Effects of Depulping, Stratification, and Growth Regulators on Seed Germination of Liriope muscari

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Abstract. Depulped seeds of Liriope muscari (Decne.) L. H. Bailey pretreated with GA3 and/or kinetin and placed at 21°C for warm stratification, showed increased germination over un pulped seeds. Germination rates ranged from 87 to 100%. Identical growth regulator treatments resulted in no germination when the depulped seeds were cold stratified (5°C). Unpulped seed, pre-soaked in water for 24 hours or not soaked and given warm stratification germinated 38 and 25%, respectively. This suggested that the inhibition in unpulped seed is influenced by a water soluble inhibitor in the fruit wall.

Liriope muscari, big blue liriope, is one of the most commercially important ground covers in the southern landscape, and is widely used in the Southwest and California. Grass-like, evergreen foliage, lilac-purple flowers, sun and shade tolerance, insect and disease resistance, and adaptability to a wide range of soil types are attributes contributing to its popularity. Liriope displays a high degree of salt tolerance which makes it particularly useful in coastal landscapes. It produces abundant blue-black berries on upright spikes in fall. Seed would appear to be the logical method of propagation although division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive though division, which is more expensive

Depulped seeds were either soaked for 24 hr in water (control) or the following growth regulators: gibberellic acid (GA3), 30, 60, 90 ppm; kinetin, 30, 60, 90 ppm; and GA3 + kinetin, 30:60, 45:45, 60:30 ppm. The seeds were then rinsed, treated with sodium hypochlorite, rinsed with distilled-deionized H2O and placed in polyethylene bags with moist sphagnum peat and placed at 21°C in a Precision Scientific incubator. One hundred and 50 seeds were used for each treatment.

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Germination requirements of Liriope seed are not available from the literature. Dormancy mechanisms in other members of the Liliaceae, specifically Trillium grandiflorum (Michx.) Salisb. (2, 3, 4, 7), Polygonatum biflorum (Walt.) Ell., and Lilium species (2, 3) posed questions as to the germination requirements of Liriope. This study examined the effects of unpulped compared to depulped fruits, warm compared to cold stratification, and exogenously applied growth regulator treatments on the germination of Liriope muscari. Fruit of Liriope muscari was collected on November 3, 1979 at the University of Georgia Botanical Garden, Athens, and stored dry for 120 days at 5°C. Unpulped fruits were: a) soaked for 24 hr in distilled water, placed in a 0.525% sodium hypochlorite solution for 15 min, rinsed in distilled-deionized water, or b) given only the 0.525% sodium hypochlorite sterilization treatment. Both groups were then placed in polyethylene bags with moist sphagnum peat and held at 21°C in a Precision Scientific incubator. One hundred and 50 seeds were used for each treatment.

Radicle emergence from depulped seeds was evident after 3 weeks. At the end of the 6th week in warm stratification, radicle emergence of 98% was observed in the depulped treatments (Table 1). Germination percentages for both radicle and shoot emergence among all depulped treatments were not significantly different. However, seeds soaked in water had shorter radicles and fewer shoots developed compared to those receiving growth regulator treatments. Among the various growth regulator treatments, GA3 at the various concentrations produced longer roots with secondary branching and shoots in excess of 40 mm. GA3 + kinetin treatments produced roots of similar size to GA3 alone but shoot development was noticeably less. Kinetin produced shoots and radicles intermediate between GA3 and GA3 + kinetin.

In contrast, unpulped seeds showed limited germination and, after 6 weeks, soaked and non-soaked seeds germinated (radicle emergence) 38 and 25%, respectively. Shoot emergence was also reduced, being 23 and 7% for soaked and non-soaked, respectively.

Germination treatment. Both groups were then

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<th>Treatment</th>
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<td>Cold stratification</td>
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<tr>
<td>Warm stratification</td>
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<td>Kinetin</td>
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<td>90 93b 77b</td>
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<td>GA3 + kinetin</td>
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<td>30 + 60 98b 87b</td>
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Table 1. Effect of stratification, depulping and growth regulator pretreatments on the germination of Liriope muscari.

5Mean separation within columns by x2 test, 5% level.

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208

An Analysis of Gladiolus Merchandising

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Additional index words, gladiolus, flower marketing, conjoint analysis

Abstract. Gladioli were merchandised in various ways to measure the market acceptance of the gladiolus as a non-funeral flower. The gladiolus was found to have strong consumer acceptance in both arrangements and loose bunches. Consumer segments especially receptive to the gladiolus were males and persons less than 35 years old.

Gladiolus sales have continually diminished throughout the last decade (1). Traditionally the use of gladioli has been almost exclusively for funeral sales. As smaller arrangements and flowering plants have begun to replace larger funeral sprays, sales of gladioli have accounted for a smaller percentage of total florist sales (6). This serious decline in product sales has been hastened because no new product uses have been developed. Decreased consumer demand is reflected by an 83% reduction in the number of gladiolus producers and a decrease in production area exceeding 50% during the last 10 years (1).

Objectives of this research were to evaluate consumer acceptance of gladiolus relative to the snapdragon and hybrid tea rose and to determine if gladiolus merchandising can be altered to modify its traditional perceived flower image to a more contemporary, casual-use flower with less of a traditional, funeral image.

A stratified sampling of 99 Columbus, Ohio residents was selected by a Columbus-based marketing research firm. Consumers participated in 2 gladiolus merchandising experiments which were designed using conjoint analysis (2, 3, 4, 5, 7). According to conjoint methodology, product characteristics were varied systematically using an orthogonal array whereby the independent contributions of factors studied were balanced. Arrangements were systematically prepared on the basis of 3 levels for 3 factors, resulting in a 3-way design of 27 product combinations. A fractional factorial design was used so that participants viewed and ranked only 9 of the 27 product alternatives. A multiple regression program was used to compute utility scores for each factor attribute, which in turn determined the amount of influence each factor had in the consumer’s evaluations. The utility values were relative to the products or merchandising in each experiment and the lowest value for each factor was adjusted to a zero base. Although the consumer panel only viewed 9 of the possible 27 factor combinations (3 x 3 x 3), the methodology generated utility values for each level of each factor (Fig. 1, 2).

Fig. 1. Relative utility scores for gladioli compositions at three different price levels of loose bunch merchandising, experiment 1.1

1Utility index represents a relative utility score for purchasing components where the lowest component value was set at a base value of 0.
2Factor 1: A = yellow decorative pompon and white daisy pompon chrysanthemums; B = yellow decorative pompon and white daisy pompon chrysanthemums plus white carnations; C = yellow decorative pompon and white daisy pompon chrysanthemums plus white carnations, purple statice and Gypsophilia.

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