3 weeks after budding. If they are not cut, they will rapidly be overgrown by the expanding seedling bark and late wind storms will snap off the seedlings. Understocks are normally cut back in January or February and the buds sprout the following late April. Linden seedlings, especially those of *Tilia cordata*, sucker abundantly form the base, and the young budded trees should be suckered several times during the first summer after cutting back. Final bud stands are greatly enhanced by inserting an inexpensive 3 or 4 foot light bamboo cane into the ground beside the understock and tying the scion sprout to it in several places to prevent blow-off in thunderstorm gusts. Also, tying to a stake or using Frank Schmidt's "Grow Straight" irons will produce far superior trees because linden buds tend to grow out horizontally for a few inches before bending up, thus causing an unsightly bow in the trunk.

As noted earlier, scion-rootstock compatibility between linden species is critical. Thus, *Tilia cordata* will grow on *T. cordata* or *T. vulgaris* (*T. x europaea*) understocks and vice versa. *Tilia x euchlora* will grow on *T. cordata*, *T. platyphyllos*, or *T. americana*. *Tilia americana*, *T. platyphyllos*, *T.x euchlora 'Redmont'*, *T. tomentosa*, and *T. petiolaris* will all grow on seedlings of *T americana*, *T. platyphyllos*, and *T. tomentosa*. Curiously enough, although *T. cordata* and *T. platyphyllos* will hybridize (thus producing *T.x vulgaris* or *T. x europaea*), neither will grow on the other as an understock.

PROPAGATION OF CERTAIN *CHAMAECYPARIS* CULTIVARS AND OF *ACER JAPONICUM* 'ACONITIFOLIUM'

E.A. DIXON, JR.

Dixon Tree Farm & Nursery
Glenmoore, Pennsylvania 19343

In general, all Chamaecyparis cuttings were stem cuttings stuck in sand with a bottom heat of 70 to 75°F. Air temperature was maintained generally at 55 to 65°F but reached 80°F on sunny days. Cuttings were kept under intermittent mist 12 seconds every 6 minutes controlled by a photo-electric switch set so that a misting occured only when cuttings were subject to direct sunlight. All cuttings were taken after the first hard frost; that is, in November and December in Pennsylvania.

Chamaecyparis obtusa 'Nana Gracilis'. Cuttings were taken from tips of terminal or lateral stems and were approximately 10 cm long. As this cultivar has a tendency to revert to the species, care must be taken to insure that no cuttings are taken from

shoots that are reverting In order to have cuttings of workable size, the basal portion of the cutting includes older growth. A 1-1½ cm wound is made on one side of the cutting, which is then treated with 0.8% IBA talc (Hormodin No. 3).

Chamaecyparis pisifera 'Filifera Aurea' and *C.p.* 'Aurea Nana'. 'Filifera Aurea' and 'Aurea Nana' are treated alike except that cuttings of 'Filifera Aurea' are taken from only those stems which show a definite tendency to grow upwards rather than laterally or down. This procedure is designed to preclude the possiblity that the rooted cutting would grow too wide in proportion to its height. A 1-1½ cm wound is made on one side of the cutting. The cutting is treated with 0.3% IBA in talc (Hormodin No. 2). Cuttings should be sufficiently rooted in 90 to 100 days to be pulled.

Acer japonicum 'Aconitifolium'. This work was based on an article by James Wells on rooting *A. palmatum* (1) on the hypothesis that what worked for *A. palmatum* may very well work for *A. japonicum*. It did. Work was done on both *A. japonicum* 'Aconitifolium' and *A. japonicum* 'Aureum'. While some progress was made rooting 'Aureum', further work must be done.

Stock plants were received and potted up in March and maintained in a heated greenhouse, and drip irrigated with N-K injected into the irrigation system during the growing period. Cuttings were taken the last week in May through the first week in June, from the tips of new growth which were semi-hard: green on one side of the stem and reddish green on the other. In many cases, a second flush of growth had started at the time the cuttings were made. Most cuttings were 6 to 10" long and contained from 1 to 4 nodes. However, having a node in the sand was not necessary for rooting. Larger cuttings tended to root better than the smaller ones. A 2 to 3 cm wound was made on one side and the cutting dipped in a 2% IBA talc powder (HormoRoot 2). All cuttings were stuck in sand under intermittent mist with bottom heat set at 70 to 75°F, although the heat rarely needed to be on. The air temperature was 60 to 90°F, the house being under 55% shade.

Cuttings had ½" or longer roots in 30 to 45 days after sticking at which time they were removed from the sand and potted in rose pots. The pots were then returned to the mist beds until the roots reached the bottom of the pots which took approximately 2 to 3 weeks. At this time the cuttings were removed from the mist, potted up to 1 gallon containers, and fertilized. In addition, one leaf was removed from the bottom node if a leaf was not already missing from the node

After removal from the mist the rooted cuttings were maintained in a greenhouse and placed under incandescent light of

over 200 foot candles from 8:00 p.m. to midnight. For reasons totally unrelated to the experiment, the plants were removed from the supplementary light at the end of July for several weeks. Intermittent supplementary incandescent lighting was then resumed at 200 to 2000 foot candles, for 15 minutes out of every 45 minutes from dusk to dawn. By mid-August there was new growth on most, but not all of the rooted cuttings. Some of the plants continued to grow until the end of November, after which time all growth seemed to stop and gradually the leaves began to assume their fall color, despite the intermittent supplementary lighting. The temperatures in the greenhouse during the fall ranged from 50 to 80°F.

Preliminary indications are that a minimum temperature of 55°F or more, together with supplementary intermittent lighting, is necessary to prevent dormancy. Furthermore, it is questionable whether supplementary lighting is necessary during long periods of daylight in the summer months. Cuttings that did not put on new growth after rooting did not survive the winter.

LITERATURE CITED

1. Wells, James S 1980 How to propagate Japanese maples. *Amer Nurseryman* 151 (9) 14, 117-120

PROPAGATING DECIDUOUS HOLLY

ROBERT C. SIMPSON

Simpson Orchard Company, Inc.
Vincennes, Indiana 47591

Deciduous hollies should be of interest to growers because to date they have been overlooked as a valuable ornamental. The three species most commonly available are *Ilex decidua, I. serrata* and *I. verticillata.* Publications of the Holly Society of America list 25 or more named selections of species or hybrids (Table 1), few of which are commerically available.

Most seedlings are slow to fruit well, approximately half are male and fruitless, and are quite variable. The named selections are vastly superior but few of these are listed in nursery catalogs or garden publications and rarely available. Few ornamental shrubs can surpass these deciduous hollies for effective fruit display. Properly promoted they could fill a need for fall and winter color in the landscape.

I have been interested because this group of plants has such great potential To date little has been done even to propagate