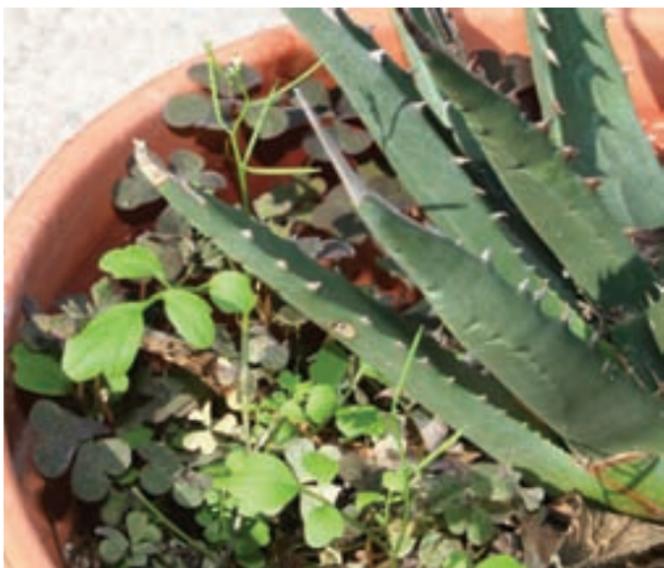


Greenhouse Weed Control Tips

Controlling weeds in the greenhouse can be quite challenging. Read on to explore the basics of weed management and learn about some best management practices.

By Fred Hulme



*Above: Bitter cress is among the fastest growing weeds. It can produce thousands of seed in less than 30 days. It loves moist conditions.
Below: Oxalis corniculata easily overtakes seedlings.*



The term “weed” is purely an economic expression that means “a plant out of place.” If you don’t want a particular plant to grow in a given place, it is a weed. When growers talk about weeds, they generally refer to certain plant species, such as oxalis, that are particularly aggressive in colonizing areas of growing operations; however, any plant can become a weed. To grow quality crops, one needs to optimize light, temperature, plant nutrition, irrigation and other cultural factors. It is no wonder then that vigorous, non-crop-type plants will find ways to capitalize on favorable environments and create big problems for growers. Controlling weeds in greenhouses can be a real challenge. Growers are trying to simultaneously prevent undesirable plants from growing while they nurture their crops in structures and conditions designed to support plant growth.

Impact of Weeds

Greenhouse weeds can definitely have a negative impact on the bottom line. Weeds will quickly exploit ornamental growing areas such as pots, beds, walkways and under benches — robbing crops of valuable nutrients, water and light. Besides detracting from the aesthetic appearance of the operation, weeds can also lead to reduced crop growth, crop losses and lower plant quality. Weeds can harbor insects, mites, rodents and other pests that can attack crops and vector plant diseases. Additionally, weeds can serve as alternate hosts for plant diseases.

Why are some weeds so difficult?

Common greenhouse weed species include oxalis (wood sorrell), chickweed, bitter cress, spurge and liverworts. A number

of features make these plants particularly efficient at exploiting the greenhouse environment when conditions are favorable:

- Quick acclimation to varying light, temperature and watering conditions helps weeds easily find a place in which to thrive.
- They may have a very short life cycle, growing from seed to flower in a matter of weeks; for example, oxalis can grow from seed to flower in as little as three weeks.
- Weeds may produce an enormous amount of seed per plant, enabling rapid infestation. Bitter cress, for example, can produce up to 5,000 seeds per plant.
- Weed seeds have mechanisms to spread far and wide through watering systems, via explosive capsules or wings that allow them to be airborne.
- Vegetative structures like stolons or rhizomes may be hard to remove, allowing weeds to quickly propagate and spread throughout the soil.
- Weed seeds can remain dormant for many years, waiting to spring up when the timing is right.

The bottom line is this: If weed seeds are present in the correct setting, weeds will thrive. Therefore, in trying to manage weed populations, focus on activities that support two key points: preventing weed seeds from entering the greenhouse, and minimizing the areas within the greenhouse where weeds can flourish.

Where do weed seeds come from?

There are a number of potential sources of weed seeds. Very commonly, ventilator fans often blow weed seeds into the greenhouse from the outside. Other potential sources include:

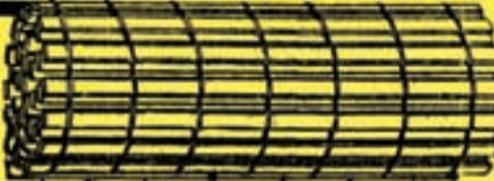
- Contaminated crop seed
- Infested plugs and rooted liners ▶

grower 101

- Infested plants shipped to the greenhouse from outside sources
- Ponds and irrigation systems
- Uncovered soil under benches, in walkways, etc.
- Poorly stored growing media, pots, plastic
- Adjacent fields, drainage ditches, etc.

Growing media can also harbor weed seeds. When considering growing media, look at raw material sources as well as processing and handling procedures. If you blend your own growing media,

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Crabgrass waiting to repopulate. Make sure growing media piles don't become a home for weeds.

strive to avoid adding weed seeds via the use of mineral field soil or other components that are poorly composted. Commercial growing media companies work hard to exclude weed seeds in their quality-assurance programs by actively managing weeds in their raw material sources, production areas and during shipping. Additionally, they aim to have consistent aging or composting systems for bark and other components to minimize weed seeds in the finished goods.

Do keep in mind, however, that most of today's mixes are not pasteurized prior to packaging or use, and there is some small potential for weed seeds to come in the mix. A grower's best bet is to buy from a company in which they have confidence and who can share with the grower the steps they take to ensure a clean, weed-free growing mix.

Exclusion

Keeping weed seeds as far away from your greenhouse as possible is critical to weed management. Controlling weeds outside of the greenhouse will provide a great payback. Frequent mowing between greenhouses, around the outside air vents' intakes and around irrigation ponds can be very effective. Non-growing areas are open to more chemical control options (compared to use of herbicides inside the greenhouse). Read herbicide labels carefully to be sure that any product you have selected is labeled for this purpose and you are following all the required precautions and use directions. The wide use of concrete floors, landscape cloth or gravel throughout the growing operation can also

minimize weed seed sources and reduce the number of places where weeds can grow.

Sanitation and Cultural Practices

Sanitation is a critical tool to prevent weeds from establishing themselves in your greenhouse. In fact, the simple broom can be a very effective tool to fight weeds! By constantly keeping floors and potting areas free of spilled growing media, you will minimize niche areas for weed seeds to become established. Here are a few other ways you can keep weed seeds from spreading in the greenhouse:

- Avoid reusing growing media from cull plants. While it may seem economically prudent, you will likely introduce weed seeds and disease to the new crop.
- Avoid reusing pots that haven't been thoroughly cleaned.
- Make sure your storage areas for bulk goods and racks are not infested with weeds.
- Don't store pallets of mix uncovered outdoors. Even if the product has shrink wrap and pallet caps, invariably there will be rips in packaging where weed seeds can enter.
- Wash down benches, floors and walkways with labeled biocides between crop cycles.

• If you have a gap in your production time, use it as an opportunity to clean up growing areas and discourage weeds from growing or spreading under benches and other areas. If this downtime is during warm and sunny weather, close up greenhouse vents and curtail water sources for several weeks to a few months. This will allow solar energy to build up in the greenhouse, creating a very

hot, dry, inhospitable environment for weeds.

Controlling Weeds

Inevitably, some weeds will find their way into your greenhouse. Once a weed infestation is established, weed control can be quite expensive and labor intensive. In many cases there are no viable chemical options, and hand weeding of even a small area can take many hours. To avoid the build-up of a heavy weed problem, continuously remove weeds and heavily infested plants from production areas when you're routinely scouting for pests or watering. Since weeds can reproduce so quickly, the sooner you remove observed weeds, the better.

There are some chemical options available, but they are not ideal solutions. In container nurseries and in the landscape, there are pre-emergent herbicides that prevent weeds from germinating. These products are very useful since they can attack weed seeds that have entered the growing area and prevent them from becoming a problem. These products, however, are not labeled for use in the greenhouse because of how they work and the potential liability. Many of these products can volatilize, and the resulting gases can easily injure the entire greenhouse crop. This is especially true in tight greenhouses designed to conserve heat. Additionally, soluble active ingredients can persist and mix with greenhouse condensation and rain down, damaging water drops onto your crops. If you have a heavily infested crop that is still worth saving, consider removing the plants from the greenhouse to the outdoors where there are more available, viable chemical options.

There are some nonselective, post-emergent herbicides labeled for greenhouse use and may be a last resort for heavy weed infestations. These products will essentially kill or injure all plant tissue that comes in contact with applied spray, so they can't be directly applied to the crop. When using these products, carefully read the entire label to avoid putting yourself and your crop at risk. Often one has to remove all crop plants from the area prior to application and ventilation fans have to be shut down to prevent herbicide drift into adjacent growing areas.

There may also be a required waiting period before crop plants can be safely moved back into the treated area. Improperly applied herbicides could contaminate the irrigation water source and lead to crop damage such as leaf distortion, bud loss, twisted stem,

etc. Given the economic pressures of today's marketplace, growers need to maximize the return of their production space. Weeds can eat away at the bottom line and need to be judiciously managed to maximize crop quality and safety concerns. **GPN**

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