Tyler Hoskins of Robinson Nursery in McMinville, Oregon, displays air-root pruned oak seedlings grown with the AirTray Technologies. The plants are easily removed from trays, simplifying transplanting, Hoskins said. PHOTO BY MITCH LIES

# Eco-friendly pots

## Nurseries use new propagation systems with biodegradable liners

BY MITCH LIES

**Robinson Nursery** is generally pleased with its propagation system, but according to Tyler Hoskins, head of research and development, there is always room for improvement.

"There are some things that we're currently doing that we're not happy with, and there are some things that we're currently doing that we are happy with," he said. "But even in those cases, we believe we could still be doing better."

With that in mind, the Amity, Oregon, nursery is trialing two new propagation systems. The systems, one called AirTray Technologies that utilizes Ellepot liners, and one that includes use of Fertil liners in RediRoot trays, are designed to optimize production and improve plant development, and do so through use of eco-friendly pots.

The main incentive behind trialing the systems, Hoskins said, is to see if the nursery can build a better root structure in its seedlings and container plants.

"We are really interested in root quality and roots structure at every phase along the process," Hoskins said. "These systems stand potentially to give us a better root system that will be just better for our customers at the end of the day."

"We run trials like this all the time in pursuit of the perfect root system," Hoskins added, "and we get closer each time."

With one year under its belt, Hoskins said it is too early to say whether the nursery will switch to one or both of the systems. But, he said, early results are promising.

### AirTray Technologies

Both the AirTray and Fertil systems are built around the concept of keeping roots intact through use of biodegradable liners while exposing them to air pruning. The liners make transplanting easy and minimize root damage during the process. And the systems speed plant development.

The AirTray system, manufactured by Blackmore Company, includes the use of paper-based root liners made by an Ellepot machine that fit into propagation trays. The system also includes racks that elevate trays, which can keep roots from circling the bottom of pots and provide some disease-control by keeping plants off surfaces, some of which may contain bacteria, fungi or other media that can be problematic to plant health. Blackmore rents out the Ellepot machine and sells the paper used to make the liners.

Yongjian Chang, president of **North American Plants** in McMinnville, Oregon, said his nursery has been using the system for more than 20 years and today owns four Ellepot machines, including the original machine he purchased in 2002.

"It is still working today," he »

Customer Service and Shipping Manager Clayton Moore Jr. gives a tour of the Ellepot machines and explains how they work at North American Plants in McMinnville, Oregon. Rolls of biodegradable paper spool into the machine and the paper is shaped into a tube and the machine fills the tube with planting medium (above and below). Different papers are formulated to last different lengths of time, Moore said. PHOTOS BY VIC PANICHKUL

said, "and we've added three different models."

Chang said the strength of the AirTray system is the efficiency it brings to the transplanting process.

"It helps in the grading and the transplanting," Chang said.

Chang added that the AirTray Technologies racks, which he first purchased about ten years ago, further increased the benefits of the system by preventing roots from circling on the bottom of pots.

The AirTray system also has become a favorite for **Tree Connection**, a wholesale nursery in Dundee, Oregon, that sells potted trees from 12 to 15 nurseries to commercial fruit growers. In addition to facilitating transplanting, Loren Queen, sales manager for Tree Connection, said the company likes that the trays and racks can be reused, and that the paper-based liners disintegrate in the field after planting, eliminating any need to dispose of plastic pots.

And the system facilitates a quick turn-around, he said, much quicker than standard plastic potting systems.

"It's almost a just-in-time inventory situation," Queen said. "As long as the roots already exist, I can have a tree delivered to a customer in three or four months. And that can be a real advantage, especially when the industry is planting at full force."

One thing to consider when using the system, Queen said, is commercial fruit trees require more attention when brought to the field, at least for the first year.

"They take more work in the field," Queen said. "They take drip irrigation from the moment they are planted for the

next five to six weeks on a daily basis. And you've got to get the water on the plant, not near the plant. So, you've got to be very accurate with your drip tape. And then, of course, you've got to train that tree, so you've got to keep the stake on it, and you've got to have crews go out and make sure the wind doesn't blow them over. And you've got to keep the weed competition down.

"That first year is a very intensive investment of labor from the grower standpoint," Queen said.

### Fertil system

The Fertil system also air-prunes roots, but in this case uses a biodegradable wood fiber cup that fits inside RediRoot trays for its root liner. Like the AirTray liners, the cups hold the soil and roots in place, improving seedling quality and simplifying transplanting, according to Chris Murphey of RediRoot in Damascus, Oregon.

"The roots don't fall apart, the soil doesn't fall off, and they pop up much quicker and easier (when transplanting) if you have the cup than if you don't," Murphey said.

The biodegradable cups are made from spruce and fir trees that are culled from production forests in France at six inches of caliper. The wood product is then ground up then mixed with a slurry and steamed into a mold.

"There is no glue, there are no binders, there's no paper," Murphey said. "It's just wood fibers that are pressed into a mold and then quickly dried."

Also, Murphey said, the cups are manufactured in a way that takes advantage of the air-root pruning benefits of the RediRoot trays. "The pieces of wood are not square, they're not rounded. They're sort of sharp, with the idea that it creates a lot of air space, so the roots grow right through the product."

### Trialing both

Robinson is trialing both systems on several species, Hoskins said, including redbud trees, some oaks and

Magnolia cuttings grown with the Fertil insert in a RediRoot tray at Robinson Nursery. PHOTO BY TYLER HOSKINS

some hornbeams. Among promising early results, Hoskins noted that in the AirTray trial, the redbuds had better caliper at the end of a crop cycle than under the nursery's usual system.

"We were actually able to bud sooner in the field because those were larger, and the root structure was just beautiful coming out of those," Hoskins said. The oaks also showed improved development in the Airtray trial.

The nursery also noticed a quicker finishing time on its magnolia cuttings when using Fertil liners in the RediRoot trays. "We were able to finish them earlier than we usually do, so they are transplant-ready by this fall instead of next spring, which is when we usually pot them," Hoskins said. "So that could translate to a quicker finish time on that product as well."

The nursery hasn't tested whether plant quality holds up in their next stage of development, Hoskins said, which is part of the reason it hasn't adopted one or both of the systems. "I think it will, but we don't know that yet," he said.

Like Tree Connection, Hoskins said Robinson Nursery also likes the eco-friendly aspects of the systems, noting that the AirTray and RediRoot trays can be used again and again, and the container cups are biodegradable. "That's something that's been a value of ours for a while," Hoskins said.

For his dollar, Murphey said he believes the combination of RediRoot trays and Fertil liners is the most sustainable system on the market. "From our vantage point this is the most sustainable cup on the market, because there aren't any of the binders that are in some of the other paper cups," Murphey said. And, he said, RediRoot trays can be used 10 to 20 years before replacement.

"The combination of our products is very sustainable," Murphey said.

## Tradeoffs

There are tradeoffs to the systems, Hoskin said. For example, adopting the AirTray Technologies system involves the rental or purchase of an Ellepot machine to make the paper liners. In its trialing, Hoskins noted that the Blackmore Company loaned them a machine to test the system. If Robinson Nursery were to go forward, however, it would need to rent or purchase the equipment. There is also the expense of purchasing the paper used to make the liners.

"That would be a capital expenditure for us," he said. "And we would have to evaluate whether the improvements in crop quality are worth the costs involved in changing our system.

"I mean, we have seen some nice developments in product quality," he said of the AirTray system. "But whether it's worth that business decision at the end of the day, that's still unknown at this point."

The Fertil system, conversely, could be incorporated into the RediRoot trays that the nursery currently uses. "We would have some different tray sizes that we would have to buy for different items," he said. "But it would work pretty seamlessly with our current system here." Here again, however, there are additional costs in that the Fertil cups cost between five to ten cents per cup depending on the size, Murphey said.

The bottom line, Hoskins said, is the nursery has yet to decide whether to switch to one or both of the systems or stay with its existing system. "It's still early for us," he said. "We want to go through the whole cycle before making the decision."

But it is clear that one year into the trialing, the systems have the nursery's attention.

*Mitch Lies is a freelance writer covering agricultural issues based in Salem Oregon. He can be reached at* **mitchlies@comcast.net**.