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DICK WOLFF: Just a comment on Dr. Stimart's paper. We have found that nitrogen applied late in the season is a killer with *Acer palmatum*. We store our rooted cuttings over winter at about 35°F for two winters because of some stem splitting we have encountered.

MIKE DIRR: Another comment on Dr. Stimart's paper. I have a student who is just finishing research and looking at many of the same things you are. We find that those plants that do break bud have significantly greater quantities of carbohydrate and also overwinter in greater proportion than those that do not.

DENNIS STIMART: I might also add that if you can give short days, you can override the stage 1 cold acclimation with a late season application of ammonium nitrate. How that relates to carbohydrate balance in the plant I do not know.

## PRE-SEASON PROPAGATION

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At Decker Nursery we have added a new propagation season to our schedule. This is a spring propagation of softwood or semi-softwood cuttings prior to our usual June, July, or August propagation. Our goal is to produce cuttings of high demand species, rooted directly in cell pacs, ready for container production within 4 to 8 weeks after propagation.

Our method of preseason propagation begins with the propagation medium. This mix is two parts pine bark, two parts styrofoam or its equivalent, and one part sand. Good drainage is the most important factor in this mix; however, it must also serve as a growing mix that will hold together as a root and soil plug.

The propagation containers are sheets of 72 count cell pacs held in a plastic tray. This size cell pac seems to work best for two reasons. First, the cost averages out to less than 0.5 cents

per plug. Secondly, the small soil volume is quick to fill with roots, thus producing a solid plug faster.

The hormone used is not critical as the species we have tried are easily rooted. Similar excellent results have been achieved with Hormodin #2 or Woods 1:10.

The cuttings themselves are of two different categories. The earliest cuttings we call semi-softwoods. These are cuttings of last year's growth that are just beginning to leaf out. These are produced usually in early to mid-April. The bulk of the production, however, are true softwood cuttings. These are gathered between mid-April and the end of June. Both types of cuttings are stripped of lower leaves, treated with hormone, and stuck into a cell pac.

The care of the cuttings is typical for softwoods. They are placed in a propagation bench in a greenhouse. Heat is applied on cold spring nights. Misting is done by two methods; hand misting as needed for cloudy, cold days, or timed misting for sunny days. Great care is taken to avoid over-misting, as decay can easily develop.

After the cuttings are lightly rooted, the misting is greatly reduced and they receive half-rate liquid fertilizing. This continues until the root system is extensive enough to hold the soil plug intact.

The potting of preseason plugs usually begins in late May. The plastic pots, either one or 2-gal size, are filled, positioned, and watered in advance. A pointed 5-foot wood stake of 1½ in. diameter is used to poke a hole in the medium of each pot. The plant plug is removed from the cell pac, inserted into the hole, and firmed. The pots are then watered and shaded. After 10 days the shade is removed. The plants are also fertilized with Osmocote and treated with Ronstar herbicide. The critical factor in this whole process is that the cuttings have never experienced potting shock, either as a cutting or in the container potting stage.

The development of this method began in the spring of 1984. We were already direct-sticking cuttings in cell pacs for two years during our usual summer propagation. However, due to both an increase in demand and overwintering losses during 1983 and 84, we found ourselves in need of liners for container production. We experimented with approximately 5,000 mid-May softwood cuttings of various species such as *Potentilla*, *Spiraea*, *Euonymus*, *Cotoneaster*, *Forsythia*, and *Ligustrum*. We were amazed at the growth over the summer. By fall we had sold approximately 1,000 plants, shifted 2,000 to 2-gal containers, and overwintered the rest for spring 1-gallon sales.

We expanded our experimentation in the spring of 1985 to earlier semi-softwood cuttings. We used a high peat content rooting mix but developed some stem rot problems. Overall, however, the results were favorable and justify more attempts next spring.

The bulk of our spring propagation remained true softwood cuttings. The results were very satisfactory and the growth of the plants over the summer has been consistent with 1984 results.

In conclusion, this method of preseason propagation has many benefits. First, we are able to rapidly increase production of a new cultivar by taking additional crops of cuttings in one season. Second, we can reduce start to finish production time on some species. Third, we lessen risk by overwintering large plants instead of small cuttings. Finally, we produce a crop that finishes usually in late spring, after the shipping of normal sequence plants. This allows us to offer a more consistent product.

JIM SAMPSON: Is there any hardening off after coming out of the mist?

BRIAN DECKER: The critical factor is that after potting the rooted cuttings are always shaded and that gives them about a week to get moving.

DALE HENDERSON: Was your material forced or was it outside spring growth?

BRIAN DECKER: The timing was a little deceiving this past year because of the early growth. All the cuttings came from container stock overwintered in white poly houses.

CHARLES HILDERBRANT: Did you use any bottom heat?

BRIAN DECKER: They were propagated in a greenhouse that we use for our hardwood propagation. We propagate in flats so we were able to move things such as junipers out of the house. The heat was the normal setting we use in our greenhouse. There may have been some bottom heat on the colder nights.

### **Tuesday Afternoon, December 10, 1985**

The afternoon session was convened at 2:00 p.m. with Peter Orum serving as moderator.