Developments in Magnolia Propagation

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At Prenor Nurseries we were not obtaining a satisfactory yield of magnolias propagated by softwood cuttings (e.g., *Magnolia* x*soulangiana* 'Alexandrina', *M. liliiflora* 'Nigra'). A number of different treatments were tried on both the mother plants and the cuttings. The first trial involved girdling the mother plants with plastic bands or metal wires but this did not result in yield improvements. The second trial compared different concentrations of rooting hormone treatments and different sticking times. This showed that yields were improved when cuttings were taken as early as possible, then left in the plugs after rooting and not potted until the next spring. The plants are overwintered in greenhouses, and new shoots are used as cuttings, since most of them have to be removed at this time anyway. The rooting percentage of cuttings treated in this way was 95%.

INTRODUCTION

Magnolia hybrids and cultivars are propagated vegetatively. Methods such as grafting and layering are still in use, but most nurseries now propagate them by cuttings (Tomayer, 1992). But with such difficult-to-root plants the results are not always satisfactory and many plant propagators have undertaken trials on various pretreatments of the mother plants (Maynard and Bassuk, 1988; Schmidt, 1982). Magnolias do not transplant well (Callaway, 1995), and are difficult to overwinter, so the potting time of the rooted material is also a key issue.

The aim of the trials described in this paper was to find a method involving either mother plant pretreatment or timing of cuttings, which Prenor Nurseries could use to improve the yield of its magnolia propagation.

MATERIALS AND METHODS

In 1995 and 1996 the trials were carried out at Prenor Nurseries in Szombathely, Hungary, on two taxa: *Magnolia* ×*soulangiana* 'Alexandrina' and *M. liliiflora* 'Nigra'.

Two trials were based on the following treatments:

Girdling of the Mother Plants as a Pretreatment. In the first year plastic bands were used to girdle the plants; metal wires were used in the second year. Four girdling times were compared and the cuttings were taken at either 3 or 5 weeks after the treatments.

Comparison of IBA Concentrations. Concentrations compared were 0.6%, 0.8%, 1.0%, and 1.2% in the first year, and 0.6%, 1.0%, 1.4 % in the second. The concentrations in the second year were chosen because it was felt they would be likely to show more clearly the differences between high and low doses.

Comparison of Sticking Times. Cuttings were stuck at 14-day intervals from 20 June until 9 Aug.

In 1997 the trials were undertaken at the Humboldt University, Berlin, Germany, on two different taxa: *M.*'Susan' (*M. stellata* 'Rosea' × *M. liliiflora* 'Nigra'); and *M. ×loebneri* 'Merrill'

The aim of this part of the research was to use microscopy to make anatomical observations on the process of rooting in the cuttings. In addition a practical trial was also undertaken, comparing the effect of two different solvents (ethanol and acetone) for the IBA on rooting yield. The IBA concentration was 1.0% in both solvents, and results were compared with a control batch of cuttings which were not treated with rooting hormone. Cuttings were all stuck on 12 July.

In all trials the cuttings were stuck in plug trays, and rooted under mist irrigation, then overwintered in greenhouses and potted on after 15 May the following year. Before potting the plants were pruned back, and the cuttings used for further propagation. All trials were evaluated after overwintering because this is such a crucial stage in the propagation of these plants.

RESULTS

Table 1. Effect of girdling, IBA concentration, and sticking date on yield (measured as percentage of cuttings rooted and surviving over winter) of *Magnolia ×soulangiana* 'Alexandrina' and *M. liliiflora* 'Nigra', propagated from cuttings in Summer 1995.

		IBA concentration				
		0.6	0.8	1.0	1.2	Control (0.8)
		Yield Rooted				
Date girdled (weeks before sticking)	Date stuck	(%)	(%)	(%)	(%)	(%)
M. ×soulangiana						
3	20 Jun	34	44	49	35	57
5	5 Jul	12	17	28	20	-
3	6 Jul	20	32	21	38	33
5	18 Jul	28	33	52	47	27
3	19 Jul	65	40	64	61	-
5	1 Aug	27	15	25	30	9
3	2 Aug	23	42	30	47	-
5	9 Aug12	9	22	21	6	
M. liliiflora						
3	21 Jun	67	81	74	73	
5	5 Jul	20	26	8	20	
3	6 Jul	34	62	54	55	
5	18 Jul	42	43	44	45	
3	19 Jul	48	42	53	48	
5	1 Aug	37	18	25	20	
3	2 Aug	17	20	19	23	
4	9 Aug	4	15	6	2	

Table 2. Effect of IBA concentration on rooting percentage and average number of roots per cutting, after survival over winter, of *Magnolia* ×*soulangiana* 'Alexandrina' cuttings at different sticking times in 1996.

	IBA concentration					
	0.6		1.0		1.4	
Date Stuck	Root (%)	No. roots	Root (%)	No. roots	Root (%)	No.roots
5 June	34	6	56	6	54	6
20 June	53	9	40	9	61	8
4 July	21	5	18	6	18	6
23 July	38	4	21	6	33	6

Effect of Rooting Hormone Solvent. The highest rooting percentage was achieved with ethanol solution (with which the rooting percentage was 58.8%), and the lowest was with the acetone solution (0% rooting for *M.* ×*loebneri* 'Merrill', and 12.5% with *M.* 'Susan'). Cuttings not treated with rooting hormone gave surprisingly high yields in this trial (e.g., 51% rooting of *M.* 'Susan').

DISCUSSION

Girdling had no beneficial influence on the rooting percentage of the cuttings. Sticking time proved to be the most important tool for the nursery, with the best results coming from cuttings taken as early in the season as possible. Early sticking means the plants have a longer period of growth and establishment which leads to better survival over winter. The rooting percentage before overwintering is always around 95%.

A rooting hormone concentration above 0.8 % in ethanol gave the best results.

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