samur'	14/16	White / Pink	3-5	85	85
	'Royal Sunset'	14/16	Yellow / Orange	4-6	95	85
Oriental	'Sorbonne'	16/18	Pink	3-6	100	100
	'Crystal Blanca'	16/18	White	3-7	110	115
OT	'Yelloween'	16/18	Yellow	3-6	130	90
	'Gluhwein'	16/18	Salmon	3-5	120	90

Source: Zabo Plant official website (http://www.zaboplant.nl/)

MATERIALS & METHODS

Twelve flower stems from each cultivar were harvested prior to anthesis and randomly placed in four solutions: 1) 12 mg·L-1 sodium hypochlorite (Na Hypo), 2) 12 mg·L-1 sodium hypochlorite and 9 mg·L-1 gibberellic acid (Na Hypo+GA), 3) 12 mg·L-1 sodium hypochlorite and 20 g·L-1 sucrose (Na Hypo+SCR) and 4) 12 mg·L-1 sodium hypochlorite, 9 mg·L-1 gibberellic acid and 20 g·L-1 sucrose (Na Hypo+GA+SCR), with 3 replicates. Flowers were held at room temperature (23°C) with 12 hours of light per day to determine maximum vase life for each cultivar. Each flower bud was tagged with opening date, bud number, treatment, and ending date on it (Figure 1). Ending date was determined when flower part abscised or fading petal color. The total days between opening date and ending date was calculated as vase life. The 3-way Factorial Experiment Design was used in this experiment with the month (April to August) as the first factor, the light level (NFS, BSC and ASC) as the second factor and the solutions (4) as the third factor. To analyze the vase life a three-way ANOVA was used.

Figure 1: Hybrid lilies in solution treatments and buds tagged.

RESULTS

The data from the vase life study resulted in general trends for the combinations of Asiatic and LA hybrids and also Oriental and OT hybrids. Therefore the data presented here for 'Samar' (LA) hybrid lily is representative of the Asiatic and LA hybrids and 'Gluhwein' (OT) hybrid lily is representative of the Oriental and OT hybrids. Month of planting indicated a trend of reduced vase life especially in July for all hybrid lilies, but was not always significantly different as shown for 'Samar' and 'Gluhwein' (Figures 2 & 3). This may have been attributed more to the temperatures at the time of harvest than the actual planting date. The shade treatments of ASC and BSC tended to enhance vase life, but were not always significant for all cultivars (Figures 4 & 5). Only the Oriental hybrid lilies resulted in a significant reduction in vase life under NFS. The only consistent result was related to solutions (preservatives). The Asiatic and LA hybrid lily cultivars had a significant increase in vase life for the Na Hypo+GA+SCR solution as represented by 'Samar' (Figure 6). Conversely, the Oriental and OT hybrid lily cultivars resulted in increased vase life for the Na Hypo+ GA solution as shown by 'Gluhwein' (Figure 7).

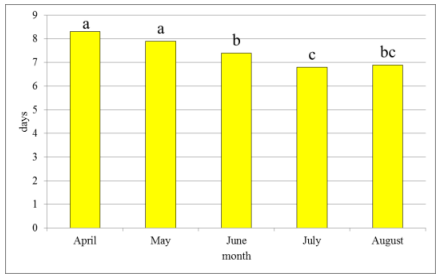

Figure 2: Vase life of 'Samar' (LA) hybrid lilies related to month of planting.

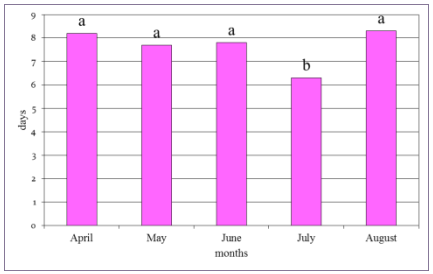

Figure 3. Vase life of 'Gluhwein' (OT) hybrid lilies related to month of planting.

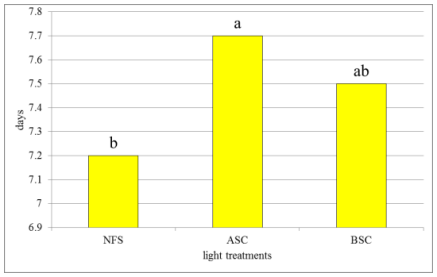

Figure 4. Vase life of 'Samar' (LA) hybrid lilies relation to light treatment.

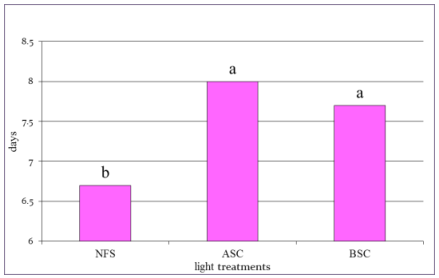

Figure 5. Vase life of 'Gluhwein' (OT) hybrid lilies related to light treatment.

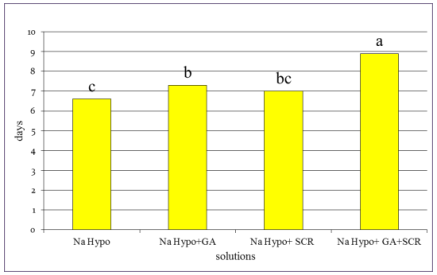

Figure 6. Vase life of 'Samar' (LA) hybrid lilies in relation to preservative solution.

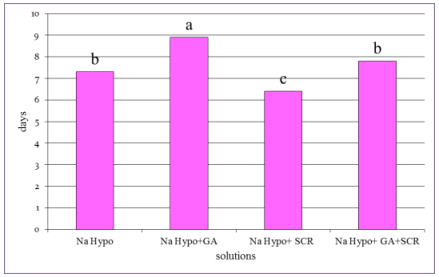

Figure 7. Vase life of 'Gluhwein' (OT) hybrid lilies related to preservative solution.

CONCLUSIONS

For Asiatic and LA hybrid lilies the Na Hypo+GA+SCR significantly increased vase life. However, for the Oriental and OT hybrid lilies the Na Hypo+GA solution significantly increased vase life. Only the Oriental hybrid lilies grown under NFS had a significant reduction in vase life. There was no consistent vase life trends related to planting month.

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