



Greenhouse Sanitation Between Crops- 1.13.10

Jim Willmott, GGSPRO Technical Support Specialist, ggspro@griffinmail.com

Greenhouses provide ideal habitats for the survival of pests so when they are empty, for even a day or two, take advantage of the opportunity to “clean house” or sanitize. The goal of sanitation is to reduce pest populations and thereby lower the risks that they pose to crop quality. Remember that pests not only include insects and mites, but also disease causing pathogens, algae and weeds. Vigorous sanitation reduces these and saves time and money over the long haul.

Effective sanitation is a **three step** process:

Step 1. Habitat modification:

Pests require water and nutrients for survival and growth. Correcting poor drainage and areas of standing will reduce many pest problems. Shut down periods can be used to assess and improve drainage and inspect plumbing to fix leaks. While you are down on your hands and knees, check for gaps or holes in your structure that provide easy entry for rodents and other trouble makers. “Down time” between crops is also a great time to evaluate your ventilation and irrigation equipment. There have been many improvements in environmental control systems in recent years that are affordable and offer quick returns on investment. The G-Stat4 and the Step Up Controllers are good examples. Griffin’s construction department can help you determine the most suitable systems for your operation.

Step :2. Clean:

Cleaning can be accomplished physically, chemically or through a combination of both depending on your situation. Whichever method is used, it must remove debris from surfaces since it will interfere with the activity of disinfecting products applied in step 2.

- Physical cleaning should remove all debris (e.g. potting media, soil, plant residues, excessive algae, moss) from surfaces including benches, floors, walls, potting tables, conveyors, equipment and tools. The most common options are power washing, vacuuming or sweeping. Always, take steps to insure fresh potting media is not contaminated by any resulting airborne particles which may contain pathogens.
- Chemical cleaning is a relatively new and efficient process. It is accomplished with Strip-It which is a unique blend of acids, surfactants and wetting agents which together produce maximum cleaning results with no need for mechanical scrubbing. It is safe to use on stainless steel, aluminum, iron, concrete, plastic, poly and glass, if used at the recommended dilutions and rinsed prior to drying. Do not allow Strip-It to contact growing plants or areas where bulbs are to be planted. Strip-it is a concentrate that is mixed with water and sprayed. Foamer nozzles are available to improve adherence and cleaning action on vertical surfaces.

Special Concerns:

Algae are single celled, photosynthetic organisms that thrive in most greenhouses. Accumulations are unsightly, slippery, and a food source for exploding populations of fungus gnats and shore flies. Greenshield, KleenGrow, ZeroTol and Xeroton-3 can be sprayed on algae for quick control on greenhouse surfaces. Before you spray one of these products rake up plant debris, or use a “Shop Vac” on concrete floors. GreenClean is a granular product that cleans up algae and provides some residual

control as well. Only Zerotol and Kleengrow are labeled for over the top of plants for algae control. The product labels contain cautions for safe use. When treating floors don't forget benches, baseboards, or any other hard surface that is hosting algae. Reducing the food source for fungus gnats and shoreflies makes control measures more effective. Clean holding tanks and other irrigation equipment between crops with Ultra-shield (chlorine dioxide) or Strip-it to remove biofilm, algae and other deposits. Ultra-shield cleans and disinfests. If Strip-it is used follow it with a disinfestant such as: Greenshield, Kleengrow, Zerotol or Xeroton-3. To maintain the irrigation system in a clean state apply Zerotol or Xeroton-3 as a constant injection or apply KleenGrow pulse treatments as needed.

- ✓ Weeds must be addressed since they host insect, mite and pathogen pests. Weed control is a never ending project for many growers, but it is worth every bit of the effort. Even a few weeds left to limp along in a greenhouse shut down for the season is enough to harbor a supply of insects, mites, and certain diseases. Manually pulling weeds is effective but time consuming. There are a few non-selective post-emergent herbicides that can be used in greenhouses: Envoy (grasses only), Finale, Sycthe and glyphosate containing products (Round-Up Pro, Glyphosate Pro, Touchdown Pro and Razor Pro). Only Envoy, Finale and Scythe are labeled for use while there are plants present in the greenhouse. Whether you spray or pull the weeds, some weed seed will be left behind. Unfortunately, there are no preemergence herbicides labeled for use in greenhouses. Many cases of severe crop loss have been traced to the use of pre-emergent herbicides in greenhouses. It is not worth the risk! Covering floors with ground cover fabric from Griffin can help you get the upper hand on weed control.

Step 3. Disinfest:

This step is more effective when completed after step 2 (cleaning). Here we seek to kill pathogens on benches, floors, equipment and other surfaces with chemicals. While most people refer to these chemicals as disinfectants, the more correct name is disinfestants since plant pathogens infest rather than infect such surfaces. The most commonly used disinfestants are GreenShield, KleenGrow and the oxidizing agents Oxidate, Sanidate, ZeroTol and Xeroton-3.

GREENHOUSE & NURSERY SUPPLIES

Products for Disinfesting Greenhouse Surfaces		
Product	Active Ingredient	Comments
Greenshield	20% quaternary ammonium salts	Surface must remain wet for at least 10 minutes.
KleenGrow	7.5 % advanced 5 th generation Q-Salt	Advanced Q-salt. Active for up to 30 days after application.
GreenClean Pro	85% sodium carbonate peroxyhydrate	Specifically for algae and moss. May be applied as a dry granular, a solution or foam. Do not apply to painted surfaces.
Sanidate	18.5% hydrogen peroxide 12% peroxyacetic acid	Applied as a solution. Thoroughly wet surfaces. Scrubbing may be needed to remove heavy algae or fungi
Xeroton -3	6.9 % hydrogen peroxide 4.4 % peroxyacetic acid 3.3 % Octanoic acid	Apply as a solution. Thoroughly wet surfaces for a minimum of 10 minutes and allow to air dry.
ZeroTol	27 % hydrogen dioxide	Apply as a solution. Thoroughly wet surfaces for a minimum of 10 minutes and allow to air dry. Foam applications are recommended for porous or vertical surfaces or others that do not retain solution.