

MIST PROPAGATION OF SUGAR MAPLE

(*Acer saccharum* Marsh.)

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Trials on mist propagation of sugar maple have been in progress since 1968 in Toronto, Ontario, as part of the "Superior Shade Tree Programme for Ontario" (6). Procedures on vegetative propagation have recently been reviewed (1). Softwood cuttings (15 cm) of sugar maple collected in June have been rooted with varying success, using IBA and mist (2, 3, 4, 5, 8). Little information was available on the precise effect of auxins, length of cuttings, base diameter and a number of other questions. A number of small exploratory tests were carried out over the last 4 years to gain information on mist propagation of this species.

The rooting medium was a 2:1:1 (v / v / v) mixture of sandy loam top soil, vermiculite, and peatmoss, sterilized at 82° C.

Collection of cuttings. Juvenile softwood cuttings taken in the middle of June in Dorset, Ontario, rooted between 65 % and 89 %. At this time cuttings had fully elongated bottom leaves while the apical meristem was in full growth. Cuttings taken in the middle of May decayed under the mist.

Cuttings were severed with clippers or the cuttings were broken at the base of softwood growth. The effect of dividing one shoot into two cuttings is shown in Table 1; the thicker cuttings rooted better, and there was a slight improvement in rooting of the top parts as compared to bottoms.

Table 1. Effect of base diameter on rooting of sugar maple softwood cuttings (30 cm).

Ave. Base Dia. (mm)	Number of Cuttings	Percent Rooted	
		Bottoms	Tops
3.5	300	36	39
4.5	200	45	66
5.5	100	73	75

Cuttings were collected from stump sprouts which varied in length from 10 to 90 cm. These shoots were very vigorous and rooted without application of auxins, and were classed as juvenile (7). Cuttings also rooted from the lower crown part of selected sugar maples without the use of auxins, but the percentage of rooting varied from tree to tree.

Auxins. Softwood cuttings (15 cm) containing terminal buds were basal-dipped with 0.1, 0.4 and 0.8% of IBA in talc and 25, 50 and 100 mg / l of IBA in distilled water for 1 minute, each group containing 50 cuttings. Rooting did not improve with any of the treatments as compared to the controls with 60 to 80% rooting. When concentrations of IBA in distilled water were increased to 1000, 5000, and 10,000 mg / l for a 10 second dip, softwood cuttings—varying in length from 15 to 55 cm—all decreased their rooting to 20% as compared to 80% for controls.

Wounding of softwood cuttings by slicing lightly on the base appeared detrimental (Table 2) to rooting, with or without the aid of auxins.

Table 2. Effect of wounding on rooting of softwood cuttings (15 cm) treated with IBA (100 cuttings per group).

Treatment	Percent Rooted	
	Unwounded	Wounded
Control	64	55
0.1% IBA *	64	48
0.4% IBA	53	33
0.8% IBA	33	40

* Commercial preparation in talc powder.

Effect of base diameter and terminal buds. Softwood cuttings (35 cm) were graded into 3 base-diameter classes, each containing 200 cuttings. Terminal buds were removed on half the cuttings in each group. The effect of terminal buds in controlling auxins appears non-existent (Table 3). The effect of base diameter (Table 3) on rooting is slight.

Combination softwood-hardwood cuttings. The purpose was to root long shoots. A series of juvenile cuttings collected in June, ranging from 15 to 120 cm was divided into control and treatment lots. All groups, except for softwood controls (15 cm), contained a combination of softwood on wood—from one or more previous years. All

cuttings remained green under mist for about 4 weeks, after which the longest, followed by the shorter lengths, died successively without rooting. The control (15 cm) and 35 cm combination cuttings rooted (Table 4). IBA treatments had no effect. Bottoms of the large cuttings became infected.

Table 3. Effect of wounding on rooting of softwood cuttings (15 cm) treated with IBA (100 cuttings per group).

Average Base Dia. (mm)	Percent Rooted, with Terminal Bud	
	—Intact	—Removed
3.0	86	86
4.0	88	89
5.5	91	90

Table 4. Effect of cutting length on rooting of softwood-hardwood combination cuttings (100 cuttings per group).

Type	Size (cm)	Percent Rooted	
		Control	Treated *
Softwood	15	65	62
Soft-hard	35	23	14
Soft-hard	55	0	1
Soft-hard	90	0	0
Soft-hard	120	0	0

* 1 minute dip in 25 mg / l of IBA in distilled water.

Finally, juvenile softwood cuttings 15, 35, 55, 65 and 75 cm long were sorted into thick and thin cuttings. Cuttings 35 and 55 cm long rooted between 75 and 89 % ; cuttings longer or shorter rooted less. With 15 to 55 cm lengths, thick cuttings rooted better than thin cuttings.

LITERATURE CITED

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MODERATOR PINNEY: Mr. Morsink tells me he will be with us tonight for the Question Box and so I will allow only one question at this time.

VOICE: What has been your experience in over-wintering these rooted cuttings?

BILL MORSINK: We have been trying many different treatments, with and without heating cables, and to date the best treatment has been without heating cables but with a heavy mulch of oak leaves. This has given us about 75% survival.

MODERATOR PINNEY: Thank you very much, Bill.

The next gentleman on our program is no stranger to any of us; he is Dick Bosley and he is going to talk to us concerning rhododendron mythology. This ought to be an interesting subject so I will turn the program over to Richard.