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Hotter than ever

Peoria Gardens' Tom Verhoeven converted a wooden storage area into a simple steam room (top) where carts loaded with flats are treated using a steam generator (shown: Siebring Manufacturing Model SG-10).

STEAM CLEANING MAY BE THE BEST WAY TO PREVENT DISEASE TRANSMISSION IN USED POTS, FLATS AND CONTAINERS

By Chris Guntermann

Nursery practices are changing. New pathogen challenges are prompting growers to revive old remedies, including methods of sanitation.

Used pots and flats are a known disease vector for many pathogens, including *Phytophthora ramorum*. Such diseases can carry over from year to year and infect new plants at the propagation stage, often without showing symptoms. Then the disease can be spread as plants are lined out.

For years, nurseries have relied on chemicals to sterilize and sanitize containers. However, concerns over efficacy, worker safety, and ease of use have prompted a renewed interest in pasteurizing with steam.

Historically, steam has been used for soil preparation to raise temperatures so as to kill most pathogens, but leave most beneficial microorganisms. Using steam on pots and flats is easy, and usually requires less precleaning, and generates very little waste water. Most nursery plastic pots and flats can withstand the recommended steaming time and temperatures of 140 to 160 degrees F without sustaining any damage.

Local nurseries have reported improved plant quality and uniformity after switching to a steam sanitation

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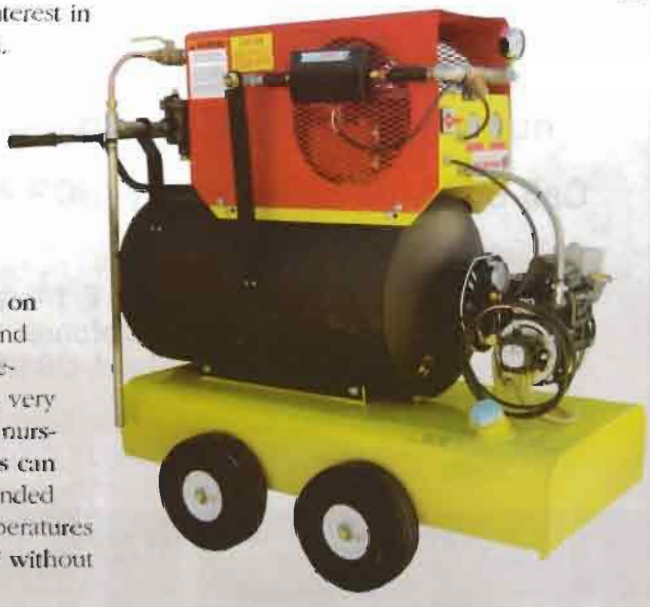

program. Peoria Gardens noted significantly fewer disease problems after treating all reused plug flats. The cost of steam treatment was offset by being able to reuse rather than purchase new flats for critical crops.

Several forest tree nurseries are using steam. Weyerhaeuser's seedling farm in Rochester, Wash., uses a process in which up to 10 pallets of washed styroblocks are placed into their steam chamber, Jim Brickman said. It takes about one hour to raise the temperature to 175 degrees F. The temperature is maintained for 30 minutes. Cooled trays are then fed directly into the planting line.

IFA Nursery's seedling farm in Klamath Falls, Ore., recently built a steam chamber and purchased a Siebring steamer to treat its styroblocks at a temperature of 165 degrees F for 30 minutes. Poly pots can be treated at up to 175 degrees F.

"The key to a chamber design is a room free from drafts and made from waterproof and heat-resistant materials," IFA's Mark Thompson said. "Insulation must also be waterproof. An old (refrigerated) van would be ideal. We have had our blocks lab tested and they are free from pathogens."

Jeff Dieringer of Dieringer Nursery in Hubbard, Ore., uses a converted Landa steam cleaner to generate steam for his simple plywood chamber. Pots and flats are not washed before being stacked on pallets and treated for four hours at 193 degrees. Pathogens are eliminated without damaging plastic.

Neal Lucht at Pacific Water Gardens in Molalla, Ore., uses his Siebring SG-10 steam generator for pasteurizing potting soil and will soon be offering a "steam-for-hire" service.

According to Gordon Siebring, owner of Siebring Manufacturing in George, Iowa, there is a difference between pressurized boilers and steam generators. Steam generators offer simplicity and lower cost. Generally, they do not require pressure vessel permits.

Melissa Lujan of the Oregon Department of Agriculture is the auditor for the state's Grower Assisted Inspection Program (GAIP), which offers training and recommendations for monitoring and reducing *Phytophthora* transmission. For more information about GAIP and its benefits, browse www.oregon.gov/ODA/PLANT/NURSERY/gaip.shtml.

Prominent researcher Dr. Bob Linderman of Plant Health, LLC offers testing services and consulting on sanitation methods appropriate for any size nursery. In a 2005 APS paper he stated, "Experiments were also conducted to determine the lethal temperature needed to eradicate *P. ramorum* from infested potting medium ... or contaminated plastic containers using aerated steam treatments over a range of 45-70°C (113°-158°F) for 30 minutes. Assays indicated that it was killed by temperature treatments of 50°C (122°F) or greater. These results show ... that infested media or contaminated containers can be sanitized by aerated steam treatment without melting the plastic."

Sanitizing pots and flats is one part of a nursery-wide sanitation plan. Once a steam source is available, the next opportunity is to pasteurize propagation soil. At Fall Creek Farm & Nursery in Lowell, Ore., propagation manager Paul Winiarski finds this works particularly well for tissue culture plantlets. It gives them a head start, and when combined with other sanitation methods, also reduces algae and liverwort problems.

Good sanitation seems to prove the adage that "an ounce of prevention is worth a pound of cure."

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