
Practical Rooting Trays

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We utilize the plastic bulb trays used to ship bulbs from Holland to North America. The bulbs are used in greenhouses for forcing and as it is too expensive to return the trays, they are sold here for \$3 (Cdn.) or less. The size of the tray is 60 cm × 40 cm × 18 cm (23.6 inches × 15.7 inches × 7 inches). All of our softwood propagation in the summer is done in these trays. They are filled approximately 9 cm (3.54 inches) with perlite. Depending on the leaf size of the cutting, the trays contain 150, 95, or 75 cuttings.

The cuttings are made about 13 cm (5.1 inches) in length making sure that they do not stick out over the top of the tray. This makes it easier to stack them later. Cuttings are treated with 0.8% IBA powder. Misting is controlled by an electronic leaf sensor. After rooting the cuttings are hardened off.

In November after the leaves have fallen off and the cuttings have been treated with a fungicide, the trays are stacked up to 12 high in a cold storage at 1C; they will remain there until approximately the end of May.

The advantages to using this system are:

- 1) Inexpensive durable trays;
- 2) Highly mobile;
- 3) Light weight;
- 4) Due to the bottom perforation of the trays the cutting roots are air pruned.

Innovation in Propagation

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INTRODUCTION

How do you recognize a propagator in a crowd? Among other things, you look at his or her hands, and, on careful examination, you will see scars on their fingers from cuts made when they learned to graft and make cuttings. Upon talking to them further, you will hear of their successes of 200% rooting, and 120% catches!! But also, you will hear of their ongoing battles with certain plants and their undeserved failures.

At one time, we grew tree roses. In order to protect them during the winter, we would bend them down and cover the budded 1.25-m stems with soil. This was cumbersome, but if we could protect the buds from windburn, we would be successful in growing standard roses.

I started with a Kotex[®] pad, and eventually wound up with a bookmailer — a thick-walled Kraft envelope. The Kotex sanitary pad got a lot of laughs, but later on was used successfully as a moisture-carrying insert in the hot callous tube.

The Kotex pads come pre-glued. They are laid end-to-end on a pipe, and inserted

into the insulated hot-callous tube with the slots. The hot callous tube is laid on a slight slant, and water is poured into the end to wet the pads so that they will provide continuous humidity to the callousing graftings in the slots. Pads are sterile, and hold a fair amount of water. This method worked!

GRAFTING

Now, to grafting. We graft a lot — well over 100,000 pieces. You must start to look for improving grafting techniques to cut time, costs, etc.

Rather than tying the scion and stock, I stapled some. It worked, but it is still cumbersome. Then, presto! — an idea. Use Crazy Glue that hardens in seconds!

For the experiment, I used a hypodermic needle to get a very small droplet in the center of the scion cut. But it took too long to set. I called the 3-M Company, the manufacturer of Crazy Glue. They had an accelerator agent. It worked, but the scions didn't take! The accelerator chemical burned the cambiums. Even so, we should continue to look to the medical experts that graft our bones, as well as our dentists, etc. The idea is still good — no rubbers to use, no rubbers to take off.

Salix. Grafting our willows, i.e., weeping pussy willow and hakuro-nishiki willow, is a one-step process. We graft and root at the same time. Early in the spring, we gather sticks of *Salix viminalis* 1.25 to 1.80 m in length with a minimum caliper thickness of a pencil. We graft the tops with *S. integra* 'Hakuro-nishiki', *S. caprea* 'Kilmarnock' (syn. *S. caprea* 'Pendula'), and *S. purpurea* 'Pendula'. We use a polyethylene tape rather than rubbers to tie our scions. The graft is a simple whip graft (no tongue), matching at least one side. The grafted sticks are stuck as a cutting in a 5-gal pot. The cutting grafts are kept in a greenhouse at 20C until outdoor temperatures have warmed up, and then they are moved out. The grafts are next staked through the pot into the soil, thus preventing them from blowing over. They are watered with drip irrigation; willows take a lot of water!!

Aesculus × carnea 'Briotii'. We graft these onto 1-year *A. hippocastanum* understock growing in 1-gal pots. Because the scions are dipped in wax, the scion buds are sealed, and therefore, are slow to emerge. This allowed rot to set in, causing young emerging buds to damp off, and resulted in poor to mediocre takes. We solved this by capping top buds with aluminum foil before dipping, then removing the aluminum cap and allowing the plant to break through its natural "pitchy" coat.

Euonymus Standard. Standards are grafted on *E. europaeus* understock. We used to use seedlings for stems, but they took a long time (3 to 4 years) to get up to 125 to 150 cm. Kris Bachtell (The Morton Arboretum) sent me a selection of *E. europaeus* that is faster growing, and we are now using a fall-potted softwood cutting, grown on in 1-gal pots in a shaded greenhouse which gives us stems of 150 cm+ that are ready in 1 year! These are grafted with a 1-gal-pot rootball.

CUTTING PROPAGATION

Taxus. We root taxus, but, rather than using powdered NAA, we prefer soaking the taxus in a water solution of NAA Rhizopon B (200 ppm) for 24 h. We use a flat with 38 cells to keep the cuttings in an upright position in the water. Each cell contains a bundle of taxus cuttings. The advantage is it's faster! It's hygienic, there are no ties to use, no ties to cut, they're easy to transport, and easy to rinse off prior to sticking.

Our rooted taxus cuttings, or any other cuttings for that matter, are pulled out of the coarse sand medium and put into 2-gal pots which are transported on our roller blade carts ovetop the benches. The 2-gal pots are watered and easy to put on a planting machine or into the potting operation.

Prunus. We also root our *Prunus ×cistena* and *P. triloba* 'Multiplex' (flowering almond) in boxes in a mixture of fine sand, peat, and perlite. The plants are later field grown, for they do not like container overhead irrigation — they are prone to developing bacterial leaf spot (*Xanthomonas pruni* or shot hole). The cuttings are stuck in fruit boxes, approximately 50 cm × 50 cm × 40 cm in height, containing ¼-inch drainage holes. Cuttings are sprayed with Agrimycin for the leaf spot. The boxes with rooted cuttings are fertilized with 20N-20P-20K liquid fertilizer and grown on to a height of 50 to 60 cm. Rooted cuttings are hardened off and mowed with a sicklebar pruner — levelled down to box height — then leaves and debris are blown out. They are then sprayed with a fungicide and stacked on pallets to be stored in cold storage at 0 to -1C. In the spring, they are shaken out, bundled, and are ready to plant. They are watered only once in the winter while in cold storage. The plants store well, and take off like mad when planted in the field!

Picea. We annually grow *Picea glauca* var. *albertiana* 'Conica' (dwarf Alberta spruce) and *P. abies* 'Nidiformis' (nest spruce) from summer cuttings (described in another paper I gave). I would like to share with you the replacing of our old-fashioned wood sash with 6 ft × 4 ft sheets of double polycarbonate claddings reinforced with aluminum angles. There is no more painting, replacing of glass, etc., but as a bonus, plants are warmer in winter and cooler in summer at cutting sticking time.

Standards from Cuttings. We are now growing many shrubs as standards. This in itself is not a new concept. The difference now is they are container grown from start to finish. A rooted plug is potted and greenhouse grown till June when outdoor temperatures are equal to the greenhouse environment. At this point, they have already reached a height of 125 to 150 cm. They are staked — and will still continue to grow — and grown on for another season into a saleable small tree. For now, we have *Weigela* cultivars, *Cornus alba* 'Elegantissima', and pee gee hydrangeas, giving us even more variety in the small ornamental trees we produce. The pee gee, *Hydrangea paniculata* 'Grandiflora', standards along with *Hibiscus* standards bloom in late summer and into fall, providing beauty and color at a time when most other flowers have peaked.