

GROWERTALKS

Growing With Griffin

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Algae Growth: How to Prevent a Slippery Slope

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Algae on a floor or walkway is a known slipping hazard. It ranks right up there with cartoon banana peels or a bunch of marbles on the floor! That means algae is no laughing matter in your production or sales areas. Moreover, the risks associated with algae extend beyond human injury.

Where can algae grow?

On the soil surface in pots, algae can interfere with water penetration and drying of the soil. Its growth robs the plant of nutrients and decreases the soil oxygen levels. Algae can also grow on the foliage, blocking light required for photosynthesis. As if interfering with growth isn't enough, algae also provides a hatchery and food source for both fungus gnat (*sciaridae*) and shore fly larvae (*ephydriidae*) wherever it exists.

Does algae affect plant growth?

In hydroponic production, algae can have an even more "interesting" effect, at least for those with either a dark sense of humor or a love of science. Unchecked algal growth can cause extreme pH swings in recirculated hydroponic systems of 1 to 2 pH units. This can cause growers or automated controllers to wildly ping-pong back and forth, alternately adding acid and base in a quest for acceptable pH readings throughout the day. The pH swings occur with the light and dark cycles as photosynthesis is carried out by the algae. (Carbon dioxide exists in water as a weak acid, carbonic acid.)

During photosynthesis, as carbonic acid is used, the pH of the water will rise. During dark hours, CO₂ will re-equilibrate between the air and water, lowering the solution pH again. At this level of algal infestation, shore flies and fungus gnats may flourish. Additionally, decomposing dead algae removes oxygen from the water, depriving the roots.

Preventing the establishment of algae is the most effective control strategy. Once algae takes up residence, a grower is sliding down that metaphorical slippery slope, grasping for control. It can be hard to reign in this green slime (as well as the black, brown or red genera). For prevention, it helps to understand how algae spreads and where the inoculum lurks within your production areas.

How does algae reproduce and spread?

Algae reproduce by both sporulation and by simple cell division. Spores can be airborne and can cling to greenhouse surfaces, including the greenhouse glazing, where they can persist for some time. When the spores

drift to an area of ample moisture, growth begins. Thorough cleaning of the empty production space, using either an acidic cleaner or chlorine-based cleaning product, will kill the algal masses on plant supports, floors and surfaces. Cleaning is followed up with a disinfecting sanitizer to eliminate residual algal spores on surfaces. (The chemical class of products commonly used is listed in Table 1.)

Table 1. Cleaning and sanitation products.		
Algae Cleaning Products		
Treat floors, walls, hydroponic troughs or channels, benches and supports. Rinse copper or aluminum (soft metals) as soon as possible. These are strong cleaners—obey all label precautions and personal protective equipment requirements.		
Chemistry	Representative Products	Uses/Notes
Acid plus Detergent Cleaners	GreenClean Acid Cleaner (BioSafe Systems)	Do not use in presence of plants. Greenhouse surfaces/glazing: Use as spray or foam, allow 10 to 15 minutes contact time. Rinse before the surface dries; provide adequate ventilation. Listed products allowed in food packing areas.
	Strip-It Pro (Pace 49)	Water system: Apply through the injector, fill lines (no lead emitters). Soak overnight, rinse copiously or until pH returns to normal.
Chlorine-based Cleaners	Horti-Klor (Pace 49)	Do not use in presence of plants. Indoor growing and packing areas: Use as spray or foam to sanitize surfaces, allow 10 to 15 minutes contact time followed by rinsing. Listed products allowed in food packing areas.
Sanitizing Products		
Major classes of sanitizers used in horticulture. Specific uses and locations vary widely on product labels.		
Hydrogen Peroxide and Organic Peroxides	Jet-Ag	Check the product labels for your intended use. Some common uses include surfaces, irrigation lines, water treatment by pulse or continuous injection, evaporative coolers, food processing sanitation, fungicide.
	PERpose Plus SaniDate 5.0 and 12.0 ZeroTol 2.0 Others	Add foaming agent for vertical surfaces. Use test strips to maintain effective concentration where sanitation stringency is required.
Quaternary Ammonium Compounds (QAC)	GreenShield II Kleengrow Physan 20 Others	Check the product labels for your intended use. Sanitizers for surfaces, irrigation lines and ornamental crops. No direct food or food irrigation water contact. Some products maintain residual activity after drying. Use QAC test strips to maintain effective concentration where sanitation stringency is required.

Algae lurking in the water system is the leading cause of algae growth on soil surfaces. Contaminated water lines provide a continual source of inoculum for hydroponic systems, drip irrigation systems, walkways and other greenhouse surfaces. Water systems are best cleaned when no plants are on the line or in the greenhouse. Strongly acidic cleaners, like GreenClean Acid Cleaner or Strip-It Pro, break down the algae, biofilms and the mineral deposits that build up. Once algae has been dealt a deadly blow, a sanitizer should be used to disinfect the water system.

For algae control in and around crops, several of the sanitizer products listed can be used for preventative maintenance, either periodically or by continuous injection in the water. Furthermore, oxidizing sanitizers, such as SaniDate12.0 or ZeroTol 2.0, can be used to clean irrigation lines while “in use.”

After soaking the system overnight with an oxidizer, the bulk of the algae and sanitizer is flushed through an opened drain valve before irrigation, since it may not be fully broken down. This cleaning may need to be repeated for highly fouled water lines. **GT**

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