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**157. Nurseries turn their waste materials into rich soil free of weeds and pathogens.**

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# Committed to compost

## NURSERIES TURN THEIR WASTE MATERIALS INTO RICH SOIL, FREE OF WEEDS AND PATHOGENS

By Elizabeth Petersen

"Most organic waste materials generated by a nursery or landscaping service can be composted," according to DEQ's "Nursery Composting Best Practices" publication.

This comes as no surprise to production nurseries in Oregon, some of which have already developed effective on-site composting operations.

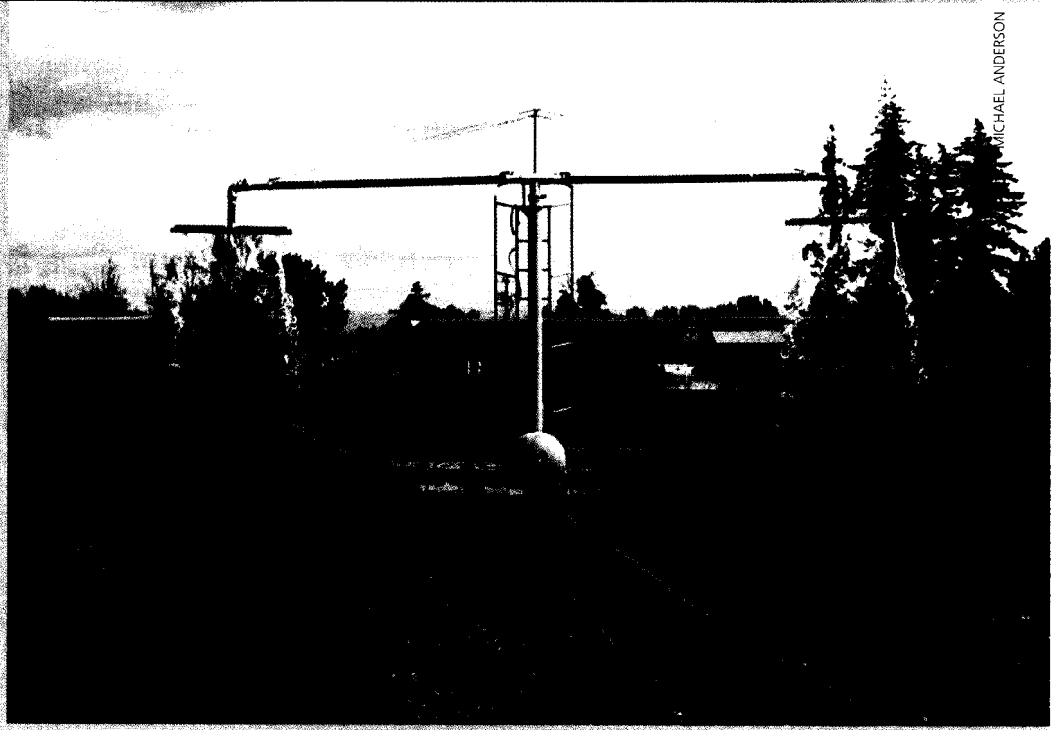
Nurseries generate tons of green waste annually, and composting operations keep these massive quantities of green waste out of landfills, but the benefit to nurseries is even greater. They are creating soil amendments — rich in nutrients, humus and microorganisms — that augment their own potting mixes and enhance the condition of their fields.

"We have seen dramatic results," said Allan Elliott, operations manager for Carlton Plants in Dayton, Ore., a wholesale grower of bare root deciduous shade, fruit and flowering trees and shrubs. Site-made compost applied to a field that had not been producing strongly implemented an impressive change.

"It was like a new field," Elliott said. "The plants thrived."

You might say, "Decomposition happens," but composting in big-scale operations is about managing the natural process to encourage healthy communities of microorganisms that effectively break down organic material.

Given adequate water, air and time, naturally occurring, beneficial microorganisms feed on the green and brown materials, consuming oxygen and creating heat. Prolonged composting activity produces enough heat to kill weed seeds and pathogens and produce clean, productive material.



MICHAEL ANDERSON



MICHAEL ANDERSON

Carlton Plants of Dayton, Ore., uses the windrow method of composting. As unused organic materials such as clippings, trimmings and culled plant matter slowly turn to compost, the rows must be watered (top) and turned (bottom) repeatedly.

### On the straight and narrow

Carlton Plants committed to a large-scale, on-site composting operation about 15 years ago, and during the last five years has honed the program.

Although nurseries use a variety of types of compost piles, Carlton Plants utilizes the windrow type. For it, organic plant materials are ground and mixed with feedstock (usually horse or steer manure) in long, straight piles. The piles are moistened and turned repeatedly over the course of several months.

Materials that are diseased and "highly susceptible species" are sepa-

rated and burned. Otherwise, all manner of green and woody materials, including trimmings, culled or graded-out plants, lawn clippings and leftover plants go in.

"We don't discount our plants, so at the end of the year, material that has not sold goes into the pile," Elliott said. "We clean out the coolers in June and grind in July. We strive for a 3-to-1 ratio of carbon to nitrogen by volume."

Then the composting begins. Since the process of active decomposition depends to a large extent on good

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aeration, adequate moisture and high temperatures in the piles, these factors are monitored and modified as necessary to maintain optimum conditions. The heat in piles at Carlton Plants ranges from about 120-145 degrees F, temperatures that are hot enough to kill pathogens and weed seeds.

The resulting compost is analyzed for nutritional value and biological makeup, so the nursery knows exactly what it has.

Costs associated with the composting operation at Carlton Plants include feedstock; grinding, hauling and spreading services; operators' time; supervisory time and analyses. The nursery invested in a Frontier 12' PTO driven compost turner, manufactured by GK Machine in Donald, Ore., to assure consistency and uniformity in its piles.

Elliott estimates the cost to produce

and spread the compost to be about \$9 per cubic yard, compared with commercially produced compost that sells for about \$18 per cubic yard. Despite these costs, "the value and repayment is high," Elliott said, "because it enhances the sustainability of our fields, reduces disposal costs, reduces greenhouse gases by eliminating burning and obtains positive feedback from the community."

Carlton Plants uses the compost in a variety of ways, including as a top-dress over seedbeds in place of fir sawdust, to side-dress scion orchards and in the landscape.

### Breathing life into throwaways

In 2001, the Northwest regional office of the Environmental Protection Agency (EPA) awarded Monrovia Nursery its prestigious Evergreen Award for environmental excellence and lead-

ership in pollution prevention. The large-scale Oregon grower uses on-site composting as part of its sustainable practices at the Dayton, Ore. site.

The EPA award recognized the composting operation for helping eliminate the use of pesticides to kill weeds, diseases and insects in the nursery's green waste. Monrovia uses a different type of compost pile, the aerated static pile, according to Monrovia Technical Services Manager Walter Suttle.

"There is a real art to making compost and keeping it alive," he said.

The process of composting relies on living organisms, Suttle said. He draws a distinction between the work of beneficial organisms in an active compost pile and the passive conditions of mulch. For good, lively compost, he said, aeration is extremely important.

The process at Monrovia utilizes

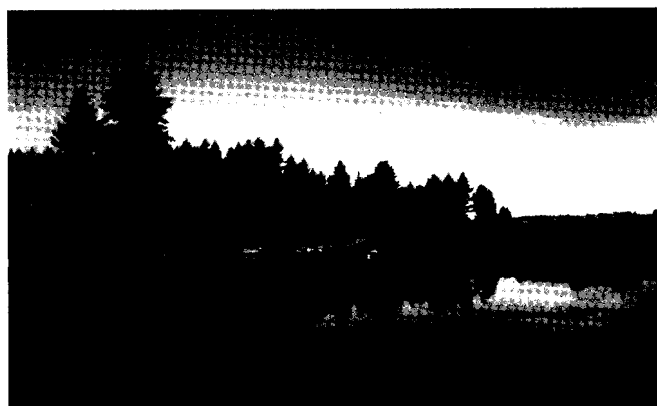
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industrial fans that push air directly into piles through a series of pipes. The piles are not turned, but the air movement provides beneficial organisms with the conditions they need to thrive, and as temperatures in the piles increase, destructive organisms are killed, and as the pile cools, a community of beneficial organisms replaces them.

Suttle said his worry about committing to the compost operation was "about making sure that every single part of the compost pile was heated adequately" to kill pathogens, insects and weed seeds.

"Thermophilic (heat-loving) organisms inhibit bad organisms and allow the good ones to grow," he said.

Suttle credits staff research craftsman Victor Sahakian with developing the method now in use, in which temperature probes monitor conditions to assure that the entire pile is heated.

"At first, we had temperature probes everywhere in the piles, but as we gained confidence, we were able to use only three or four probes per pile," he said. Monrovia's compost piles reach about 160 F, according to Suttle, although he added that 140 F for four weeks is enough.

The nursery builds 10 to 15 compost piles every year now, each pile made up of about 1,000 cubic yards of organic material, all of it generated on site. Plants that do not meet Monrovia's high standards, instead of ending up in landfills, go into the compost piles, as do all sorts of other prunings, clippings and green waste.

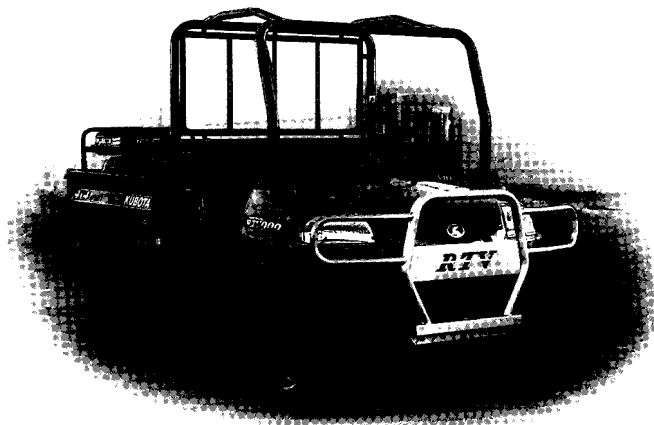
The resulting high-quality compost is used as a component in most of the custom media mixes Monrovia makes, as much as 25 percent in some of the mixes, Suttle said. Besides the obvious benefit of keeping the material on site, Suttle attributed an important direct benefit to use of the compost: it has produced a reduction in root diseases.

"Studies have shown that our compost is among the best at suppressing certain root diseases," he said.

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Eliminating the use of methyl bromide has been another significant benefit in Monrovia's efforts to attain the degree of sustainability recognized by the EPA.

### Let nature take its course

Bailey Nurseries runs a 1,300-acre facility in Yamhill, Ore., where it produces an array of plants, from seedlings and rooted cuttings to finished bare root and container-grown stock, including deciduous trees and shrubs, evergreens, fruits, perennials, annuals and roses.

For about 10 years, all trimmings, gradings and container culls have been composted on site, except those included on the SOD host list, according to Yamhill Production Manager Mike Lee. The Bailey Nursery operation is neither a windrow type nor an aerated pile type, but its own version which Lee calls a "row-shaped heap."

The relatively casual approach relies on the natural forces at work when green materials are heaped up, turned occasionally and left to compost over time. Even without a special turning machine or a series of air pipes, without temperature probes or careful monitoring, Bailey Nursery produces compost that it uses either to replenish the soil in its fields or as a component in the company's general container-potting mix.

Several times a year, Lee said, the company hires a grinder to chop the accumulated plant material into small pieces. A loader with a bucket pushes the material into a heap, and then turns and stirs it about once a month. After two years, the compost is analyzed and, depending on its quality and degree of decomposition, is used to amend fields or to increase the water-holding capacity of the potting media.

According to Lee, the compost has allowed the nursery to reduce the quantity of peat moss it brings in from Canada, another specific benefit that this natural practice offers to improve sustainability.

It is clear that interest in composting is very high among growers in Oregon. In fact, recently, Allan Elliott of Carlton Plants presented a lecture on the topic to a meeting of International Plant Propagators, and he says that in his experience over the last 30 years, no topic has generated as much response.

"It struck a nerve with a lot of people," he said. ☺

*Elizabeth Petersen writes for gardeners and garden businesses, coaches students and writers, and chairs Oregon Plant a Row for the Hungry. She can be reached at gardenwrite@comcast.net.*

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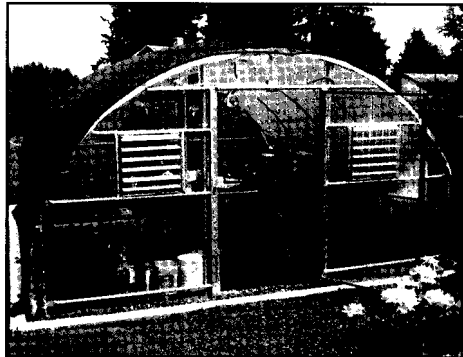
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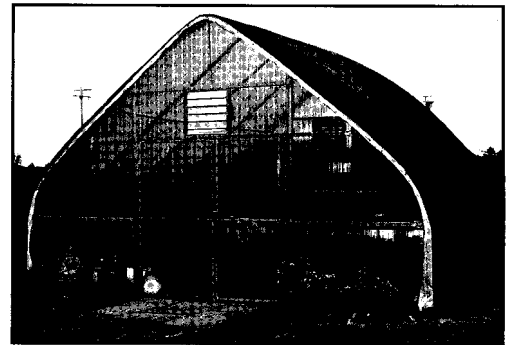
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