



Propagation Protocols for Yellow-flowered Cultivars of Magnolia

Gary W. Knox and Jyotsna Sharma
Department of Environmental Horticulture - Quincy
University of Florida

Nature of Work: Demand for yellow-flowered cultivars of *Magnolia* is high but clonal propagation remains difficult. Stem cuttings of noteworthy cultivars, e.g., 'Butterflies', have proven difficult and do not produce roots when traditional methods are used. Other cultivars ('Maxine Merrill', 'Golden Sun', 'Hot Flash' and 'Gold Cup') show promise and merit further study. Cuttings collected from plant parts displaying juvenile characteristics often are easier to root. Rooting also can be improved by taking cuttings from young seedling or clonal plants. To our knowledge, cultivars of yellow-flowered magnolias have not been tested for either of these characteristics. Our objectives were to: 1) evaluate the effect of cutting source (location on tree), rooting hormones and date after budbreak on rooting cuttings of 'Ivory Chalice'; 2) compare rooting of cuttings collected 5-6 and 7-8 weeks after budbreak from a mature tree of 'Hot Flash' and its' recently propagated clones; and 3) continue studies with cuttings of 'Butterflies' to determine the effect of collection date and mixtures of IBA and NAA on rooting.

Evaluations of cutting source (location on tree), rooting hormones and date after budbreak on rooting cuttings of 'Ivory Chalice'. To study the effect of cutting location on the tree, cuttings were taken from the upper and lower canopy of a mature, field-grown tree in Quincy, Florida. The upper and lower canopy corresponded to branches originating above or below a height of 5 feet on the trunk. Terminal cuttings with 2 to 4 nodes were collected at 7 and 9 weeks after vegetative budbreak, corresponding to softwood and semi-hardwood stages of growth (Table 1). Twelve cuttings of each treatment were assigned randomly to three water-based treatments: 1) 0 ppm; 2) 10,000 ppm K-IBA and 2,500 ppm K-NAA (4:1, K-IBA:K-NAA); 3) 20,000 ppm K-IBA and 2,500 ppm K-NAA (8:1, K-IBA:K-NAA).

Rooting comparisons of cuttings collected 5-6 and 7-8 weeks after budbreak from a mature tree of 'Hot Flash' and its' recently propagated clones. Cuttings of 'Hot Flash' were collected from a mature, field-grown tree in Quincy, Florida, and from plants in #5 containers grown from cuttings taken from the parent plant in 2001. Terminal cuttings with 2 to 4 nodes were collected at 5-6 and 7-8 weeks after vegetative budbreak, corresponding to softwood and semi-hardwood stages of growth (Table 1). Twelve cuttings of each treatment were assigned randomly to four water-based treatments: 1) 0 ppm; 2) 5,000 ppm K-IBA and 2,500 ppm K-NAA (2:1, K-IBA:K-NAA); 3) 10,000 ppm K-IBA and 2,500 ppm K-NAA (4:1, K-IBA:K-NAA); and 4) 20,000 ppm K-IBA and 2,500 ppm K-NAA (8:1, K-IBA:K-NAA).

Evaluations of collection date and mixtures of IBA and NAA on rooting cuttings of 'Butterflies'. Cuttings of 'Butterflies' were taken from a mature, field-grown tree in Quitman, Georgia. Terminal cuttings with 2 to 4 nodes were collected at 6 and 8 weeks after vegetative budbreak, corresponding to softwood and semi-hardwood stages of growth (Table 1). Twelve cuttings of each treatment were assigned randomly to four water-based treatments: 1) 0 ppm; 2) 5,000 ppm

K-IBA and 2,500 ppm K-NAA (2:1, K-IBA:K-NAA); 3) 10,000 ppm K-IBA and 2,500 ppm K-NAA (4:1, K-IBA:K-NAA); and 4) 20,000 ppm K-IBA and 2,500 ppm K-NAA (8:1, K-IBA:K-NAA).

For each study, cuttings were inserted into containers (2 ¼ in. by 2 ¼ in. at the top and 3 in. deep) holding a 1:1 mixture (by volume) of sphagnum peat and coarse perlite. Treated cuttings were placed under an intermittent mist system applying 6 s of mist every 6 min during daylight hours. Mist was emitted at 35 to 45 psi via brass deflector-type nozzles with 1 mm orifice.

Rooting was recorded 12 weeks after each group of ‘Ivory Chalice’ and ‘Hot Flash’ cuttings was collected and at 12, 16 and 20 weeks after each group of ‘Butterflies’ cuttings was collected.

Results and Discussion: Results from the current studies are not yet complete. Rooting of cuttings taken on or before May 13 may have been reduced due to failure of the mist system during a water outage. Previous experimental results showed rooting of ‘Ivory Chalice’ and ‘Yellow Lantern’ cuttings is maximized by collecting terminal cuttings within 5 to 11 weeks after budbreak. Application of 16,000 or 30,000 ppm IBA in talc improved visual rating among cuttings of ‘Ivory Chalice’ and ‘Yellow Lantern’. Although callus was observed, rooting of ‘Butterflies’, ‘Golden Sun’, ‘Hot Flash’ and ‘Maxine Merrill’ cuttings were not influenced by IBA or collection date.

Significance to Industry: Few cultivars of yellow-flowered *Magnolia* are widely available due to their novelty and difficulty in propagation. Advances in propagation can increase the production of high-value, high-demand crops such as yellow-flowered cultivars of *Magnolia*.

Table 1. Rooting studies, selections used of yellow-flowered *Magnolia* and corresponding dates of budbreak and cutting collection.

Rooting Studies	Selection	2005 Date of Budbreak	Date for Cutting Collection and Treatment
Evaluations of cutting source (location on tree), rooting hormones and date after budbreak	‘Ivory Chalice’	Feb. 28	Apr. 18 (7 weeks after budbreak) May 3 (9 weeks after budbreak)
Comparisons of cuttings collected from a mature tree and its’ recently propagated clones at two times after budbreak	‘Hot Flash’ (field-planted, mature parent plant)	Mar. 28	May 3 (5 weeks after budbreak) May 17 (7 weeks after budbreak)
	‘Hot Flash’ (four plants in #5 containers grown from cuttings taken from the parent plant in 2001)	Apr. 4 ^z	May 17 (6 weeks after budbreak) ^y May 31 (8 weeks after budbreak)
Evaluations of collection date and mixtures of IBA and NAA	‘Butterflies’ (U.S. Plant Patent #7456)	Mar. 28	May 11 (6 weeks after budbreak) May 25 (8 weeks after budbreak)

^z Budbreak was delayed 1 week for plants growing in containers under 30% shadecloth.

^y Plants growing in containers required 6 weeks (one week more than the field-grown parent) to produce shoots of a sufficient length for harvesting cuttings.