

In conclusion, we know that the procedures outlined are more time consuming than other methods, but we feel the product produced is more successful. We additionally feel we have a much greater control over our products.

Freeze Damage on *Taxus* Cutting Wood

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Recently, we experienced a propagation problem at Home Nursery when freeze damaged *Taxus* cutting wood was used. Historically, we have always taken taxus cuttings from field grown plants rather than the container grown ones. In the fall of 1990, we switched and began taking our cuttings from container grown plants because harvesting was easier and quicker due to closer plant spacing. In addition, because the plants were in covered polyhouses, the cuttings could be taken during bad weather.

Last fall we planned to compare the performance of cutting wood taken from containers with that from field plants. We began with cuttings from field plants and then proceeded to take them from the containers. However, in early November we experienced several days of record to near record lows. A record low of 8°F on November eighth was 7°F below the previous record on that day. At the time there were no visible signs of damage to the taxus and we were more concerned about the fate of some of our container grown broadleaved plants.

Problems began to appear in late December with the field cuttings in the propagation beds. Some cuttings were showing basal rot with many more exhibiting necrotic spots up and down the stems. Needle drop was also occurring. For a while we thought we might lose all of the field cuttings. As it turned out our losses from the field cuttings were 16% versus 4% from the cuttings taken from the protected container yews. The field cuttings also exhibited more uneven bud break this last spring. The following spring the longer shoots left on field plants die back to the body of the plant.

This near miss, so to speak, just served to reinforce something that we already knew—beware if anything changes, such as the occurrence of a freeze of this magnitude. In hindsight we should have made a conscious decision as to whether or not to use the wood from the field grown plants before we ever began to take the cuttings.

Overwintering Rooted Cuttings of *Viburnum carlesii*

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Viburnum carlesii, and its hybrids and cultivars, have typically been a high-demand and short-supply item at Wilson Nurseries. As a propagator, I'm sure I'm not alone in having been frustrated countless times by this plant. Numerous mistakes and many dead plants later, I have learned a few things about these viburnums which I would like to share.

At first, we tried in vain to make *V. carlesii* fit into a propagation schedule which we successfully used for most of the plants that we propagate. Softwood cuttings were taken in mid-June from plants in production. We made and bundled the cuttings in the field and stored them at 45°F prior to sticking. The cuttings were treated with 10,000 ppm K-IBA and stuck in sand in a 30 ft × 168 ft quonset house and misted with a Growing Systems mist boom.

By August, 90% or better were rooted. The plants were allowed to go dormant and were lifted from the sand beds in November. The dormant rooted cuttings were then wrapped in plastic and stored in a freezer at 28°F.

Coming out of the freezer in the spring, the roots and tops of the *V. carlesii* rooted cuttings looked alive and healthy. The plants were lined out in the field in April in 3-ft beds. The beds were irrigated immediately after planting and periodically thereafter. The results were less than satisfactory—30% stands for *V. carlesii*.

Through a couple more years of trial and error, we finally have come up with a method which, we believe, will consistently give us superior results. Cuttings are taken in June with the same treatment prior to sticking. However, this time the cuttings are direct stuck in 3-in. pots in a peat-bark mix. Instead of an unheated quonset, they are rooted in a 30 ft × 200 ft, double-poly, heated quonset house. As before, a Growing System boom is used to mist the cuttings, however, one must be much more careful with the water because the peat-bark mix tends to waterlog.

After the cuttings have rooted, they are grown on and allowed to go dormant in the fall. They are then left in place and maintained throughout the winter at 28°F. The following spring the plants are allowed to break bud, grow, and are cut back once prior to planting in the field in May.

I repeat, the returns we have experienced have been excellent. Furthermore, I believe these results can be duplicated year after year.

Feeding Cuttings to a Slow Death

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Everyone has experienced those mysterious overwintering deaths that occur in seemingly healthy stands of rooted cuttings. It's easy to rationalize what caused the problem without ever really rooting out the source so as to prevent it from happening again. We faced that situation this year at Spring Meadow Nursery. Cuttings flushed and then the new shoots collapsed within a very short time. Lab reports said that no pathogens were present, but there was considerable cambium damage. The question we had to answer was "how?" or if it happened again "how would the nursery survive economically?"

Certain patterns showed up with the problem. Plants that had been stuck or potted in the last half of the year showed the most loss, but only the ones in bark media. Cuttings stuck in perlite overwintered fine, for example *Euonymus alatus* 'Compactus' were rooted in perlite and then upgraded to 2¼-in. pots in mid-September using a pine bark medium. Overwinter losses with the 2¼-in. pots were about 50%, but the ones that remained in the plugs had virtually no winter losses. Other examples are *Spiraea japonica* 'Little Princess' and *Viburnum plicatum* f. *tomentosum* 'Mariesii' that were direct rooted in a 2¼-in. pot, then shifted to a 4-in.