

Suggestions on Washing Used Nursery Production Containers, Regarding Weed Seed and Pathogens

by Mark Halcomb, Univ of Tenn Extension Area Nursery Specialist
and Dr. Alan S. Windham, Ph.D., Professor of Entomology and Plant Pathology,
Univ of Tenn Extension, Nashville
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Sanitation is one of the cornerstones of pest management. Pathogens and weed seed may be passed on to future crops. It is wise to consider the easiest and most effective method to disinfect used containers. Using new containers has been the easiest approach for larger, production nurseries. However, higher container prices in 2008 may allow reconsideration.

A study in Washington State found that *Phytophthora* could be isolated from the debris on the outside and bottoms of plastic containers (10% of containers had *Phytophthora* on the sides; 5% had *Phytophthora* on the bottom). *Phytophthora* was isolated from the soil under 90% of the containers sitting on soil, which points to the need of sitting containers on gravel, ground cloth or any substrate that will minimize contact with soil.

This also emphasizes the need to disinfect containers prior to re-use. I would suspect that you could also find *Rhizoctonia* (stem rots, web blight), *Thielaviopsis* (black root rot) and/or *Pythium* (root rots) on and in dirty containers. This also points to the need of stacking new containers on a concrete pad or similar surface to avoid contamination with soil or in a building to avoid even excessive wind blown dust.

Debris traps the seed and ties up any disinfectant used. It is critical to remove as much of the leftover and stuck on debris as possible from containers prior to soaking in a solution of disinfectant. A two step process will be best: first a hot water bath in a tub, vat or trough; followed by a cold disinfectant soak. The first step exposes the remaining pathogens and seed to the next step. Neither step should be short changed. Both are critical to the success.

A combination of water pressure or a soak accompanied with a brushing action to dislodge the seed is required. Containers should be loosely stacked horizontally to allow water to get between them if a soak is employed. Hot water is more effective in softening the organic debris and will speed the process. Decide when the debris has soaked long enough to be easily removed.

While working over the hot water vat, create an assembly line of several workers. Begin with a stiff brush, followed by a smaller brush to reach the inside corners, followed by a heavy rag, etc. It will be convenient for labor to rinse the container or brush back into the water periodically. A dirty container can be dropped back in for a longer soak and to not soil the brushes excessively. Labor should rotate positions periodically.

(Consider all options. Toilet bowl brushes are an option. Use the brush and your own devices to remove all of the visible organic debris while removing the containers from the soaking vat one by one.)

The containers can now be placed into a vat of cold water and disinfectant, with more soaking and some detail washing. Containers should be loosely stacked horizontally so that disinfectant can contact all surfaces of the container. The period of time recommended to kill all the pathogens may vary with the disinfectant used but generally longer is better. Green-Shield suggests a 10 minute soak; Zeritol does not list a soak time; household bleach could be 30 minutes to overnight. Avoid quick dips. Some rinsing may be beneficial.

10% household bleach has been the traditional disinfectant, mixed 9 parts water and 1 part household bleach. Technically, bleach does not have any horticultural uses printed on the label, which might be another reason to stick with a product listed above. The use of bleach might be open to interpretation by a zealous pesticide inspector.

Solutions should be replaced when they get visibly clouded with dirt and debris. Doing step one well will reduce the number of times the disinfectant must be replaced. Organic matter will tie up the chemical. One vat can serve both needs or use two different.

This is a task that can be performed when the weather is too nasty to be outside, assuming this can be performed inside. But labor could take this as a punishment task and adopt an 'I don't care' attitude. This is a difficult task to perform. Small clumps of mud can hide hundreds of seed.

It might be wise to explain the goals of the task: to hold down costs, maintain high standards, not create additional weed or disease problems for labor and additional pesticides to be required (costs), recycle, etc. It might be effective to ask everyone to pitch in and 'Get'r Done'. Builds teamwork. Alternatives are to ask the most conscientious workers to take on the task after explaining why or do it yourself.

A vat could be prepared at the end of the day and allowed to soak overnight. Mothers in the neighborhood might be looking for a few hours of work while kids are in school.

Provide labor with the option of using rubber gloves. There are several sources of protective equipment (PPE) (gloves, goggles, aprons). Insulated rubber gloves would be convenient in cold weather. Follow all PPE instructions on label. Both require face protection and gloves for handling and mixing concentrate. Other PPE requirements are detailed on label.

If you are creative and develop an easier method, please share your procedure along with images to mhalcomb@utk.edu

Comm/Cont/Disinfect Pots ed by AW 12-8-08

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