

need a contractor for application as with methyl bromide. Blazamid, however, does not provide the same degree of disease control and turn around time is 3 to 4 weeks.

PETER VERMEULEN: Would you comment on the use of encapsulated fertilizers in combination with capillary watering?

BRUCE MacDONALD: There is certainly less chance of salt buildup with overhead watering than with capillary watering. Rain should help to remove excess salts if they do build up, or overhead watering can be used to remove the salts. Top dressing with fertilizer, however, is generally useless with capillary watering because the top soil layer is often dry.

HUGH STEAVENSON: What is the trend in England on the use of the polythene bag as a growing container?

BRUCE MacDONALD: The trend is back to rigid pots. Transport factors, labor and handling costs, and potting machines have influenced the trend.

JIM WELLS: Blazamid is not available in the U.S.; however, Vapam is very similar and equal to it.

JIM WELLS: Do you see any trends occurring in the size of plants being grown in containers?

BRUCE MacDONALD: We are seeing a development to larger containers for trees and large conifers. At the same time there is also a trend towards smaller containers for young plants and the mass market outlets.

PROPAGATION OF ACER CAMPESTRE, A. PLATANOIDES, A. RUBRUM, AND A. GINNALA BY CUTTINGS

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This survey-study was initiated to determine if *Acer campestre*, *A. platanoides*, *A. rubrum*, and *A. ginnala* could be propagated by cuttings and grown using accelerated growth techniques, as developed by Hanover et al (7), to produce a 3 to 4 foot plant in one season. During the past decade Davidson (3), Schwab (9), and others have noted continual graft incompatibility within the cultivars of *A. rubrum*. Presently, it hasn't been determined if this incompatibility is pathologically or physiologically induced or is due to a provenance response of the stock (personal conversation with Davidson (3)).

Softwood cuttings were used in this study so that the plants could be grown on using accelerated growth techniques after propagation (6,7,8,10). It was felt that juvenility moves ac-

ropetally in plants, and juvenile plants (seedlings) are more photoperiodic responsive than mature plants (7,10). If this hypothesis held up, one could maximize growth. Softwood cuttings of the aforementioned *Acer* species were taken at 2-week intervals to determine the optimal time to take cuttings. Brown and Dirr (1) and Burd and Dirr (2) suggested there was an optimal time for taking selected *Malus* cultivar cuttings. Further, they suggested that softwood cuttings were superior to hardwood cuttings when continued growth was desired.

METHODS AND MATERIALS

The cuttings of *A. campestre* and *A. platanoides* were taken at two-week intervals commencing on May 23, 1979. Cuttings of *A. rubrum* were taken at 2-week intervals commencing with May 30, 1979. All cuttings were approximately 8 cm long with two nodes and dipped in a 10% sodium hypochloride solution for 20 minutes to disinfect the surface of the cuttings. Subsequently, the cuttings were dipped in Hormodin #3 and placed under intermittent mist with bottom heat. The mist was set to come on for 10 seconds every 7½ minutes. The media temperature was adjusted to 24°C (75°F). The cuttings were checked every 2 weeks to determine if they were rotting, callus formation was evident, or if the plants had rooted.

RESULTS AND DISCUSSION

A. campestre proved to be a relatively easy plant to work with. Most plants callused heavily with good rooting on cuttings taken on or around June 4. These profusely rooted plants established rapidly. As the summer progressed, rooting percentages decreased significantly. When working with *A. platanoides*, although the plants started activity earlier in the season (broke dormancy), they showed a clear tendency to rot, with 12 of the 20 plants rotting and only 5 showing callus on the early cuttings. But by June 18, rot was no longer evident and profuse callusing was common, with 17 of the 20 cuttings rooted. *A. rubrum*, also, showed tendency to rot early in the season with heavy callusing after the initial terminal elongation stopped, but with good rooting of cuttings taken in mid-June. *A. ginnala* cuttings taken any time throughout the study showed little tendency to rot. As summer progressed from May 30 through June 26, callusing and rooting percentages increased dramatically with 18 of the 21 cuttings rooting as late as June 26. Additional study is needed to correlate high rooting with some morphological characteristics. In reference to *A. campestre*, *A. platanoides*, and *A. rubrum*, there is little question that cuttings taken very early in the season usually show tendencies toward rotting while cuttings taken in mid-June rooted

in commercially accepted percentages. In contrast, *A. ginnala*, continued to show increased rooting and may, in fact, allow taking cuttings over longer periods of time, therefore, more efficiently utilizing propagating facilities. The rooted cuttings grown under accelerated growth techniques, showed a positive response but additional study is needed. Some of the plants doubled in size every 2 weeks but cultural practices, such as fertilizer, water, and storage must still be worked out.

Table 1. Propagation response of cuttings of *Acer campestre*, *A. platanoides*, *A. rubrum*, and *A. ginnala*. 1979.

Species and dates stuck	Number of Cuttings			
	Stuck	Rotted	Callused	Rooted
<i>A. campestre</i>				
May 23	20	7	12	8
June 4	20	—	19	15
June 18	20	—	15	1
July 2	21	—	16	5
<i>A. platanoides</i>				
May 23	20	12	5	0
June 4	25	5	10	1
June 18	20	—	19	17
July 2	20	—	17	5
<i>A. rubrum</i>				
May 30	20	13	6	4
June 16	20	—	20	18
June 26	20	2	18	12
<i>A. ginnala</i>				
May 30	20	2	10	7
June 16	20	—	16	9
June 26	21	—	20	18

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RAY MALEIKE: How old were the trees that the cuttings came from?

DOUGLAS CHAPMAN: They were mature and cuttings were taken throughout the plant.

RALPH SHUGERT: Would you comment on your accelerated growth technique and the use of supplementary light?

DOUGLAS CHAPMAN: Harold Davidson and I believe that the production techniques could be significantly different. There is no reason why we could not root the cuttings, develop a good root system, put them in cold storage, and bring them back into a greenhouse in March. By doing this you would be back into an acceptable daylength and good light quality. We have looked at leaving the rooted cuttings under lights; however, we did not get any response until fertility levels were acceptable.

BILL CUNNINGHAM: You mentioned disinfecting the cuttings. What did you use for this purpose?

DOUGLAS CHAPMAN: We use 10% Clorox and it did reduce the amount of rot we encountered.

ELWIN ORTON: I would just like to comment on the study that he alluded to that I did earlier. Working with single node cuttings we obtained 96% rooting in 3 weeks with cuttings taken in July. In preliminary work with cuttings taken in August and September we got 90% rooting.

CUTTINGS FROM HERBICIDE-TREATED NURSERY STOCK — WHAT CAN WE EXPECT?

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Abstract. Fourteen herbicides were tested on cultivars of *Taxus*, *Juniperus*, *Rhododendron*, *Leucothoe* and *Pieris* from 1970 to 1979. Mature tip cuttings were harvested from 2 container and 6 field experiments following herbicide applications. None of 11 soil-applied (preemergence) herbicides and only one of the 3 postemergence herbicides caused significant reductions in rooting of cuttings. Some herbicides were applied at 2 to 4 times normal rates and reapplied 4 to 5 times in containers, or 2 to 3 times in the field before cuttings were taken. The only significant effects on rooting of cuttings from treated plants were obtained when glyphosate was sprayed over *Taxus* in