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Control of Mosses and Algae Under Greenhouse Conditions

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Mosses and algae are a problem to many greenhouse growers. They are unsightly and can lower the commercial value of plants and present a hazard of slipping on slick walks in the greenhouse.

With the increased attention to energy conservation and the corresponding lack of ventilation in greenhouses, humidity problems will likely increase. This increases moss and alga problems, and growers will have to give more attention to their control.

Most mosses have a plant-like appearance — they are green and produce a fuzzy or tufted plant-like growth on the surface of pots, soil or other greenhouse structures (Fig. 1). By contrast, algae come in many forms and colors. They may be tan-to-olive-to-green-to-near black (Fig. 2). Usually, they are characterized by a thin, slimy-appearing growth on the surface of pots, media, benches, sidewalks, and other greenhouse surfaces. Both mosses and algae are high moisture requiring plants. They also thrive best in intermediate light or shade. It is important to remember these factors when considering control.

High humidity or standing water are common in a greenhouse where mosses and algae are found. These conditions can be remedied by improving drainage, reducing the amount or frequency of watering, and increasing ventilation or air movement. Surfaces that dry quickly and remain dry for several hours between waterings do not favor the development of mosses or algae. When constructing a greenhouse, it is not only important to be aware of the water source, but also the drainage patterns in the house and how the water that has passed through the plant pots will soak into the ground or leave the greenhouse. Problems first occur where water tends to puddle or floors stay wet for a long time.

Slope cement walks slightly so that water will run off rather than puddle. If the walkway is not to be used for wheeled vehicles, one good way to avoid algae problems is to use gravel or cinders rather than cement. These particles move as foot traffic goes over them repeatedly, and algae has a very difficult time establishing itself. They also provide better traction and prevent the surface from becoming slippery. The addition of gravel or cinders usually raises the foot-path an inch or so, and allows the top of the walkway to drain and dry quickly after watering.

Mosses and algae growing in plant containers are a sure sign of overwatering, high humidity and/or



Figure 1. Moss on soil indicates excess moisture and poor air circulation.



Figure 2. Dark green to black algae on surface of soil. Flats are overwatered and drainage is poor.

ceiling drips due to condensation. Changes must be made in watering and ventilation patterns or greenhouse structure before the problem can be permanently eliminated. Once the basic cause is remedied, the soil surface in the plant container may be cultivated to break up the moss or alga growth so that good water penetration is restored.

If physical changes in the greenhouse do not solve the problem of mosses and algae, chemical controls are available. The surface to be treated will determine the chemical to use for control. If the surface will at some time come into contact with live plants or plant roots (Fig. 3) use a chemical which is not toxic to higher plants. Most copper compounds, such as copper hydroxide, copper oleate, cuprous oxide, copper oxychloride sulphate, copper oxychloride, copper 8-quinolinolate, etc. (Table 1) are good moss and alga killing agents. Any copper fungicide used on plants for disease control may be used at the same rate to treat benches, pots, or media surfaces which have plants growing in them or will at some point be exposed to living plants.

Greenhouse walls, walkways or bench foundations which do not come into contact with plants can be treated with copper fungicides or a number of materials which are phytotoxic. Soluble copper sulfate and copper naphthanate are such materials and may be used on nonplant surfaces to control the mosses and algae as well as act as preservatives. If the moss and alga problem appears to be a temporary one, and only a short-term treatment is required, mix household bleach at 1 part to 9 parts water for excellent control, and the chlorine will dissipate in a short time leaving no residues. However, bleach at this concentration is phytotoxic to most plants on contact.



Figure 3. Moss and algae on soil surface. Do not use chemicals toxic to "higher" plants (plants with roots, stems and leaves).

For the walkways and floor of the greenhouse, and under benches, a number of highly phytotoxic substances can be used for moss and alga control. Some greenhouse operators use soluble copper sulfate (2 lbs. per 100 gal. water), which has an excellent phytotoxic effect on mosses and algae as well as other weeds. Soluble copper sulfate has the added advantage of being a fairly long residual compound, thus eliminating the need for frequent retreatments.

Another compound that has been used with excellent results is highway salt (calcium or sodium chloride). This material, when scattered under benches and on walkways, is extremely toxic to algae, mosses, and weeds. Some weeds require a fairly heavy dose of salt in order to bring about a season-long kill. None of the above chemicals are permanent, and occasional retreatment must occur unless the environmental factors which favor moss and alga growth are remedied through changes in cultural practices or physical changes in the greenhouse.

TABLE 1. Copper Compounds Which May Be Used For Moss and Alga Control in the Greenhouse.

<i>Chemical Name*</i>	<i>Trade Name</i>
Copper Sulfate Pentahydrate (soluble)	Copper sulfate, Blue-stone, Blue Vitriol, etc.
Copper Sulfate Monohydrate	Neutrocop, Spray-Cop, Nu-Cop, etc.
Copper Oxychloride Sulfate	COCS, Vitigran, Copperfine, Copro-53, etc.
Copper Oxychloride	Basic Copper Chloride, Microcop, Coppesan, etc.
Basic Copper Sulfate	Tri-basic, TBCS-53, Basicop Copper, etc.
Copper Hydroxide	Kocide 101
Cuprous Oxide	Copper Oxide, Cupuris Oxide, Yellow Cupro-cide, Brown Copper Oxide, etc.
Copper Ammonium Complex (Ammoniacal)	Copper Count N, Oxy-Cop 8L, Cal-Cop 10, For-Cop 80, etc.
Copper Linoleate-Oleate	Cit Cop 4E, etc.
Copper-8-quinolinolate	Cunilate, Penetraat
Copper Naphthenate	Copper Naphthenate, Naptox, Copper-Cure, Coppernate, Cuprinol, Cuprenol Green, Cuprenol Brown, Rot-Not, etc.

***These compounds are available in a variety of formulations, hence the user should read and follow label recommendations concerning dosage rates. Consult your county Extension office if more information is needed.**