

Container Nursery Weed Control: Sanitation Practices to Prevent Weed Seed Contamination¹

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The most effective method of controlling weeds in container nurseries is to institute preventative measures. In general, the cost of preventing weed growth is substantially lower than the cost of managing weed infestations.

One theory is that weed seeds are introduced into the nursery in the potting medium. This possibility seemed worth investigating based on an informal survey of nursery weed management practices in north Florida, and considering practices used to harvest pine bark, a widely used component of potting mixes.

Are Weed Seeds Brought into the Nursery with Media?

Fresh potting medium was collected from three north Florida nurseries in February 2006 and stored indoors until June 2006. In early June, each substrate was put in 20 4-inch pots, and the 60 pots were placed in a greenhouse. Pots were irrigated as needed to keep the substrate moist.

Weed emergence was minimal - only three weeds were observed over 16 weeks, including bittercress and chickweed. The study was repeated in late September 2006. Two weeds were observed after four weeks - woodsorrel and bittercress.

Interestingly, four of five weeds occurred in the substrate from one nursery. Japanese climbing fern was observed in several pots during the summer but the fern spores might have gotten into the greenhouse through the open vents.

Results of this study concur with those of Cross and Skroch (1). They showed that bark and sand were not a significant source of weed seed introduction into the nursery. However, two of the weeds they found in the media, bittercress and common groundsel, are two weed species of special concern.

Bittercress and Common Groundsel

Infestations of bittercress and common groundsel can be managed or "controlled" by applying herbicides that prevent their emergence, or at least emergence of most of them (2, 3). And therein lies

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the problem. Rarely, if ever, do herbicides provide 100% control of these species 100% of the time. Weeds scientists consider >90% control as excellent. The problem is "90% of what?": 90 out of 100 means 10 weeds survive, 900 out of 1000 means 100 weeds survive, etc. Weeds that do emerge will exhibit varying degrees of tolerance to the herbicide. Those that survive are still capable of flowering and setting seed; therefore, they must be eradicated. Moreover, 90% control might not be acceptable for difficult to control species like bittercress and common groundsel (3). This might be part of the reason that these weeds remain as those often mentioned as problems, despite the number of preemergence herbicides that are available for their control.

Sanitation Practices

Approaches to weed management need to be more ecologically oriented, in much the same manner that has been espoused for insect and disease management.

- Become familiar with your potential weed problems. This, in part, means following up on accurate identification through your extension agent, diagnostic lab, or reference materials. Scheduling of preemergence herbicide applications must be based on when weed seed are likely to germinate under the weather and production conditions at your nursery. Note when weeds emerge in relation to the weather and the number of days or weeks after a plant is potted. Seed of some species don't germinate for awhile because they contain inhibitors that must first be leached out via rain and irrigation.
- Use a variety of preemergence herbicides with differing modes/sites of action for weed control. Long-term use of herbicides with the same mode/site of action to control a particular weed could result in that weed becoming tolerant to those herbicides.
- Preemergence herbicides usually need to be applied at specific intervals in order to maintain a high level of weed control. Weather extremes could alter these intervals. However, the number of times an active ingredient can be applied to a crop might be limited over a 12-month period.
- Closely monitor newly potted plants. Under nursery conditions, weeds could emerge only a few days after potting. Newly potted plants are very susceptible to weed infestation due to ideal conditions like well-drained and moist potting media, exposure to the sun, and good nutrient availability.
- If weeds do emerge soon after potting, note the location. If weeds emerge at the base of the liner, it is very likely that weed seed were brought in with the liner media (or the liner, or liner container, deflected the herbicide away from that area). If weeds are in the new media, weed seed were probably blown or splashed in.
- Be especially vigilant of weeds with effective seed dispersal mechanisms. For example, bittercress and woodsorrel use "explosive dehiscence" to eject mature seed up to several feet, and potentially further if caught in the wind or the breeze of a passing vehicle. Such weeds can infest a container even if they are growing outside a container bed.
- Maintain weed free zones, especially in and around potting areas, substrate storage areas, container beds, and propagation areas. Use mowing, living and nonliving mulches, nonselective herbicides, and noncrop herbicides with long residual activity where appropriate.
- A regular mowing schedule will minimize the number of weeds that are flowering and setting seed. When mowing vegetation surrounding a nursery bed or propagation area, direct mower discharge away from the bed or propagation area, use a mulching mower, or block the discharge chute so that clippings remain in the path of the mower. Be careful about use of string trimmers, which can throw weed seed in any direction.
- Check your shoes, socks, and pant legs. Seed can easily become lodged in the mud and soil of boots, shoes, and sneakers. Some seeds are especially adapted to cling/stick to passing animals, including you and your workers.
- Pots to be reused must be thoroughly washed inside and out to ensure that all remnants of soil or potting substrate are removed, both inside and

out. Weed seed are rarely visible and are often hidden in old potting substrate. Using warm, soapy water will help to remove seed in soil and attached to the pot, but will not kill seed. Including a 1 to 3 ratio of household bleach to water and soaking for 10 minutes in the washing solution helps with pathogens but does not insure that weed seed will be killed.

- When handweeding, make sure to remove roots fully. Some weeds will regenerate new shoots from roots, and such weeds will be even more difficult to eradicate later. This is an especially difficult problem when the weeds are more established than are the crops in the pots.
- Use liners and transplants that are weed-free, and that have been produced in weed-free areas. While the liner substrate might be weed free, if the liner was produced in an area that was not weed free, the liner substrate could contain hidden weed seed. When purchasing liners or transplants from a new or unfamiliar supplier, consider an informal tour of the operation first to see how well they manage weeds. In some cases, weed-seed-contaminated media near the surface (about 1/4 to 3/8 inches) can be removed prior to planting liners, and new, clean media can then cover up any seeds further below.
- Remove spilled media from beds. Any media that spills out of pots onto the container bed makes an excellent substrate for weed seed germination.
- Eradicate weeds growing under pots, or in the pot drainage holes.
- Cover piles of potting media whenever possible. A water impermeable barrier as simple as black plastic will help keep weed seed out of media and reduce loss of media and fertilizer with rain.

And finally, include weeds as part of your insect, mite, and disease scouting program. However, scouting for weeds is different than scouting for insects and diseases (4). Weed scouting is a continuous process of monitoring the effectiveness of your overall weed management program.

References

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