


This article was listed in Forest Nursery Notes, Summer 2007

**43. Recycling and reuse: what to do with all that plastic?** Miller, T. I. Digger  
51(5):41-47. 2007.



Separation of plastics by resin type (number) but not necessarily color (unless clear) is the way to store and transport plastics for recycling.

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# Recycling and Reuse:

## What to do with all that plastic?

*By Tracy Ilene Miller*

In 1991, Oregon passed a rigid plastic containers law to address — on some level — plastics recycling, which at the time had yet to be included in any recycling legislation. Historically, the amount of plastics in the U.S. municipal waste stream was less than 1 percent in 1960. But by the early 1990s, the amount had increased to nearly 9 percent of the waste stream, with the largest category of plastics represented by rigid types.

What are those? Rigid plastics can be identified by their ability to stand up on their own, such as soda bottles and are what we know as #1 containers. Nurseries use rigid plastics in a variety of ways, with three types, or resins, making up most of the products: high-density polyethylene (HDPE #2), polypropylene (PP #5) and polystyrene (PS #6). Plastic film used for greenhouse covers is low-density polyethylene (LDPE #4), which is not included in the law.

The 1991 law, which appeared in other states as well, set some requirements for compliance by rigid plastics manufacturers or manufacturers who generated



Above: Agri-Plas and other recyclers prefer to receive pots sorted by resin type in order to reduce labor costs.

Right: It's not necessary to sanitize pots prior to recycling, and a little dirt is expected and acceptable with nursery containers, but recyclers may reject a load that's deemed too dirty.



products in those kinds of containers. In the past few years, they have been in compliance. Compliance is defined in one of three ways: The container must contain 25 percent post-consumer recycled content; must be reused or refilled at least five times; or must be made of a plastic that is being recycled at a rate or 25 percent or greater — or all rigid plastics, in aggregate, must be recycled at 25 percent or better. The last requirement is the one that has mostly allowed companies to be in compliance.

In aggregate, plastics recycling, with some recycled at 35 percent and others at 15 percent, for example, was being done at 25 percent or better. But last year the Oregon Department of Environmental Quality announced the state level had, for the first time in years, dipped below the requirement, which meant that companies would be barred from using the aggregate to be considered in compliance and must instead use one of the other criteria.

But, by law, the agency can't impose any penalties for a year after announcing the new levels.

How does this affect nurseries?

"As it stands now, as of 2008, the nurseries will have to know what they use, the type of plastics, and they couldn't use plastics that are recycled lower than 25 percent," says Peter Spendelow, the department's solid waste specialist.

An example used by Spendelow is polystyrene. On its own, it's not recycled above 25 percent and so could not be used unless products were reused or refilled at least five times or contained 25 percent post-consumer recycled content. In that way, nurseries may not be as badly hit as other industries because most reuse their containers.

On an individual basis, then, companies could adequately show that reuse and be exempt. In addition, there is a petition process for documenting how a whole industry as users is recycling to the point of compliance.

"There's a possibility that a company could show that even though polystyrene isn't recycled overall, an industry may be recycling this class of material as a whole, which would qualify it as well," Spendelow says.

But it does remain to be seen whether the agency will get to the point of enforcing the law. Manufacturers stepped up almost immediately to protest last year's announcement. Eleven business associations filed a petition in January to amend the definition of "recycled" to include anything that is intended (picked up) for recycling, even if it does not end up processed as such. Among other reasons, the primary argument from the petitioners is: They say they should not be penalized by what they identify as inefficiencies at materials recovery facilities that prevent the proper handling and recycling of those plastics.

Another way the department is looking at the problem is by assessing whether HDPE juice and water bottles, which have exploded on the market and are only recycled at 30 percent — while deposit bottles are recycled at 70 percent — should be assessed a deposit.

And then there's another reason things could change quickly: The market for plastics and the cost of recycled plastics has increased because of rising oil prices. As a result, some in government and the industry are moving toward a simple solution: try and improve the rate of recycling back to more than 25 percent. And that's where the nursery business is a leader.

"The nursery industry has been doing a good job," Spendelow says. "Agri-Plas and Weyerhaeuser have been accepting trays, pots and film, and Agri-Plas started with bailing twine. Those activities are pushing up recycling rates substantially."

Agri-Plan expanded its facility in Brooks, Ore., last fall, adding another 30,000 square feet with financial



HDPE (#2) is a high-value recyclable plastic with strong markets and easy transport after it's shredded.



COURTESY OF AGRIPLAS INC.

Recycling at nurseries has been a grass-roots movement; even so, Agri-Plas was at capacity almost as soon as it expanded.

support from several agencies, including a \$100,000 grant from the Governor's Strategic Reserve Fund. And without soliciting any new business, the facility is already at capacity, with 1.5 million pounds of plastics onsite.

"We see more and more nurseries wanting to do recycling," said Allen Jongsma, vice president and plant manager. "People are concerned, and they're wanting to recycle. We try to promote that, and we don't turn anyone away."

Both Agri-Plas and Weyerhaeuser Co., with a location in Eugene, have been working with nurseries to either pick up or take drop-offs of nursery plastics. Weyerhaeuser has been a longtime leader in recycling of paper and cardboard, and for more than a decade the company has slowly built up the kinds of plastics it has recycled, receiving recognition first for its shopping bag recycling, (which, among other things, it has used in its plastic lumber product, ChoiceDek).

Weyerhaeuser now accepts virtually all types of plastics. And the only one Agri-Plan does not accept is polyvinyl chloride (PVC #3), the kind that goes into making plastic pipe.

While Agri-Plas never pays for plastics, Weyerhaeuser does, but nurseries should not expect to make money from plastics recycling, considering that plastics are lightweight and bought by weight. It can amount to virtually nothing per load.

Instead, the payback comes mostly from saving on the tipping fees to landfills and the notion of saving useable material from being wasted. Both companies will arrange to pick up plastics when the quantities warrant it.

Quantity highlights one of the difficulties of plastics recycling for nurseries

and other industries as well: The market demand for recycled plastic resin is growing, but transportation costs of collecting the material — for both the end-user and the handler — and getting it to the recycling plants economically have always been a hindrance.

Because there is so much material available, handlers don't need to expend huge amounts of time and money to get enough plastics to keep working at capacity. And nurseries not within a short driving distance from the Agri-Plas or Weyerhaeuser sites find it's also not cost-effective to drop off many small loads when tipping fees at rural landfills are relatively inexpensive. Sometimes drop boxes can be left to help a nursery set the plastics aside immediately — as when film is being removed from a greenhouse — and then it will be hauled and processed later. Nurseries that call ahead may get a visit to determine the costs of transportation and the value of the material.

"There are some grades of material in quantity that I do pay for and can pay," says Lorena Young, recycling account manager for Weyerhaeuser. That includes pots and trays and greenhouse film. "I routinely buy mixed film, which would include bags, I also buy polypropylene woven bags," she says.

Another problem in the nursery industry is cleanliness. Handlers will accept plastics with some dirt — that's a given. But when there is too much dirt, it's considered contamination.

"I'm not looking to buy or take dirt clods," Young says. "If the dirt's dry, it should be knocked off. Some remnants are okay; I'm not saying they have to be washed. But if they are bad, they should go in the garbage."

But because some dirt residue is acceptable, overall recycling for nurseries is not a capital-intensive project, Young says.

For smaller nurseries, reuse still constitutes a savings and can make it worth the effort — even to the level of sometimes grassroots collection. Three Brothers Nursery LLC in Canby, for instance, instituted an intensive reuse program since it opened 11 years ago. Originally, the nursery picked up pots from individuals and retail centers. Now it concentrates on customer returns and pickups from retail centers and landscapers.

"Landscapers and garden centers are a real good source," says co-owner Everett Pearson. "Landscapers won't reuse them, and retail centers have bins and they can't use all that comes back. They are happy to see us."

Pearson can then pick through the pots and choose the ones he wants to take back. He selects the sturdier injection-molded pots over the more flimsy blow-molded pots.

"In the heat, they crumble," Pearson says. "We also don't pick up any funny colors because the customers reject them. We basically like to stay with blacks and greens."

One reason retail centers may be happy to see Pearson and his truck is that he pays anywhere from 2 to 9 cents for the larger pots. The nursery no longer has to pay for the smaller pots because they are so plentiful.

Customers have learned to clear out their garages and bring back the inch-size pots to the nursery or to the farmers' markets where Three Brothers sells.

As a result, "some pots we don't have to buy used anymore," Pearson says. "Once in a great while we have to buy a specialty pot, but for annuals we usually get enough to do our planting."

The pots are run through a sanitizer and cleaned up for reuse.

Besides the state's response to lower recycling levels, nurseries may be forced in the future to look at recycling less on a voluntary basis. The federal government, for instance, is exploring laws for pesticide container recycling. And as plastics use increases worldwide by nearly 3 percent each year, government is interested in diverting

more of it from landfills, especially as markets (in particular, overseas and in China) get stronger for buying reprocessed plastics.

The price of oil and natural gas — central to the manufacturing of virgin resins — has a direct impact on the plastics industry. The hurricanes of 2005 forced increases. When prices of crude tumbled after a high last July, so did the price of plastic resins. When oil prices are temporarily high, companies sometimes absorb the costs for short periods of time.

But over time, if oil prices stay high, the value of recycled stock goes up and the prices of virgin plastic go up as well, affecting the economy because they pass the price on to consumers, i.e., nurseries. The market of plastics therefore has its own ecosystem that nurseries participate in.

At this point, however, outside of encouragement to reuse, nurseries are urged to call Agri-Plas or Weyerhaeuser to consult about a pickup for not only rigid plastics but also twine, bags and film. A phone call can often return positive results, and a visit can frequently reveal surprising results.

Young recalls a visit she made to a nursery last month.

"He had a list of eight things to recycle, but he had much more than he thought," she says. "It starts with a question, and we're always happy to answer questions."

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*Tracy Ilene Miller is a freelance writer and adjunct faculty at the University of Oregon's School of Journalism and Communication and Northwest Christian College. She can be reached at [tmillerwriter@yahoo.com](mailto:tmillerwriter@yahoo.com).*