

FIELD PROPAGATION OF SELECTED ORNAMENTALS IN NEW ZEALAND

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Duncan & Davies Nurseries are situated at Waitara, a few kilometres north of New Plymouth, on the west coast of the North Island. We have a temperate climate with an average temperature range of 10 °C in mid-winter to 18 °C in mid-summer. In mid-winter we would normally experience several ground frosts, of about -3 °C, and in summer the highest temperature would reach 28 °C. We have a total of 2,150 sunshine hours annually and a 60 in. annual rainfall, which is spread throughout the year. Soil type is a very fertile free-draining volcanic loam. We have a prevailing westerly wind which places importance on effective shelter in the nursery. The combination of favourable climate and soil type enables field production of hardy trees and shrubs to be a major part of our total nursery production. One of our specialised lines is the field propagation of budded trees and shrubs, of which we bud up to 250,000 plants annually, using approximately 200 cultivars over a range of 20 genera.

The plant species that I wish to discuss here are: *Acer palmatum*, *Cornus florida*, *Hamamelis mollis*, and *H. × intermedia*.

ROOTSTOCKS

The rootstocks used are *Acer palmatum*, *Cornus florida*, and *Hamamelis × intermedia*. All the rootstocks are seedling produced as this is still a relatively cheap method of producing large volumes. With *Cornus* and *Hamamelis* we plant out a one-year-old seedling of 20/30 cm grade. With *Acer palmatum* there is a large variation in seedling quality so we use a selected seed source which produces strong, one-year seedlings of 70/90 cm grade.

Ideally we like to plant out the one-year-old seedlings in late autumn to early winter. In our climate we get a substantial amount of root growth in this period which leads to stronger top growth in spring and summer. The rootstocks are planted out in single rows through black polythene mulch at 30 to 40 cm spacing. The polythene mulch has the following advantages:

It depresses weed growth around the plant.

The water-shedding effect keeps the soil around the root zone drier and warmer which encourages earlier bud break in spring.

It reduces soil splash on the stem of the rootstock where the bud is to be placed.

Any lateral growths on the rootstock, in the region where the bud is to be placed are removed one or two days prior to budding.

BUDDING OPERATIONS

The timing of budding with these species is very important for successful results. The importance is on budwood maturity when selecting current season's growth with the buds fully developed. A good indication of mature budwood is when the leaf petiole "snaps off" easily without damaging the bud or stem.

Acer palmatum cultivars are budded in the late summer period, from early January to late March, with *Acer palmatum* dissected-leaf cultivars budded mid-February to late March. The budding period for *Cornus* and *Hamamelis* is late January to early February. The growing season is usually long enough to allow two budding rounds if necessary. The sap flow of *Hamamelis* species slows down very quickly in early autumn so a second round must be completed by the end of February.

The budwood is collected from either the nursery row or from stock plants. It is collected in early morning prior to the day's budding. The leaves are removed and the budwood is stored in plastic bags of 35 micron thickness and kept in a cool shady situation.

All these species are chip-budded at 5 to 8 cm. above the base of the rootstock. With chip-budding it is important to try and match the bud size with the cut on the stem of the rootstock. A plastic strip is used to tie the bud in place. In our moist climate the plastic strip has proved to be the most effective compared to rubber types. For best results, weather conditions should be warm and dry at budding time. A skilled budder will chip-bud 800 to 1,000 *Acer* per 8-hr. day and 1,000 to 1,200 *Cornus* and *Hamamelis* seedlings.

After 4 to 6 weeks the plastic ties are removed. With *Acer* the percentage bud take depends upon the cultivar and can vary from 50 to 85 percent. The bark on some cultivars is very thin which makes budding difficult. With *Cornus* and *Hamamelis* we normally expect a 90 percent bud take.

TRAINING BUD GROWTH

The rootstocks are root-conditioned at the end of the first growing season, prior to heading back. The rootstocks are headed back to the live bud in late winter (late July through early August) and the cut is painted with an acrylic paint containing a fungicide.

Most *Acer* cultivars require a 120 cm. stake to train the bud growth with a straight stem. The majority of the red-leaf cultivars produce a strong single stem (up to 200 cm.) in the first growing season of the cultivar, which is then headed at 100 cm. to produce a branched plant in the second season. The majority of the variegated and green-leaf cultivars will produce a well-branched plant in the first growing season.

The *Cornus* cultivars require a 120 cm. stake to train a straight stem and they will produce a well-branched plant of 70 to 120 cm. depending on the cultivar.

With *Hamamelis* we like to produce a well-branched shrub from the bud union of 40 to 70 cm. depending on the cultivar. Staking is not necessary.

With all species, during the first growing season adventitious shoots (suckers) will appear from the rootstocks. These must be removed at an early stage or they will compete with growth of the budded cultivar.

At the end of the growing season the stakes are removed and the plants are machine wrenched with a reciprocating U-shaped blade which also lifts the plant slightly so they are easily pulled out for grading and bundling.

PESTS AND DISEASES

All crops are sprayed on a three-week cycle during the growing season with a general fungicide/insecticide mixture. *Cornus* and *Hamamelis* are prone to red spider mite so miticides are used from November onwards.

WEED CONTROL

Weed control between the rows is achieved with pre-emergence herbicides in early spring for grasses and broadleaf weeds, and another pre-emergence herbicide in early summer for summer grasses. Any additional weed control is by selective spot spraying.