

RESULTS

The 53 genera propagated at Stanley & Sons Nursery are shown in Table 1. Each genus has the month propagated, medium and hormone used, ratio of hormone, additional treatment, and percentage of rooted plants. In review, remember that some genera have multiple species. Each percentage is an extrapolation of all the species in that one genus. For example *Chamaecyparis* has five different species (*lawsoniana*, *obtusa*, *formosensis*, *pisifera*, and *thyoides*).

To restate, the focus of our production is to gain the highest possible percentages on our most popular taxa, while achieving sometimes lesser, but still acceptable results with the other varieties. The inventory need for some of these lesser taxa and rare genera is a part of our business that is not huge, but considered by us as our contribution to horticulture in preserving rare and unusual species.

TC or not TC[®]

Patrick Peterson

John Holmlund Nursery, 29285 SE Hwy 212, Boring, Oregon 97009

For those of you who are not familiar with our operation, we utilize programs of field budding, grafting, hardwood cuttings, tissue culture, and softwood cuttings for reproducing the various taxa of ornamental trees featured in our bare-root lineup. My focus is the greenhouse liner production, which supplies each of the satellite farms with various selections of trees like cherry, birch, elm, red maple, willow, and a handful of other types.

"TC" is a real head-turning acronym. TC is commonly associated with tissue culture, or the in vitro propagation of micro-cuttings. However, I also use TC to stand for tip cuttings or the style of cutting I prefer for the summer softwood program.

As most know, many taxa of the most commonly grown ornamentals are easily rooted from cuttings. Budding onto a vigorous root system is a reasonable way to reproduce selections of ash and honeylocust, but graft incompatibility issues influence the reproduction solely by cuttings for a species like red maple. When I started working at Holmlund's Nursery, there was already a program in place for raising the liner material in the greenhouse from cuttings and tissue culture plantlets. It was explained to me that the liners that are to be field-planted needed a well-developed root system and a stem hardy enough to overwinter outside. That meant that during the growing season the tops or tips of the plants were chopped off to help stimulate root development and reduce irrigation frequency. At the same time as the greenhouse foraging, the trees in field production were also having suckers cut away and branches trimmed up to facilitate a trained whip. Now, my wife will gladly vouch for me being a pack rat, but I've always seen myself as more of an opportunist. I just hang on to things until the opportunity arises. I see the opportunity at Holmlund's Nursery for us to make something from what is commonly discarded as field waste. Especially on the own-root crops and the new cultivars that our stock plant numbers are low on, a zero-waste cuttings program just makes sense. Now I need to be clear that our cuttings program is based on augmenting or complementing the quantity of plants grown from tissue culture, with the primary goal in mind of planting all container-grown plant material in the fall.

We approach our softwood cuttings program a bit differently than most others would. I produce tip cuttings, or cuttings with the apical bud included, in order to imitate the plantlets that are produced from tissue culture. A benefit of a tissue-culture-propagated crop is the presence of dormant buds close to the medium interface. These sets of buds low on the stem help eliminate an unsightly shank after the plant is foraged close to the ground for field production of whips. In comparison to our field foraging, I have created a cuttings program that pays attention to closely imitate the presence of future growth sites low on the stem or shank of the liner. A tip cutting, or rooted plantlet with that actively growing apical meristem is important in the program as it helps to eliminate the presence of a crook in the stem, which may deter from the aesthetics of even the bare-root end product. A rule of thumb I have when sticking cuttings is that the first set of buds on the stem should be no more than twice the distance than the cutting was pushed below the rooting medium. For example, if I stick a cutting 1 inch below the medium, there should be no more than 2 inches to the next set of buds up the stem.

Apart from the physiological similarities of the tip cuttings and the tissue culture plantlets, there are also similarities in the environments required to produce them. The acclimation of Stage III tissue culture plantlets and the production of tip cuttings both require high relative humidity, some heat, and correct light. There are many problems that a grower can encounter with respect to too much or too little of each of these three factors. Attempts at raising the relative humidity may lead to overwatering the crop. The soilless medium used for rooting or acclimating should provide adequate drainage. Too much light can cause a heat build up in the greenhouse environment, but this can be countered by using shade clothes or spray on shade compounds. The hardest to control element in our greenhouse environment is heat buildup. High temperatures create a real dilemma, as venting heat lowers humidity, and without a cooler or air conditioner, the inside temperature can only be lowered to the level of the outside air temperature. Most of the program takes place in the hottest part of the summer.

After an average of 3 to 4 weeks in tropical conditions the plants are ready to be hardened off, or acclimated to the Oregon climate. In the tip cutting production house, reducing the relative humidity and misting frequency on the crop initiate the process. To help stimulate the formation of wax on the leaves the overhead fans are run for short intervals. Eventually, the doors on each end are opened to let in outside air. Once the plants are acclimated to outside air conditions the sides of the house are rolled up. The shade clothes are removed from the tops of the house as the day length shortens and the light intensity from the sun decreases.

In 3 months time, we can root a cutting that will be able to complement the current years growth of tissue culture plantlets, and be equally ready for a fall planting and overwintering outside. It takes a propagator to root cuttings, but it takes a skilled propagator to pay close attention to the details in order to create an exact duplicate.