Innovations In Container Production

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Nursery container plant producers have been struggling with a number of chronic problems since containers were first introduced. A few of these include keeping water available throughout the day and the season, reducing labor requirements, minimizing water runoff, moderating temperature extremes in the root zone of exposed containers and reducing spread of water-borne pathogens. During the past few years several ideas have been tried as possible solutions to these problems.

In-ground containers were discussed at this meeting last year. Since that time a number of nursery producers and researchers throughout the Southeast have tried this idea and are pleased with the early results.

Other innovations have been subirrigation, Environmental Friendly containers, Soil Sock and the Poly-Jacket/Water Saver. Also, growers now seem more interested in automated potting machines.

Over the past two years I have worked with some innovative nursery producers who have developed special containers. During this same time, Dr. Ron Shumack and I were looking at a project that paralleled these individuals' efforts.

Our project was to demonstrate the effects of subirrigation, or collecting leachate in 2-in. saucers at the base of a container, vs. traditional irrigation. The idea was to show the possible detrimental effects of leaving plants in standing water.

However, we discovered that live oaks grown with a constant reservoir of water at the bottom of a container had a significant increase in growth (12.5 ft) over traditional drip irrigation. Shumard oaks showed no difference in either of the treatments (Tilt, et al 1990).

The importance of this finding is that both trees did as well or better in the saucers with a constant reservoir of water. With our current concern for water conservation and reduction of runoff, this was an enlightening observation.

Bob Rigsby, Rigsby Nursery, Fort Myers, Florida saw our article and called to discuss his experience with a similar idea. Rigsby has developed and patented a new container called Environmental Friendly Containers, or EFC His containers have raised holes on the side with no holes at the bottom. This has the same effect of creating a reservoir of water at the base of the container. He has tested the container and has reported the following benefits of EFC over traditional containers.

1) Increased growth
2) Reduced turnover due to increased weight
3) Reduced water requirements and reduced runoff
4) Elimination of rooting out
5) Possible reduction in water-transmitted root-rot fungi
6) Greater shelf life for retail store and reduced maintenance for interiorscapes

Rigsby has evaluated these containers in ground, above ground by themselves and using a container in a container to increase the water reservoir and reduce heat stress.

The "Soil Sock" was developed by Johnny Thomas, a nurseryman in Enterprise, Mississippi. It is a foam liner that fits into a wire basket and reportedly offers the advantages of root pruning, insulation from temperature extremes, ability to plant the entire container, and lower cost than the traditional containers. Fifty- and 100-gal Soil Sock containers sell for about $13 50 and $25, while 50- and 100-gal traditional containers sell for about $32 and $50.

The Soil Sock may possibly be used instead of burlap as the basket liner for B&B plants. Roots grow into the foam liner and are root pruned. When planted, the roots grow through the foam into the surrounding soil. The foam breaks down into a powder over time.

Dan Milbocker (1987) reported on the Low Profile container at the Southern Nurserymen's Association Research Conference A limitation was the problem of building and shipping the wooden boxes used for the containers.

We are currently evaluating these ideas at the Mobile Research Experiment Station using the following treatments· Containers in saucers of water maintained at a constant depth of two inches. The 20-gal traditional containers and the Soil Sock containers are part of the sub-irrigation treatment. The EFC container is compared with the subirrigation treatments since there is a two-inch reservoir of water at its base. Drip irrigation is supplied to control plants by Roberts 2-spot spitters (avocado, low-flow) in each container. All containers including the Low Profile container were supplied with an equal amount of medium.

The following information represents one year's data and should not be considered conclusive since the test is still in progress. Data was collected on height and caliper. Temperatures were monitored throughout the experiment.

No differences were found for any of the treatments for Bradford pear. This could be expected since this tree is tolerant of a wide variety of environmental extremes. The pecan had increased height and caliper in all the subirrigation treatments including the EFC container (Table 1). The foam container with traditional drip irrigation had the least growth. The large evaporative surface area may make it difficult to maintain adequate moisture. When the constant reservoir is added, the foam containers perform as well as the others. It appears after one year's data that growth increase is due to the greater availability of water in the three subirrigation treatments

Table 1. Effects of containers and irrigation on growth of pecan trees after one year

	Low profile	Control drip	Control subirr	EFC	Foam drip	Foam subirr
Height (ft)	5 8 bcd[1]	5 7 cd	6 4 ab	6 3 abc	5 4 d	6 6 a
Caliper (in)	1.0 bc	.99 cd	1 15 a	1 13 a	0.92 de	1 1 ab

[1]Means followed by the same letter are not significantly different at the 5% level (DMRT)

Weekly temperature data indicated that the Soil Sock did offer a reduction in

extreme summer temperatures over traditional containers but provided no insulation effect against low winter temperatures. Subirrigation treatments also resulted in lower summer temperatures but not as low as the Soil Sock. Average August temperatures were 101°F for the traditional black containers and 96°F for the subirrigation black containers and 91°F for the Soil Sock containers. It has not yet been determined if the reduced temperatures will result in increased growth.

Anderson Die and Manufacturing Company, 2425 S E. Moores St Portland, Oregon 97222, is just now marketing a container called a Poly Jacket. It consists of a thermal cone that snaps into one of two bases, the Water Saver and the Insulator. The cone offers insulation and stability and remains at the nursery when plants are sold The Insulator base keeps the 3-gal container above the saucer while offering insulation from extreme temperatures. The Water Saver base allows the container to sit in one inch of standing water. The 3-gal container is slipped down into the inverted cone, creating a dead air space designed to provide insulation. This container has not been tested, but trials will be set up this fall.

The Poly Jackets cost $2 00 each for quantities from 100 to 200, going down to $1.65 each for numbers over 5,000 According to the manufacturer, the products will last a minimum of five years.

One other exciting trend that has been long overdue is an increased emphasis in automation. Potting machines have been available for the greenhouse industry for several years. Last year two companies introduced potting machines for the nursery industry that will handle at least one-gal and possibly 2 to 3 gal in the near future. Due to the cost, we have not been able to evaluate these machines

The companies making the equipment are Precision Measurements, 553 E Pylon Drive, Raleigh, NC 27607, 919-755-0383, and Universal Fabications, Hillside, Vinegar Hill, Sandy, Beds SG191PR, England, 0767-680457, Fax 0767-691114. Precision Measurements produces the Air Pruning Transplant System, which requires the use of a bottomless inverted container propagation system to be compatible. Universal Fabricators produces the Fully Automatic Repotting Machine ($50,000-$60,000) that utilizes a cork screw extraction method from standard 4-in. containers

A number of new products and ideas for the nursery industry have been introduced. We need to continue our research with the support and cooperation of the nursery industry The industry should adopt new proven technology as soon as it is available. Not only is competition strong in our own country, competition from imports is a real possibility. Finally, we need to take the lead in adopting practices that help us live up to our projected image of an environmentally responsible Green Industry

LITERATURE CITED

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Tilt, K.M., R.L. Shumack, and **W.J. Foster,** 1990 Saving nursery irrigation runoff offers conservation and production advantages Highlights of Agricultural Research 37(1) 11