Christmas Trees:
Selling Truly Living Trees - Versus - Trees That Were Once Alive.

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Some things are difficult to change, while others are nearly impossible. One I now put in the near impossible category is the concept that in order to have a Christmas tree, a live tree must be cut and sacrificed for the season. The producers of Christmas trees continue to cut trees and lament the decline of customers, and resist change. A recent editorial in the American Christmas Tree Journal lamented the fact that sales of cut trees were stagnant or declining and sales of plastic trees were up. To me, that is no surprise at all.

People do not want to kill trees, plain and simple. I believe the purchasing public would embrace a program of truly living Christmas trees that have a reasonable chance of survival when planted into the landscape somewhere – anywhere at the end of the holiday season. If there is no space in their landscape, the trees could be given to local municipalities for landscaping parks and other areas. Or truly living trees could be leased to customers for the period from just after Thanksgiving to after New Years. Delivery and pick up and replanted in the nursery, seems an obvious marketing technique. There are a variety of other options if the imagination is unleashed from the old traditional way.

A Different Approach

As a researcher with a life long fascination with trees, long ago I began to search for ways to have a truly living Christmas tree and one that remained alive following the holiday season. Since the early 1980's our home has been decorated with such a tree.

In one case I brought an Atlas cedar, *Cedrus atlantica*, in for about five weeks, then in early January planted it back into the landscape, then brought it in for a second year. By then it was too large to hold for a third cycle, so was planted permanently. Others used as truly living Christmas trees include Spruce pine, *Pinus glabra,* loblolly pine, *Pinus taeda*, Virginia pine, *Pinus virginiana*, and one year, a dense Carolina cherry laurel, *Prunus caroliniana*.

Most of these were grown in 12 or 14 inch knit fabric containers in the ground. Harvesting the trees in late November, then planting either back into the field or landscape in late December or early January, has worked well. The trees have remained dormant during the four to six week period and with zero leaf drop or signs of stress. Because a well developed root system is present, dehydration is not a problem and under our conditions, about a quart of water per week was all that was needed to keep the plant moist.

I should note that all of these trees were propagated from seed in RootMaker® containers to stimulate root branching and have the most fibrous root system possible. The trees were grown in the knit fabric containers in the ground, with the fabric containers filled with field soil. The 12 inch diameter size was filled about 12 inches deep and with moderate moisture weighed roughly 100 pounds. These trees were easily transported into and out of our home using a simple wheeled dolly (Figures 1 and 2). Because of the fibrous root system and weight of the soil ball, no Christmas tree stand was needed, plus the tree limbs were raised a reasonable level above the floor for placement of a decorative skirt over the root ball and allow room for presents.

The longest I have had conifer trees indoors is six weeks or just after Thanksgiving to after New Years day. None of the species used showed any signs of bud swell or growth and all were successfully moved back outside following the holidays. In addition, with the arrival of spring, all made a normal flush of growth which was further confirmation that buds were not damaged or had begun to be active while in the indoor environment. The plants stay dormant because day length is short, even with indoor lighting, and light intensity is low compared to normal outdoor conditions.

Figure 1. This spruce pine, Pinus glabra, was about 6 feet tall when harvested. However, with the additional 12 inch height of the root ball, the tree functioned as about 7 feet tall. The trees had not been sheared to increase branch density as would normally be the practice when sold for Christmas trees. In this case harvesting was by simply inserting a flat blade shovel in the ground around most of the root ball and to the depth of the bottom and prying the tree from the soil. Harvesting took only a few minutes, including knocking off any soil on the outside of the knit fabric.

Growing Christmas Trees Pot-In-Pot

When I came up with the concept of growing trees pot-in-pot, in 1973, student Charles Hogan and I were very optimistic (Producing Container Nursery Stock in the Field. Okla. Ag. Exp. Sta. Research Report P-704, page 43, Oct. 1974). The plants started off fine, and then when rains came they all died. Our test soil, although productive otherwise, did not drain well enough to prevent root suffocation. It was not until years later that others would pick up the idea and make it work in well drained soils. Pot-in-pot production provides a number of benefits, particularly in colder

climates. However, two major problems with pot-in-pot have been root escape from the production pot down and around and out drain holes in the socket pot, making harvest nearly impossible. In addition, when production pots were smooth conventional containers, root circling was severe and a high proportion of the roots were pressed against the inside of the container wall, making them particularly susceptible to death by heat when harvested during summer and damage by cold when harvested in winter.

Figure 2. Rootball of the spruce pine in figure 1. The ball was lifted and placed in a 3mil plastic bag to conserve moisture and provide a clean unit to transport indoors. Ears of the poly bag were tied loosely around the stem. This allowed easy opening and closing for adding water during the indoor stay.

Research to the Rescue

One of my inventions called the RootTrapper® (Patent #7,810,275) is a fabric laminated with a white poly coating securely bonded to the outside. Containers constructed of this material trap root tips when they contact the container sidewall. When a root tip is trapped, the tip swells, something like a match head, looses its dominance, then secondary branch roots develop back from that point for about four inches. These containers have worked very well above ground and being white are 20 degrees or more cooler than conventional black pots and conserve considerable water (Solutions for Pot-in-Pot Root Escape, Root Circling and Heat Shock at Harvest, CEW and ACW, Proc. Int. Plant Propagators Soc. Vol. 54, pages 573-578, 2004 and Temperature Control and Water Conservation in Above-Ground Containers, CEW and ACW, Proc. Int. Plant Propagators Soc. Vol. 56, pages 588-594, 2006)

After considerable success with the RootTrapper® material, we made production pots of a specific size to fit into socket pots in the ground. We grew an assortment of trees including conifers in the study for two growing seasons. Roots of all species grown in smooth walled conventional pots circled and grew out the drain holes and escaped making harvest difficult (Figure 3). However, production containers made of the white RootTrapper® material had no root escapes by the conifers and only a few slender roots extended a few inches through the stitched seams by the aggressive roots of green ash and lacebark elm. For growers with soils that drain well enough to allow pot-in-pot production, this is an excellent way to grow living Christmas trees. One note of importance, I strongly urge the use of squat pots as the socket pot versus the tall slender 15 gallon shown in Figure 3. The broad-flat bottomed squat pot allows the tree to stand up on its own nicely, whereas the tall slender 15 gallon shown was prone to falling over.

Figure 3. All pine trees grown in smooth walled pots had severe root circling and root escape at time of harvest. By contrast, all pines grown in the white, RootTrapper® container had no roots escape, plus when the RootTrapper® container was opened, masses of fibrous roots were present and no roots circled.

Do Not Sell a Pig-in-a-Poke

Selling 'living' Christmas trees that were grown traditionally and harvested balled-in-burlap is not a good practice. The balls are too large and heavy, and there are too few roots in the soil ball to sustain the top. Poor performance or death of Christmas trees due to poor root systems will promptly kill the market.

We did a comparison of balled-in-burlap trees with trees grown start to finish in the RootMaker® system (Figures 4 and 5). We purchased trees of similar stem diameter to trees we had grown, and then examined the root system. The trees purchased balled in burlap had few roots inside, whereas the trees grown in the RootTrapper® containers had masses of fibrous roots. We did not weigh the two root balls, but the soil ball was estimated to be at least three times the weight of the container.

Roots are the key factor in plant survival and performance. Roots have long been ignored as, out of site, out of mind, or essentially so. If you want improved performance in your plants, look to the root system. But it is important to note that you cannot go back and turn a tree propagated in ground beds or in plug type trays into a fibrous root system. You must start at the beginning when the seed is germinating and the initial development of secondary roots at the root-stem junction is at peak responsiveness. (For details, read, Plant Production in Containers II, by CEW.)

Truly living Christmas trees with a high likelihood of success can be grown in three ways;

1. knit fabric, in-ground containers.
2. pot-in-pot using RootTrapper® containers for optimum root development.
3. RootTrapper® containers above ground where winters are moderate such as in hardiness zones 7 -9.

Opportunities exist for those with the willingness to sever ties with the old traditional way of killing trees for holiday sales and doing some creative marketing.

Figure 4. The balled-in-burlap ash tree on the left was purchased from a commercial nursery. The shumard oak on the right was propagated in a RootMaker® container, shifted to a RootMaker® three gallon, and then transplanted into this 30 gallon RootTrapper® container. Both trees were about 2.5 inch stem diameter.

Figure 5. Few roots were present and almost no fine fibrous roots were found when the soil was washed away from the ash tree on the left. By contrast, masses of fine fibrous roots and active white root tips were present when the white RootTrapper® container was removed.