

From Forest Nursery Notes, Winter 2013

267. Steam treating for weed control. Rideout, W. American Nurseryman 210(4):12-14. 2012.

Steam Treating for Weed Control

No one likes weeding. It's a back killer, and for nursery owners it's a huge outlay of time and money.

Heritage Seedlings, Inc. took progressive steps to nip weeds in the proverbial bud by steam cleaning and reusing both plastic containers and soil. In doing so, the company reduced its carbon footprint and saved money from two elements of the cost of goods sold: production materials and general labor.

Heritage Seedlings Inc. has managed its weed problem using low-tech solutions that save money, labor and Mother Earth.

By Whitney Rideout



Thanks to Heritage Seedlings' steam program, weed-free propagation trays fill the greenhouses. The company employs steam to clean both containers and potting media.

Heritage tackles the problem

Heritage is a wholesale propagator of unique deciduous woody plants and Willamette Valley natives and perennials. The company's main office is located in Salem, Ore.; field operations and new greenhouses are in Stayton, Ore. Heritage operates seven acres of greenhouses, 15 acres of cold frames and 240 acres of field-grown liner production. The company has reused its containers for years, but the decision to begin steam-treating containers and planting media came from its participation in the Oregon Department of Agriculture "GAIP," or Grower Assisted Inspection Program.

"Weeding takes a tremendous amount of resources that could otherwise be used to propagate or fill orders," says manager Eric Hammond. "We were able to deal with the critical control points surrounding disease and container re-use, but we couldn't justify the huge labor bill for weeding. I clearly remember the 'profit-driven' pressure to produce clean liners crashing into the 'real world' fact that we had rings of weed seedlings around the container sides before the tree seedlings had emerged.

"It was just ... an impossible situation," he continued. "Ethically, we felt really good about our decision to re-use our containers in a 'reduce, recycle, re-use' sense, but in doing that, we compounded the weed problem year after year. We needed a solution that could help us maintain our high level of product quality, save a realistic amount of money, and continue to stay comfortable from a 'we're doing the right thing here' standpoint—in other words, sustainability."



Small, thin-walled trays are cleaned in this cooker for 10 minutes at 170 degrees.

'The return on investment for the big steamer was less than one year; weeding labor is an enormous outlay, so it doesn't take long to pay for something that helps you reduce it.'

Photo courtesy of Heritage Seedlings Inc.



A refrigerated truck with attached steamer is used to clean large, thick-walled plastic baskets and bulb crates.

Container cleaning

The solution Heritage implemented was to hot-water bathe its small, thin-walled plastic containers and steam treat large, thick-walled plastic containers and recycled potting soil.

Two different stations were developed for this function; one each for the two types of pots. The small, thin-walled containers are treated in a hot water bath cooker that owner Mark Krautmann bought at auction. With a capacity of 1,000 gallons, the cooker takes a full day to heat up, but once it's heated it can clean a half pallet of trays at a time. "Ten minutes at 170 degrees—it works like a dream," claims Hammond. "We run the cooker for only about a week to clean everything, and then we shut it down and give it a rest until we have the need for fresh trays. It's a wonderful solution to a very difficult problem, and it's relatively efficient from a labor perspective.



A trailer and steam generator system are used to clean soil at Heritage Seedlings Inc.

'Recycled containers and soil steam treatments have been a big win for us, clearly, but more than that, they've led us to think more progressively about what else we might need to change.'



"While the cooker cleans the trays," he adds, "employees can tend to other tasks."

The cooker is ideal for the small trays, but Heritage found it too labor intensive for thick-walled plastic baskets and bulb crates. "Actually, it was simply obvious there were better options for the thick-walled containers," Hammond says. "We converted an old refrigerated truck into a steamer to handle the large baskets. [It's the] same principle as the tray cooker, just bigger. The capital outlay was about \$8,500 for the steamer, cement foundation and used refrigerated truck. The return on investment for the big steamer was less than one year; weeding labor is an enormous outlay, so it doesn't take long to pay for something that helps you reduce it.

"Also, weeding isn't exactly the most rewarding work and so our employees spend more time doing the things they enjoy and taking pride in seeing the trees they planted come up. Bottom line, we're spending more time growing the plants we want to grow and less time battling the plants [weeds] we don't want to grow, so it's just all-around good for Heritage and its people."

Soil cleaning

Used media adds up: "We'd been generating a mountain of used potting soil that we wanted to re-use," Hammond states. "But we knew there was a horrible weed-seed bank in it. When we enrolled in the GAIP with ODA, we were required to clean the soil to reuse it, and [we figured] 'Well, okay; in for a penny, in for a pound. Let's figure out how to get this done.' So we did, and again, the results have been very positive for us."

Heritage runs steam through pipes at the bottom of a large trailer. The return on this investment was a mere five months:

- The variable cost [fuel + labor] to steam the soil: \$15/cubic yard
- Delivered cost of new soil mix: \$43/yard
- Capital outlay for the steam generator and materials: \$20,000
- After only 700 yards of soil use, the capital outlay was re-deemed and now Heritage saves approximately \$28/cubic yard for reused, clean soil

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Steam Treating *for Weed Control*

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T38-081-001 (03/12) BR 010-60782 DATOTURF1075



Located in Stayton, Ore. (with a main office in Salem), Heritage Seedlings Inc. specializes in propagating unique, deciduous woody plants as well as perennials and Willamette Valley natives.

Results go beyond time and money

When asked if employee buy-in was difficult, Hammond responded, "Not at all. Employee buy-in for all three activities was very quick. This solution has a very high 'hey, we're doing the right thing here' common-sense appeal, and at the same time it allows people to spend more hours of their day doing more rewarding work.

"So," he continues, "we saw a very quick return on investment, but more importantly, we are all more satisfied that we're not contributing to waste and pollution, and that we have more time to spend on valuable tasks like transplanting and staking."

The systems used at Heritage didn't develop overnight, and there were both trials and errors in fine-tuning the cleaning solutions to meet the company's needs. Hammond recommends not getting hung-up on copying them—or anyone else—exactly, but rather focusing on the desired end-result and working backward and forward through the operations flow to identify the sources of problems before attempting to solve them.

"Once you really understand the root of your problems and where they impact your people and your costs," he explains, "you'll be headed down the right path. Recycled containers and soil steam treatments have been a big win for us, clearly, but more than that, they've led us to think more progressively about what else we might need to change. It demonstrated to our crews the positive effect of solving the problem at the beginning. Our team is incredible, and I'm very proud of them. At this point, I don't think there's anything we couldn't do if we put our minds to it."

A version of this article previously appeared in The Digger, the publication of the Oregon Association of Nurseries.

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