PLANT PRODUCTION USING A ROOT CONTROL FABRIC CONTAINER

CHRIS THREADGILL

Forrest Keeling Nursery
Elsberry, Missouri 63343

Root Control fabric containers offer many advantages over the traditional methods of producing specimen-size trees; these include: 1) ease of harvest, 2) extension of harvest season, 3) elimination of expensive harvest equipment, 4) utilization of unskilled labor, 5) use of higher plant densities, and 6) improved survival.

Root Control fabric containers evolved from an idea of Dr. Carl Whitcomb, Stillwater, Oklahoma. The objectives were to devise a system of growing that would allow for quick harvest of specimen trees, build a superior root system and be simple to operate.

In 1980, after learning of Dr. Whitcomb's idea, Ralph Reiger of Oklahoma City, Oklahoma, had fabric containers made from a spun-bonded fabric material. The fabric containers' measurements were 16-in., 18-in., and 22-in. in diameter, with an 18-in. height and a fabric bottom. After some of the trees were harvested two years later, it was apparent that the fabric bottom was not necessary and complicated harvest. It was subsequently replaced with a disk of heavy polyethylene.

Girdling of each root where it grows through the fabric is the factor that makes plant production in Root Control fabric containers significantly better than the classical means of producing specimen trees. This should not be confused with spiraling roots, which occur in rigid containers above ground.

Root girdling occurs every time roots grow out and through the fabric container. Small roots have no difficulty penetrating the fabric container. As the root begins to enlarge in diameter, the fabric restricts the root. This restriction or girdling brings forth the advantages of the Root Control fabric container.

The restriction is never complete. Absorbed nutrients and water from outside the fabric container still move in, just as a small amount of carbohydrates manufactured by the plant can move out. Because of restriction at the fabric interface, flow both ways is reduced and accumulation occurs, especially on the inside of the fabric container.

The plant's root system responds to the girdling in a desirable way. Additional roots initiated within the fabric container are eventually girdled, resulting in additional root formation and an extremely fibrous root system.

The ability to harvest plants grown in fabric containers quickly is due to root girdling as well as to the fact that the plant's roots are

already "packaged". The harvester simply inserts a standard balling spade outside the fabric container and cuts the roots the entire depth of the container. Root Control fabric containers have a polyethylene bottom, so once all the lateral roots have been cut, the harvester simply pulls the plant up by the trunk of the tree. Average time to dig on a per man, per plant basis, is five minutes; thus the objective of rapid harvest is realized.

The ability to extend the harvest season was not considered while developing the fabric container system, although this is one of the major advantages of the system.

On August 3, 1982, nine trees (three *Betula nigra*, three *Pinus taeda*, and three *Fraxinus pennsylvanica*) grown in fabric containers for two years were dug and transported to the Oklahoma State University Nursery Research Station to evaluate their response to this season of harvest. All plants had stem calipers of about 2½ in. The following day the fabric containers were removed and the trees were planted. All trees were watered-in thoroughly, and received an additional inch per week when Mother Nature did not provide. It is important to note that temperatures exceeded 100°F both days, with 10 to 20 mph southwest winds. All trees survived and grew well. Only one river birch dropped 5 to 10 percent of its foliage. Seven weeks later, one of the river birch was redug and the root system evaluated. New root growth in excess of 16 in. was observed. It was possible to grow a 6-ft. Aleppo pine, *Pinus halepensis*, from a liner in less than two years.

This rapid regeneration of roots from the girdled root allows an extended harvest season. The plant, once harvested, does not have to heal large cut roots first, and then generate new roots, as is the case with classical methods of production and harvest. The fabric container-grown tree's roots are, in a sense, already healed and in a condition to produce new roots immediately.

Do not confuse the terminology used. Root girdling is an undesirable condition, whereas these are girdled roots. It is girdled roots that provide the merits of the fabric container.

We follow the same routine in land preparation for the fabric container production as we do for the rest of our field-grown plants. We feel there is no substitute for raw chicken litter incorporated into the soil followed by a crop of sudan grass, which is then turned under. However, I feel one would have satisfactory results with any decent soil.

We space plants 4 feet apart in the row with 8 feet between rows, which gives us a plant density of 1361 trees per acre. A fiberglass cylinder is slipped inside of the container before it is placed in the planting hole. The cylinder keeps the bag open while it is being filled and slips out easily once the soil has been added. The bags we are using are 16-in. tall. Larger sizes are available but are much harder to harvest because of added weight.

It is extremely important not to cover the top of the bag with soil as the fabric above the soil is what you must use to harvest the plant. We leave a 1½-in. collar. We can easily drill 950 planting holes a day, which makes the system very efficient. Our cost for planting 25,000 ft. of trees is about $10,500.

It takes us only 3 min. to harvest a 6-ft. pine. We remove about one inch of the soil, then fold the edges of the bag over the top and wrap the ball with twine. We ship only within a 50-mile radius but have not seen any indication that shipping would be a problem. We leave the plants upright and seem not to lose soil.

Although some nurserymen run a knife around the inside of the bag to help loosen the plant when removing the bag, it really isn't necessary. The knife doesn't cut the roots, just pops them loose. The roots are already girdled and do not need to be cut.

THE NURSERY INDUSTRY: WHERE ARE WE HEADED?

R. J. HUTTON

The Conard-Pyle Company-
West Grove, Pennsylvania 19390

GENERAL

Now that the rose is officially the floral emblem of the United States, I can say the nursery industry certainly has a rosy outlook!

I foresee a strong and growing demand for our products and services. In this I include all ornamental horticulture and floriculture. We are gaining more and more appreciation of and desire for all that plants and flowers can do for us in our daily lives both indoors and outdoors. Horticulturally, we are beginning to be a developed country.

I don't pretend to know what the future holds for our industry or any other. However, I can see the changes that have taken place in the years I have been a part of the nursery industry and can see the signs of future changes, which are likely to be much more dramatic on a year-by-year basis. These include:

1. **Computers.** Production operations as well as office administration and management functions will be computerized.
2. **Plant Growth Modeling.** Better sensors are being developed and programs written that will make modeling commonplace.
3. **Mechanization.** Go to any of the major trade shows like SNA, TANMISSLARK, AAN, BPI, and others that attract