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Small, sustainable containers

Research continues into green alternatives to plastic pots

Providers of greenhouse containers are moving beyond plastics to materials such as waste paper, coir, cornstarch, wheat, peat, wood fibers and more. Oregon's T&R Company distributes pots by Summit Plastics Company that are made of corn, wheat, wood or rice fibers, among other plastic alternatives.

By Miles McCoy

In the past, pots to grow and market plants were synonymous with plastic. Plastic pots may not have been the "greenest" product, but they were essential to nursery crop production.

No more.

The options open to growers have continued to rapidly expand, especially at the smaller sizes. Numerous constituent materials are being used and tested to create this range of biodegradable pots, including waste paper, peat, coir, cornstarch resins, wheat, bamboo, cow manure, feathers, and now sugarcane.

"I have seen, certainly in the last few years, a dramatic increase in interest and sales of these products," said Kym Pokorny, a garden writer for *The Oregonian* in Portland, Ore. She said she started seeing wide use several years ago, and noticed several new major manufacturers at this year's Farwest Show.

She said many of these pots are more than "sustainable" — they also offer convenience. "Gardeners have found many of them can be transplanted directly into the soil and forgotten," Pokorny said.

No transplant stress on young plants. No plastic pot to return.

Roberto G. Lopez is an assistant professor of horticulture at Purdue University. "The floriculture industry uses a lot of plastic," he said in a recent press release. "In recent years, (the industry) has come under pressure to become more sustainable and use bio-

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degradable or compostable pots."

But greener pots generally cost more to produce, he acknowledged. "There is concern about recouping the costs of becoming sustainable," Lopez said. "People say they are willing to spend 50 cents more for sustainable pots, so we wanted to see if they actually would."

So, Purdue did a study and found that the answer was yes — consumers will pay more for a sustainable product.

Earlier survey results indicated consumers would pay 69 cents more for rice hull pots while at the actual auctions they paid 58 cents more.

For straw pots, the survey 63 cents dropped to a much lower 37 cents. Wheat pots were nearly equal, with 24 cents in the survey translating into 23 cents more at auction.

"What this says is that if a grower is going to take the initiative to be a sustainable grower, they can increase their prices," said Lopez.

Grower response mixed

Consumers may pay more, but will growers? The answer is not as clear. Some not only question what containers are made from, but also how well they will stand up in a production system, and how well they break down after use.

The acceptance of green pots seems to depend more on the application. For example, production nurseries find the small, fiber containers to work well for transplanting.

Carlton Plants LLC, in Dayton, Ore., has used both Fertil and Jiffy pots for many years to improve transplant survival. "We get 2-3 percent better growth with certain plants grown in these pots," said Mike Anderson, who is the company's propagation manager. "Some plants, like hydrangeas, are stressed easily if they are bare-root planted, so these pots allow the roots to remain undisturbed."

Yet, others remain cautious about their use, especially if they have to be shipped. "We don't use them yet, mainly over concerns about how long they will last," said Laura O'Leary, the former sustainability director for Northwoods Nursery, a green-minded grower located in Mollala, Ore.

Longevity concerns go back to the early Jiffy products, which have found numerous uses in nursery propagation, and are now a standard tool

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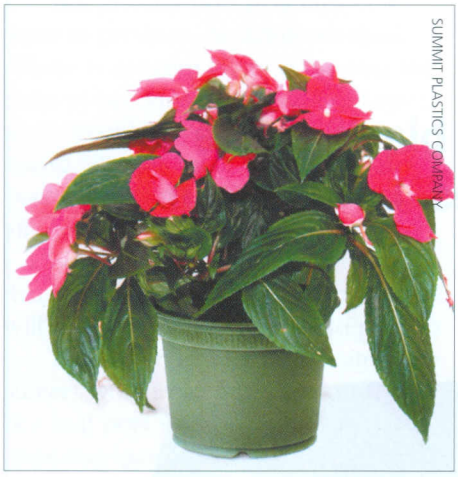

JanorPots, made by Summit Plastic Company and distributed in Oregon by T&R Company, are biodegradeable.

for growing plants. However, many deemed the pots too fragile for field and shipping uses.

The numerous new options may also be confounding growers. Anderson Die & Mfg. Co. Inc Portland, Ore., said their new line of recycled containers still has not caught on, though some growers have taken samples to test.

Wide range of substrates now available

Jiffy Pots, an early name in nursery containers, were introduced in the mid-1950s. In Oregon, Western Pulp Products has more than a 50-year history of making containers using waste paper. Their products are not considered "organic," but they are used to grow organic plants, sales manager Jim Lee said.

Oregon Tilth certified that organic vegetable transplants could be grown in their molded fiber containers but the plant must be removed from the container before planting.

While many newer biodegradable containers are manufactured by processes similar to the Western Pulp method (a plant-based material held together with a binding agent), many others alternative pots are now available in the market. Meanwhile, several research projects are taking unique approaches. There are pot alternatives on the market today that are made with the following materials, for starters:

- **Wood.** Fertil biodegradable plant pots are made from a blend of 80 percent natural, biodegradable wood fibers, plus 20 percent peat moss. Meanwhile, Summit Plastics Company has a biode-

gradable line, "Eco 360," that features containers made of corn, wheat and wood fibers.

• **Wheat.** Another company, T & R of Woodburn, Ore., is offering a new line of containers called Ecotainable®. Manufactured by Kelmar's Creations, the products use patented bioresin materials, made from wheat, tapioca, potato starches and corn, to form pots and other products.

• **Coir/coconut fiber.** CoCo Coir Pot, made by Green Neem, is a biodegradable cultivation pot made of coconut fibers, which have exceptionally high permeability to water, air and roots. Coir products are now available from several years and available through several manufacturers.

• **Chicken feathers.** This pot is in the last test stages, supported by the American Nursery and Landscape Association (ANLA) with the focus of finding compounds and resins that will stand up to normal environmental pressures, especially in the South.

"We need materials that will stand up to the south's warmer temperatures, heavy irrigation schedules, and high levels of nitrogen," explained Agricultural Research Service horticulturist Donna Fare. She said these environmental factors work together to break down non-plastic pots in the field.

• **Manure.** CowPots uses "odor-free, 100 percent composted cow manure" as the substrate. They claim the manure also adds more nutrition when the plant is growing or transplanted. Their seed starter pots, made from composted cow manure fibers, recently added three new sizes (3, 7 and 12 inches) for commercial growers. The new 3-inch round, 7-inch square and 12-inch square pots are a result of customer requests. They are manufactured to hold up in a commercial nursery for over 12 weeks.

• **Plant starches.** Jiffy remains a major producer and recently released a new pot, CarbonLite, they claim is

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SUMMIT PLASTICS COMPANY

These NetPots are made from rice hulls rather than plastics and have a much lesser impact on the environment.

"automation ready." It uses a bio-based manufacturing technology using primarily plant starches to build the pot. According to the company, the pots will take four-color printing and will work in automated production systems. Growers can customize the pots with their own designs.

Research expands substrate options

All this interest is driving radically different approaches being researched by several companies.

EcoCradle products made from agricultural byproducts including cottonseed hulls, buckwheat hulls and rice husks. They are mixed with a filamentous fungus, a mycelium that acts as a bonding agent and grown inside molds. The mycelium secretes an enzyme that decomposes the organic waste as it grows.

After seven days at room temperature in the dark, a compact, ultra light, malleable material is formed that can resist high temperatures, according to company literature.

Meanwhile, petrochemical company Braskem and enzyme producer Novozymes have launched a five-year research project to develop large-scale production of greener, cheaper polypropylene (PP) from sugarcane.

Using fermentation and engineered microorganisms to create a "plastic" for pots. The company's news releases claim PP from sugarcane is a cheaper alternative than plastics.

"We live in a world where oil is limited and expensive, and the chemical industry is looking for alternatives to its petroleum-based products. Novozymes' partnership with Braskem is a move toward a green, bio-based economy, in which sugar will be the new oil," Novozymes CEO Steen Riisgaard said in a press release.

The downsides

The plastic-alternative pots come with some issues.

First, growers need sturdier containers, especially for plants that reach garden centers.

Second, while it is recognized that some pots need perfect conditions to decompose, some manufacturers have cautioned consumers that other pots need to be handled correctly when planting to avoid problems.

There are several issues involving pot "recycling."

First, some of these containers do not end up in nursery compost piles, but in the current plastics recycling stream. This causes problems, since the machines are not designed for non-plastic materials.

Additionally, some processors are noticing that some of the alternative pots are reacting with the composting microbiology and actually increasing temperatures.

This may be handled within the systems with more experience, while some owners are looking at anaerobic composting to break down these pots.

Not going away

In conclusion, one has to only look at all this activity to see it is a long-term trend in the nursery industry.

Plastic alternatives help solve the problem of waste. Not only does this trend reduce material from the waste stream, but it also has worth. It also creates new products, new businesses, more sales and jobs. It is an excellent example of "closing the loop" and creating true sustainability within the nursery industry.

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Cover: *Hosta* 'Loyalist' is a form of the variegated *H.* 'Patriot', which was Hosta of the Year in 1997. But instead of being white-margined like 'Patriot', it is white at the center. Many gardeners have a strong passion for all the hosta selections that are available. See our article on Page 27. Photo courtesy of Blooming Nursery.
This page: An amber snail (*Oxyloma sp.*) appears to admire its reflection in the side of a plastic container at the North Willamette Research and Extension Center. Researchers there are exploring new ways of managing the tiny pests. Photo by Curt Kipp.

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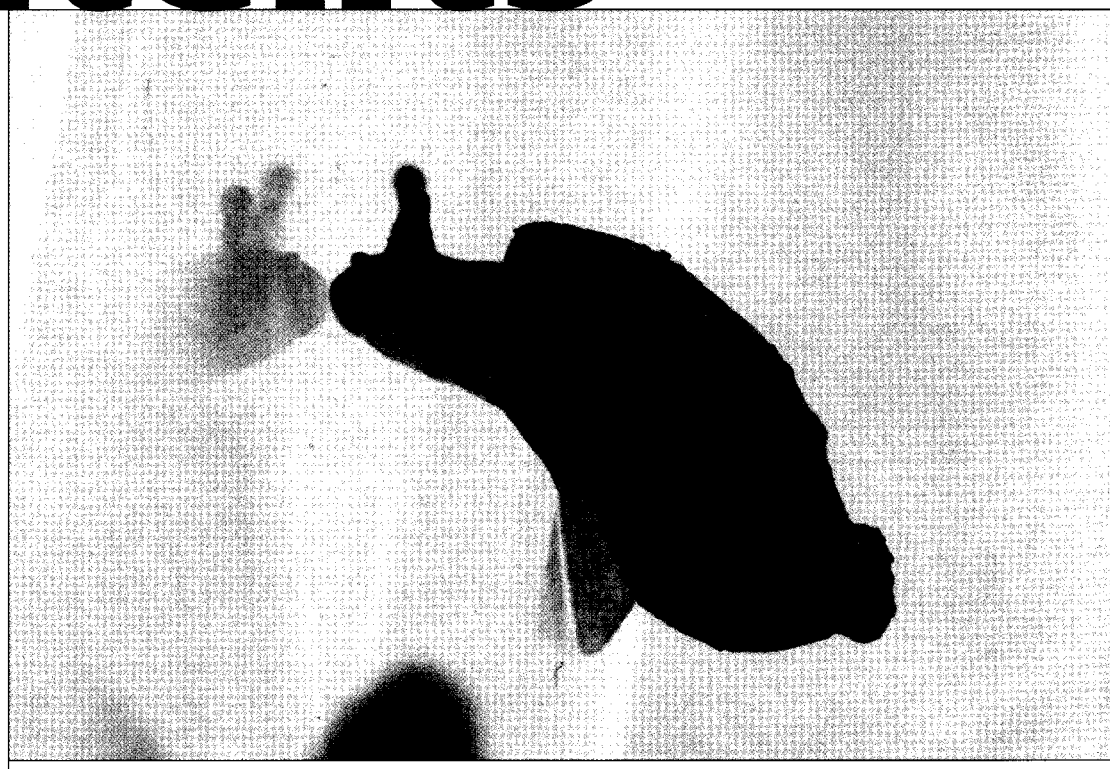

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