

Thirty-Five Years of Propagation in 30 Minutes: Tricks and Tips

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Summary

Van der Giessen Nursery is a 20-ha (50-ac) wholesale liner and container growing operation with a wide pallet of woody ornamental plants. We produce over two million liners a year. Our timeline for propagation begins in January and ends in December. We have five keys to successful propagation: 1. *use juvenile stock* -if limited to field grown material, it is best to coppice the material and take the resulting flush; 2. *proper nutrition and healthy stock are critical* - a nutritionally-stressed cutting will never make a good liner; 3. *know what growth stage is best to maximize rooting success*: softwood, semi-hardwood, or hardwood cuttings; 4. *know the optimal window of opportunity* to take successful cuttings; and 5. if you have correctly managed 1-4, then *optimize use of rooting hormones*. Recommendations are given on propagation of select species.

INTRODUCTION

Van der Giessen Nursery is a 20 ha (50-ac) wholesale liner and container growing operation with a wide pallet of woody ornamental plants (Fig. 1). We produce over two million liners a year.

The nursery began in 1990 upon the retirement of my father, Peter van der Giessen, as manager of Cottage Hill Nursery in Irvington, Alabama (Fig. 2). Two months after he “retired” dad called me to join him for lunch in Semmes, Alabama, a small farming community near Mobile.

Halfway through lunch he asked “What do you think about the old Lyons Nursery?” I told him it was a wreck, and had been abandoned for years. “Good: I bought it! Want to go to work!?” So, we began!



Figure 1. Van der Giessen Nursery is a 20-ha (50-ac) wholesale liner and container growing operation with a wide pallet of woody ornamental plants.

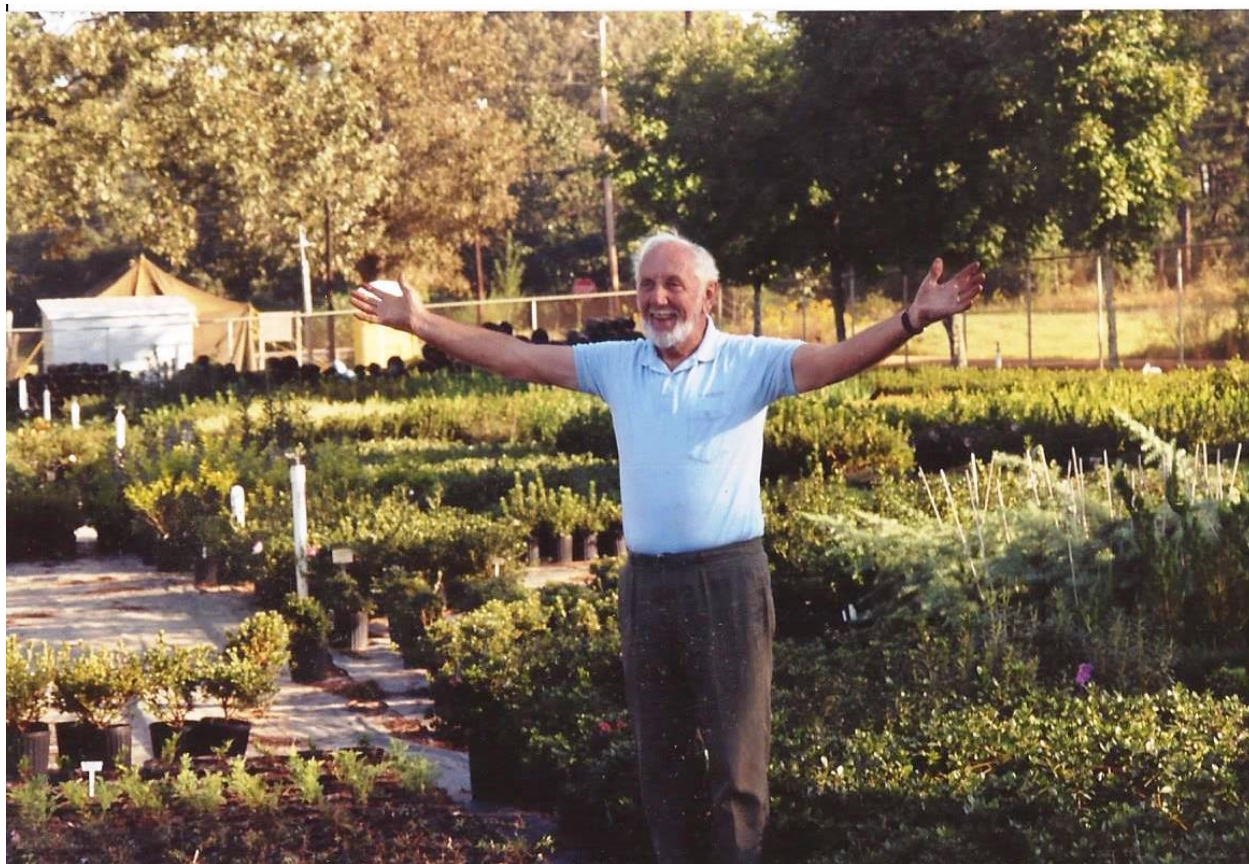


Figure 2. The late, Peter van der Giessen. He and son, Maarten, are the 1st father and son to be recognized as Fellows of the IPPS-Southern Region of North America!

Semmes, Alabama has been home to wholesale nurseries for over a hundred years. It has good soils, plenty of water, and access to rail; this attracted Kiyono and Sawada from Texas, and the Welch Brothers from Iowa to start businesses in Semmes during in the first decade of the 20th Century (Fig. 3). They spawned a nursery industry that thrives to this day. The friendship of the nurserymen in Semmes also makes it an ideal home for a wholesale nursery.

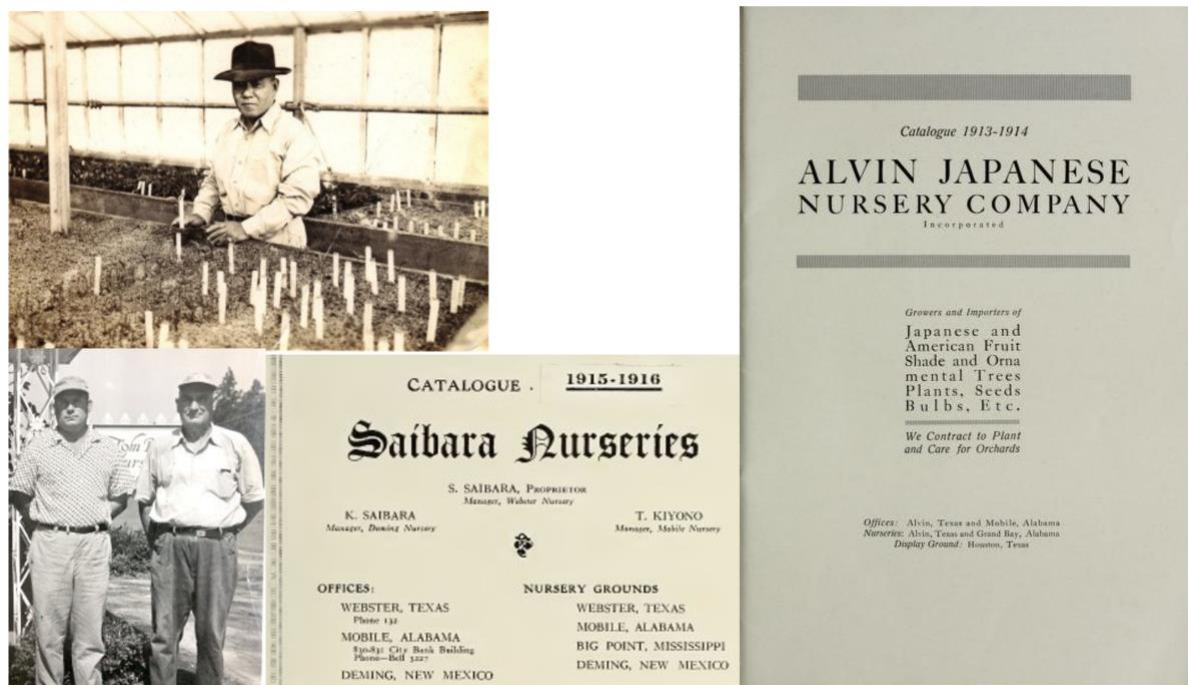


Figure 3. Early pioneers of the Semes, Alabama nursery industry: Kiyono and Sawada from Texas, the Welch Brothers from Iowa (bottom left), Saibara Nurseries and the Alvin Japanese Nursery Company catalogs.

MEDIA MIXES

Pine bark is still plentiful in our area. Our mix at van der Giessen is a 3 bark: 1 peat: 1 pine shavings - blended with lime, micronutrient, gypsum, and fertilizer amendments (Fig. 4). We like the pine shavings for propagation for two reasons. The shavings initially fluff the mix and provide improved drainage. As they break down, they act more like a peat, holding moisture and binding the media together.



Figure 4. Soil mixes. (left) The general soil mix of 3 bark: 1 peat: 1 pine shavings; and (right) for conifers, the mix is 3 bark: 1 peat: 1 pine shavings: 1 perlite.

PROPAGATION STRUCTURES

Our structures are typical 7 x 30 m (24 x 100 ft) quonset houses, which are popular in the area (Fig. 6). The mist system is run by Phytotronic 1626® timers throughout the nursery. We prefer the Phytotronic clock for its simplicity. A good philosophy is: “If your employees cannot operate it, then maybe you should not use it either”. It can be changed out in five minutes or less, and does not require a manual to operate. Our propagation sprinklers are either the Rainbird MaxiBird® or Senninger Wobblers® (Fig. 6). Both are sturdy, inexpensive, and reliable. We produce liners in 40 cell 1801 flats. A house holds 1100 trays – and 44,000 liner plants.



Figure 5. A 7 x 30 m (24 x 100 ft) shaded quonset house for propagation and rooted-liner production. Each propagation tray contains 40-cells 6 x 8-cm (2.3 x 3-in.) with 1100 trays per house - and 44,000 liner plants.



Figure 6. (left) Phytotronics 1626 Clock® controller (arrow) can mist up to 6-zones

<https://www.phytotronics.com/product/nova-1626et-6-zone-controller/> . (right) Our sprinklers include the Rainbird Maxi Bird® at 3-gal per minute, and Senninger Mini-Wobblers®.

There is no substitute for personal attention in propagation. No amount of sophisticated gadgetry will replace a good propagator. As a safety precaution, we hang two-sided plastic flags on our clock boxes. One side is green, the other side is red. We check our timers at 8:00 and, if all is well, we hang the green flag on the clock box. We check again that the houses are cycling properly at 10:00 and 14:00. At 16:00 we make one final round and take off the flag. If during the day an employee needs to turn off a house, they are required to flip the flag from green to red. We are all human! I cannot tell you how many times in 35 years I have seen houses turned-off. Here at van der Giessen - turning off a clock without red flagging it - is a capital offense. That five-cent piece of plastic has saved us tens of thousands of dollars.

Our use of poly in propagation has changed over the years. We use 55% white poly January through March (Fig. 7). While most nurseries propagate conifers in open beds, we prefer the greater control of moisture and temperature from white poly in overwintering houses. From April through October, we propagate under 55% saran with no poly. This method evolved in response to 2005's hurricane season culminating in Hurricane Katrina, which destroyed 125 billion dollars' worth of property on the Gulf Coast. We saw five hurricanes impact our area that year (Fig. 8).



Figure 7. Our Quonset propagation house coverings alternate from (top, left) 55% saran with no poly from April through October; (top, right) white poly from January through March, and (bottom) clear poly with 55% saran from October through December.



Figure 8. On 24 October 2020, Hurricane Zeta destroyed eight quonset houses.

A crew of four men can strip a plastic covered house and secure the plastic in 20 minutes. For fifty greenhouses that means it takes 66-man hours just to disassemble. It takes the same amount of work to replace the poly when the storm has passed. In 2005, we calculated that we spent one entire month pulling and replacing poly. The labor and materials were incredibly expensive. After 2005, we decided to try propagating under shade cloth with no poly. A crew of two can strip shade cloth in 15 minutes, cutting our labor by more than half. To our pleasant surprise we found that not only could we propagate without poly, but in some instances the plants were healthier.

Labor costs have increased by almost 70% in the past fifteen years. During the same period our pool of available labor has shrunk dramatically. Plant pricing in the industry has not kept pace with production costs. This has driven the industry to find ways to cut costs. At van der Giessen, we worked with Ellis Manufacturing to build a 15-bit drill-head for our potting machine capable of producing jumbo quarts (Fig. 9). We decided to move away from the traditional 1-gallon container for much of our production. A 190 m² (2000 ft²) greenhouse will hold 15,000 quarts in flats versus 5000 1-gal pots. Additionally, we can box and palletize the quarts to ship with our liners. This gives our customers an opportunity to step up new introductions directly to 3-gal containers at a competitive price with 1-gal pots.



Figure 9. (left) Ellis Manufacturing to build a 15-bit drill-head for our potting machine capable of producing jumbo quarts. (right) We can box and palletize the quarts to ship with our liners.

FIVE KEYS TO SUCCESSFUL PROPAGATION

Our timeline for propagation begins in January and ends in December (Fig. 10). We have five keys to successful propagation:

1. *Use juvenile stock.* If you are limited to field grown material it is best to coppice the material and take the resulting flush.
2. *Proper nutrition and healthy stock are critical.* A nutritionally-stressed cutting will never make a good liner.
3. *Know what growth stage is best to maximize rooting success:* softwood, semi-hardwood, or hardwood cuttings.
4. *Know the optimal window of opportunity* to take successful cuttings.
5. If you have managed 1-4, then *optimize rooting hormone applications.*



Figure 10. Proper seasonal timing of collecting cutting wood is critical in propagation.

DIVIDING CONIFERS INTO EASY AND DIFFICULT CLASSES

We divide our January/February conifers into two classes: easy and difficult (Fig. 11).

Chamaecyparis, *Thuja*, *Juniperus horizontalis* and *J. conferta* are generally easy to root. On the other hand, *Juniperus chinensis* 'Blue Point', *J. procumbens* nana, and *J. virginiana* can be difficult. We make sure to keep them separated from the faster rooting stock. A *Juniperus horizontalis* 'Blue Rug' will have rotted long before a *J. chinensis* 'Blue Point' has started.

Cryptomeria is always propagated in a dedicated house for the same reason. The key to rooting tougher conifers is not to over-water. We syringe those houses four times a day.



Figure 11. Dividing conifers into easy- and difficult-to-propagate species.

GRAFTING OF MAPLES

In February, we graft *Acer palmatum* and *A. japonicum*. We bring the understock into a marginally heated house [2-4°C (35-40°F)] in January. We use a side-veneer graft with grafting tape. We do not bag. We have a 90% success rate. We graft onto our understock at the second or third node above the soil. This gives us the opportunity to re-graft onto the same stock if the initial graft does not take. The key is to keep the graft union dry. Since the plants are dormant,

they do not require a lot of water. Once they begin to break dormancy, we hand water below the graft for three weeks until the graft has healed.



Figure 12. Grafting maples using the side veneer graft (right, arrow). Understock is brought into the grafting house in January.

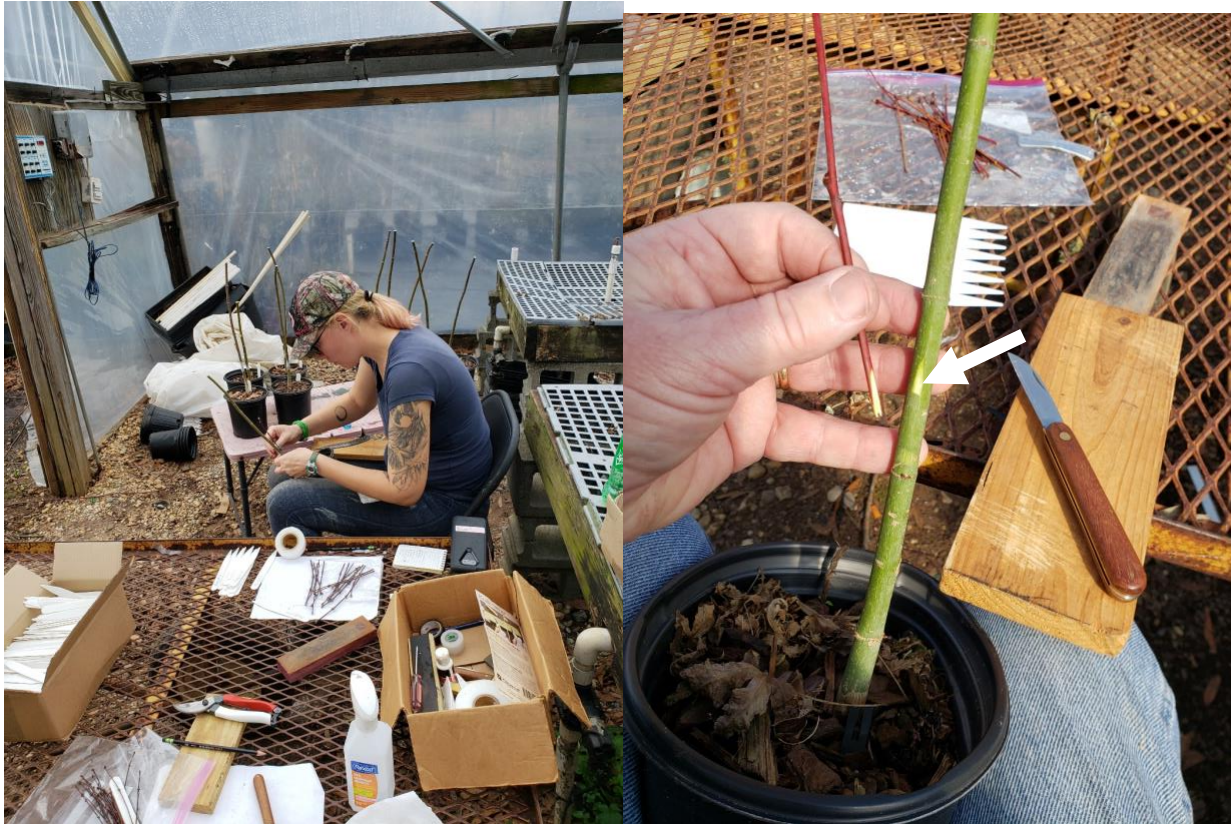


Figure 13. (left) Bench grafting maples using a side veneer graft (right, arrow). The darker, smaller scion piece is held in the grafter's hand.

MARCH: PROPAGATION OF CEPHALOTAXUS

In March we propagate *Cephalotaxus sinensis* (Fig. 14). We have found that we get better response if the stock is about to break dormancy. *Cephalotaxus* benefits from a 5000 ppm K-IBA quick-dip. The key to *Cephalotaxus* is patience. It is not uncommon for a crop to sit for three to four months before they begin to root in good percentages. We keep the house covered in white poly and syringe three or four times a day. We typically get 80% rooting, which is insufficient for liner production. So, this crop is later transplanted into quarts for sales.



Figure 14. Propagation of *Cephalotaxus* in March.

APRIL: A BUSY MONTH! MORE PROPAGATION

April is the toughest month. We are shipping like crazy and there are some plants that simply will not root in good percentages - if you do not use the first growth flush for softwood cuttings (Fig. 15). *Acer japonica*, *Rhododendron*, and *Chionanthus retusus* are all propagated as softwood cuttings. I define a softwood cutting as a 10-15 cm (4-6 in.) cutting that can be bent double without breaking. If you bend it end to end and it snaps, we consider it semi-hardwood. If a native azalea is semi-hardwood, then it is too late; rooting percentages will drop by 50%.

Additionally, we take deciduous *Ilex* species early. We get better rooting, and the rooted liner has more time to develop a flush of growth. As with native azaleas, an *Ilex* that roots but does not flush will have a difficult time breaking dormancy the following winter. We root lepidote and elepidote *Rhododendron* in April as well. They are another group that will sit for a long time under mist and then suddenly throw a pot full of roots. Be patient.



Figure 15. Propagation of deciduous azaleas which are quick-dipped with 1250 ppm K-IBA.

MAY: PROPAGATING WITH SEMI-HARDWOOD MATERIAL

By May we are getting into the semi-hardwood material, which is the bulk of what we propagate cuttings with (Fig. 16). This is a good time to propagate *Ilex vomitoria* by cuttings. Yaupon can be taken either early spring or early fall successfully. The key seems to be that it does not like extremes of hot or cold. Some nurseries use up to 10,000 ppm K-IBA with yaupon cuttings, but

my personal experience is to use no rooting hormone, or employ a mild (1250 ppm) quick-dip of K-IBA – for best rooting. Sodium salt IBA always burns the cuttings. Another plant that seems to respond well to propagation in May under saran is *Distylium*; we use 2500 ppm K-IBA with 95% success.



Figure 16. Semi-hardwood cuttings used to propagate (left) *Distylium* ‘Spring Frost’.

(right) *Ilex vomitoria* ‘Oscar Grey’ *Ilex vomitoria* and *Chaenomeles* require no rooting hormones, whereas *Berberis*, *Cliftonia* and *Distylium* are treated with 2500 ppm K-IBA.

JUNE: EVERGREEN AZALEA SEASON

June is evergreen azalea season (Fig. 17). We stick around 400,000 azalea cuttings a year. We no longer strip our cuttings nor cut the tips.



Figure 17. Semi-hardwood cuttings of evergreen azaleas are neither stripped nor quick-dipped with auxin.

JULY AND AUGUST PROPAGATION

July and August are our best months for *Viburnum macrocephalum*, *V. tinus*, and *V. opulus*. The larger Viburnums: *V. awabuki*, and *V. sandanqua* will root well - but overgrow a 40-cellpack before spring. Additionally, this is the best time to root *Myrica*, *Osmanthus*, and *Edgeworthia*. *Myrica* stuck early will become too leggy for spring sales. Later in the season it becomes difficult to root in good percentages.

SEPTEMBER PROPAGATION

In September temperatures fall back into an average range of 27°C (80°F). It is a good time to propagate *Ilex vomitoria* (Fig. 18). I find that *Fothergilla*, *Pieris*, *Illicium*, and *Leucothoe* also prefer the moderate temperatures. Our *Cleyera* seed is ripe in September. We discovered that rotting the seed in a mist house for three weeks after picking seed gives us much better

germination rates; but it is a stinky job to screen and wash them. We sow them in flats with no fertilizer with a light covering of perlite.

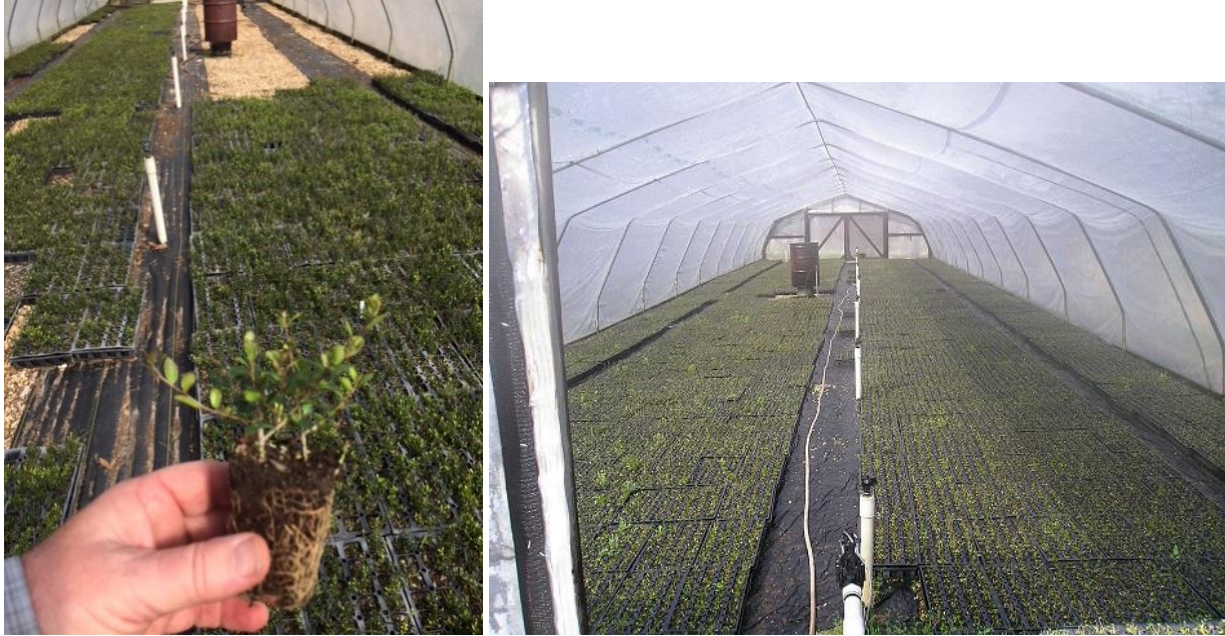


Figure 18. Propagation of *Ilex vomitoria*.

OCTOBER AND NOVEMBER PROPAGATION

By October and November - we are running out of time. Still, many plants will root if cuttings are taken up to the end of November. Loropetalum, Eleagnus, Buxus, Pittosporum, Michelia, and Podocarpus will root if cuttings are taken by or before the end of November.

DECEMBER PROPAGATION

By the beginning of December, we experience our first hard frosts. We can propagate laurels: Lauraceae. Then we start a new season all over again in January.