Results and Discussion

'Carpet' was the first cultivar RFS, followed in order by 'Mardi Gras', 'Blue Boy' and 'Shirt Sleeves' (Figure 1), with about a month difference between 'Carpet' and 'Shirt Sleeves' and about 2 weeks between 'Carpet' and 'Mardi Gras'. Pots with the most plugs were RFS first and pots with only one plug per 8-inch pot was RFS 2-3 weeks later.

There was little difference in height of plants when RFS (Figure 2) due to planting density, but 3 plugs/8-inch pot produced slightly taller plants. There was apparently difference in height due to cultivars with 'Carpet' the shortest and 'Blue Boy' the tallest.

Width was slightly affected by planting density (Figure 3) with 'Carpet' being one of the widest. 'Blue Boy' was also wide, making it the largest of the cultivars tested. Differences in symmetry [(minimum width/maximum width)100] might be expected when comparing 2 plugs per pot to 1 or 3 plugs per pot, but all combinations were near 80, and in some cases 2 plugs per pot produced more symmetrical plant combinations than 1 plug per pot (Figure 4).

Profit was estimated to be highest for 'Carpet', followed by 'Mardi Gras', 'Blue Boy' and 'Shirt Sleeves'. Three plugs/8-inch pot would be the most profitable planting density, and 2 plugs/6-inch pot more profitable than one plug/6-inch pot (Table 1).

Proc. Fla. State Hort. Soc. 102:282-283. 1989.

EVALUATION OF *MAGNOLIA GRANDIFLORA* 'GLEN ST. MARY' FOR USE IN INTERIOR ENVIRONMENTS

CHRIS A. MARTIN AND DEWAYNE L. INGRAM
University of Florida, IFAS
Ornamental Horticulture Department
Gainesville, FL 32611

Additional index words. interiorscaping, nursery production, southern magnolia.

Abstract. ***Magnolia grandiflora* 'Glen St. Mary' was grown for 12 months in a simulated interior environment after a 6 month exposure to treatment consisting of 2 irradiance levels (full sun and 80 percent shade) and 5 concentrations of soil-applied paclobutrazol (0, 6, 12, 25, and 50 mg/pot). The interior lighting was provided by 60 watt cool-white fluorescent lamps and maintained for 16 hours daily (30 μmol m^{-2} s^{-1} at canopy height). Temperature was maintained at 25°C. Trees produced under full-sun survived longer in the interior environment compared to shade-grown trees which began to decline after 6 months. Increased paclobutrazol application rate reduced the length of tree survival.**

The continuing popularity of interiorscaping necessitates research directed towards cultural practices which extend the useful life of plants, expecially in low light environments. Plants growing in low light frequently exhibit symptoms such as etiolation, necrosis, chlorosis, and leaf drop (1). The useful life of plants has been shown to be affected by production light levels (7). Previous research suggested that the interior performance of *Ficus benjamina* was enhanced by growing plants under reduced production light levels (2, 3). However, Nell and Barrett (5) found that interior performace of poinsettia was enhanced by high production light levels even though poinsettias grown at low production light levels had lower light compensation points. Use of growth regulators during the production period may increase tree longevity by affecting carbohydrate storage.

Magnolia grandiflora 'Glen St. Mary' possesses a structure and form suitable for use in interior environments as a substitute for the more common tropical tree species. The objective of this study was to evaluate the interior performance of *Magnolia grandiflora* 'Glen St. Mary' as a function of production irradiance level and paclobutrazol rate.

Materials and Methods

A previous experiment was conducted to assess the growth response of 'Glen St. Mary' magnolia to 2 production irradiance levels of full sun and 80% shade and 5 concentrations of soil-applied paclobutrazol of 0, 6, 12, 25, and 50 mg/pot (4). Upon termination of the previous experiment, 40 trees grown in one-gallon polyethylene containers using Metro-Mix 500 growth medium (W. G. Grace and Co., USA) were moved into a simulated low light interior environment for a period of 12 months. The interior lighting was provided by 60 watt cool-white fluorescent lamps [30 μmol m^{-2} sec^{-1} PPF measured at canopy height by a LI-COR quantum radiometer (LI-COR Inc., Lincoln, Neb.)] and maintained for 16 hours daily. Temperature was maintained at 24°C. Tree were watered to container capacity once per week or as needed and no additional fertilizer was applied.

A tree viability count and a visual rating of viable trees were conducted monthly. The visual rating scale was based upon leaf size and color, foliage density, and overall plant size. Trees were rated from 1 (poorest) to 5 (excellent).

The experimental design was a 2 by 5 factorial arrangement in a completely randomized block with 4 single tree replicates. The data were analyzed using analysis of variance and regression. Regressionn coefficients were tested for homogeneity of fit using the F test.

Results and Discussion

The survivability of 'Glen St. Mary' magnolia in a simulated interior environment was affected by previous production treatments (4). Survival was longest for trees initially grown under full sun compared to trees grown in the shade (Figure 1). The mean length of survival increased quadratically with decreasing paclobutrazol rate applied during the production period (Figure 2). There was no

Florida Agricultural Experiment Station Journal Series No. N-00180.

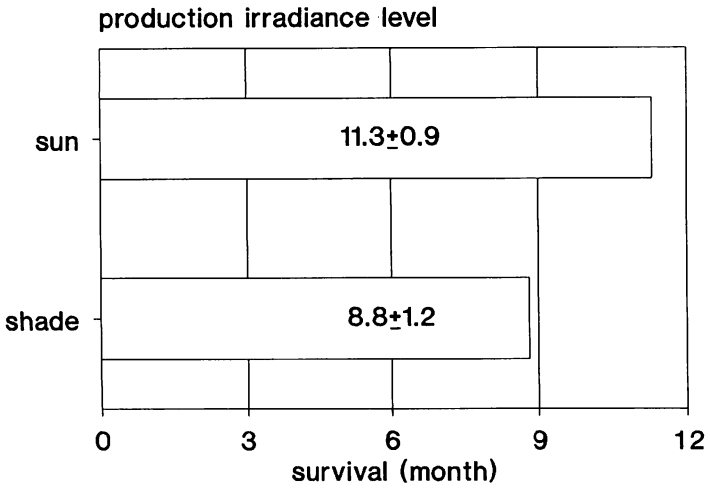

Fig. 1. Effect of production irradiance level on length of survival of *Magnolia grandiflora* 'Glen St. Mary' in a simulated interior environment, PR>F = .0001, r^2 = 0.789.

interaction effect of production irradiance level and paclobutrazol rate on the length of tree survival in the interior environment. The quality of all trees remained unchanged prior to death (data not shown). Trees that failed to survive exhibited a rapid decrease in overall quality beginning approximately 2 weeks prior to death, thus quality ratings did not indicate treatments with high mortality percentages.

Trees did not grow in the interior environment. All trees survived the interior environment for 6 months; however, after 10 months 37.5% of all trees had died. The average survival time for sun-grown trees was 2.5 months longer than shade-grown trees (Figure 1). At the end of one year in the interior environment, all sun-grown trees with no paclobutrazol applied during the production period were alive. Under these conditions, mortality within 12 months would appear most likely to occur to trees produced in shade and soil-drenched with paclobutrzol. Our results agree with the findings of Nell et al. (6) who suggested that the interior longevity of chrysanthemum may be correlated with stored carbohydrate reserves. Trees produced under shade and drenched with paclobutrazol were smaller compared to trees produced under sun with no paclobutrazol applied (4). These data support the

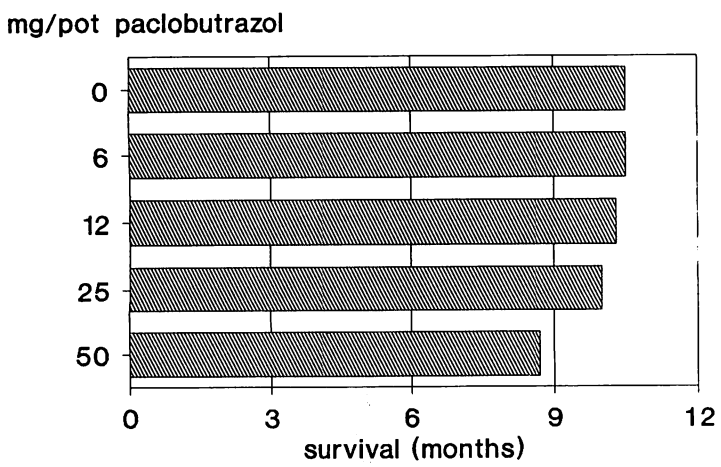

Fig. 2. Effect of paclobutrazol application rate during production on length of survival of *Magnolia grandiflora* 'Glen St. Mary' in a simulated interior environment, PR>F = .0014Q, r^2 = 0.78.

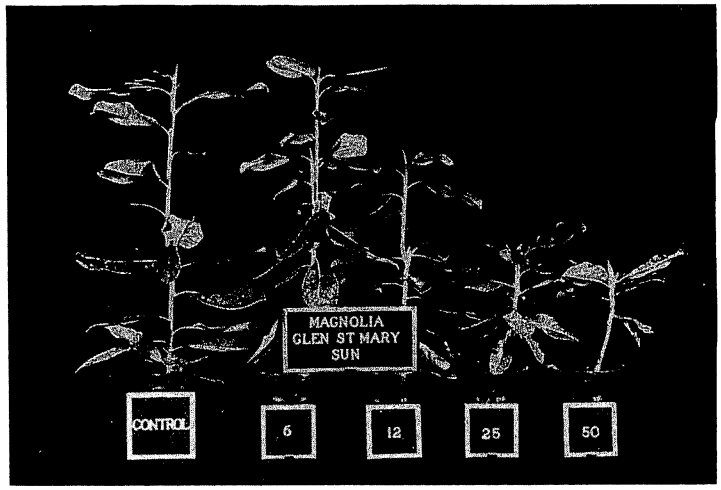

Fig. 3. Sun-grown *Magnolia grandiflora* 'Glen St. Mary' after 9 months of exposure to a simulated interior environment. The interior lighting was provided by 60 watt cool-white fluorescent lamps. Light intensity was measured at 30 μmol m^{-2} sec^{-1} PPF at tree canopy height.

hypothesis that smaller trees have fewer carbohydrate reserves available for use while being maintained in a low light environment.

The low light environment affected tree morphology. After 2 weeks in the interior environment, leaf apices of sun-grown plants were increased as the leaves tended to orient perpendicular to the stem with the adaxial leaf surface parallel to the overhead light source (Figure 3). Leaves also became polished and glabrous in appearance.

Plants grown in interior environments can provide suitable habitats for incubation of insect and pathogen populations. At month 3, all trees were treated for red spider mites and at month 6, trees were treated for magnolia leaf scale.

In summary, this study has demonstrated that *Magnolia grandiflora* 'Glen St. Mary' can be maintained in a low light interior environment without a reduction in tree quality for at least 12 months if trees were previously grown under full sun. The use of a paclobutrazol drench decreased the length of tree survival and suggest that magnolia survivability is best lengthened by production practices that maximize tree size.

Literature Cited

1. Braswell, J. H., T. M. Blessington, and J. A. Price. 1982. Influence of production and postharvest light levels on the interior performannce of two species of scheffleras. HortScience 17:48-50.
2. Collard, R. M., J. M. Joiner, C. A. Conover, and D. B. McConnell. 1977. Influences of shade and fertilizer on light compensation point of *Ficus benjamina*. J. Amer. Soc. Hort. Sci. 102:447-449.
3. Conover, C. A. and R. T. Poole. 1977. Effects of cultural practices on acclimatization of *Ficus benjamina*. J. Amer. Soc. Hort. Sci. 102:529-531.
4. Martin, C. A. and D. L. Ingram. 1988. Paclobutrazol and irradiance level affect growth of *Magnolia grandiflora* 'Glen St. Mary'. Proc. Fla. State Hort. Soc. 101:316-318.
5. Nell, T. A. and J. E. Barrett. 1986. Production light level effects on light compensation point, carbon exchange rate and post production longevity of poinsettias. Acta Horticulturae 181:252-262.
6. Nell, T. A., J. E. Barrett, and M. T. Leanard., 1989. Effect of fertilizer termination and production irradiance level on growth, simulated shipping, and interior longevity of chrysanthemum. HortScience (accepted for publication).
7. Poole, R. T. and C. A. Conover. 1980. Influence of light and fertilizer levels on production and acclimatization of *Pittosporum* spp. HortScience 15:201-203.