year may fail the following year. As the stock trees get older, the timing changes by several weeks. The amount of rainfall over the summer; the amount of sunny versus shady days; and the temperature all have a varying influence. In our locality it is best not to take cuttings until after the first major frost in the fall. Excellent records must be kept of all pertinent data and any changes in scheduling or procedures should be noted.

SOFTWOOD CUTTING PROPAGATION OF CERTAIN SHADE TREE SPECIES

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Softwood cutting propagation of deciduous trees is relatively new to the nursery industry. In the past most tree cultivars were produced by budding or grafting. This is still the most common method of propagation for most cultivars. However, this has created some problems. Notably delayed incompatibility in certain red maples. To circumvent this problem it has been necessary to find other methods of propagation. In 1976 Femrite Nursery began to experiment with rooting red maple softwood cuttings. This was done by placing the prepared cuttings in a flat for rooting under mist. The resultant rooting was adequate, but we lost many of our cuttings when we transplanted them to pots for overwintering. We began to look for some method to root the cuttings without having to transplant them.

After much trial and some error we have developed a method of propagation which works well for us. We now use a McConkey pot which is 2¼ in. square by 5 in. deep. We can put 49 of these in a 17 in. square mesh bottom flat. The flats are filled with pots and the pots are filled with a medium of 60% horticultural grade perlite and 40% aged sawdust. This medium gives good drainage while insuring adequate water holding capacity. The flats are then placed on the benches under mist.

The cuttings are taken, beginning in early July, from the stock garden or field stock. They are plunged in water immediately upon cutting to maintain their turgor. The cuttings are then brought into the warehouse where they are kept cool and damp until they are prepared for sticking. We make the cuttings 6 to 10 in. long depending on the cultivar and amount of scion wood available. One or two leaves are left on the cutting

and the base is cut flat and wounded on both sides. The prepared cuttings are then taken to the greenhouse, treated with a rooting hormone, and stuck in the prepunched pots.

The cuttings are taken during the hot part of the summer and are placed on unheated benches where they are misted as often as necessary to insure they do not dry out. They usually callus and begin to root in 10 to 14 days. The speed of rooting depends on the cultivar and, to some extent, the maturity of the wood. Most of the maple cultivars root quite rapidly while the cherries and plums callus fast but root more slowly. We are rooting cultivars of red maple (*Acer rubrum* 'October Glory', 'Armstrong', 'Karpick', and 'Northwoods'); plum (*Prunus* × blireiana, *P.* × *cistena*, and *P. cerasifera* 'Newport', 'Thundercloud', and 'Vesuvius'); flowering cherry (*Prunus serrulata* 'Kwanzan' and 'Mount Fuji', *Prunus subhirtella* 'Pendula Plena Rosea'); and *Betula nigra* 'Heritage'. We expect an 80%, or higher, rooting on all of the cultivars except the 'Heritage' birch which does not root well. (We are also trying several other new cultivars this year, but do not have the results yet).

The rooting percentages are high enough to warrant rooting the cuttings directly in individual pots. As the season progresses we go through the flats culling out any dead cuttings and consolidating them. In late fall the cutting flats are transferred into poly houses where they are held through the winter. In the spring they are removed from the houses and planted in the field along with our seedlings. We have built a single row planter to handle the potted cuttings. The square shape of the pot forces the roots to move up or down in the pot rather than wrapping around it. Once planted the roots move out into the soil in a normal manner, giving us the type of root formation we are accustomed to. Once planted the cuttings are treated in the same manner as the budded seedlings.

Softwood cutting propagation has allowed us to increase our production of shade tree cultivars, (which grow as as well from cuttings as they do from budded seedlings) but have the advantage of being on their own roots. We are continually trying new cultivars by direct sticking. We feel that the only reason not to produce plants in this manner is if they do not root in high enough percentages to make it profitable. We are pleased with our success but we are continually striving to improve our timing and methods to increase productivity.