

Pond Facts #22
Chara and Nitella



Nitella



Chara

Description

- Both Nitella and Chara look like rooted, aquatic plants, but both are actually a form of algae.
- Both have whorls of branches coming off the main stem and are common in Pennsylvania ponds and lakes.
- Chara prefers alkaline, hard water ponds, while Nitella prefers more acidic ponds with soft sediments.
- Nitella branches are very smooth and translucent green, while branches on Chara are ridged.
- The branches of Chara are encrusted with calcium carbonate, giving it a gritty feeling.
- Chara also has a musty odor when crushed, giving it the common name of “muskgrass.”

Value and Concern to the Pond

- Both of these algae are generally valuable to the pond and lake environment.
- Branches of Chara and Nitella are eaten by waterfowl and serve as important grazing locations for pond insects that in turn become food for pond fish and other wildlife.
- Both can grow abundantly under the right conditions, but Chara is more likely to reach nuisance levels.
- The rhizoids (rootlike structures) on these algae stabilize the bottom sediments to prevent muddy water.

Prevention

- Excessive growth of Chara and Nitella is caused by excessive nutrients (phosphorus and nitrogen) in the pond water from nearby barnyards, crop fields, septic systems, lawns, and golf courses.
- Control of overabundant algae like Chara and Nitella is best accomplished by reducing or redirecting nutrient sources from the pond. This can be accomplished by reducing fertilizer applications near the pond, maintaining septic systems properly, redirecting nutrient-rich runoff away from the pond, and maintaining vegetative buffer strips around your pond.

Physical Control

- Both Chara and Nitella can be controlled through physical pulling, raking, and cutting, but this control will be short lived. Both of these algae will recolonize through spores and fragments left behind after harvesting.

Biological Controls

- Grass carp can be used to control both Chara and Nitella because they are among their preferred foods.
- Grass carp must be purchased from an approved hatchery after receiving a state permit.

- Consult the triploid grass carp fact sheet available from your local Pennsylvania Fish and Boat Commission office or online at water.cas.psu.edu/ponds.htm.
- Relatively new products composed of bacteria and/or enzymes are available to control algae growth. The bacteria and enzymes feed on nutrients in the water, making them unavailable for algae growth.
- Bacteria/enzyme products have specific requirements and can be pricey, but they can be very effective.

Chemical Controls

- The table below lists several aquatic herbicides that are effective in controlling Chara and Nitella. When used appropriately and following the label instructions, they can be safe and effective management tools.

Trade Name	Active Ingredient	Dosage Rate	Notes
Aquashade (Dyes)	Acid blue 9 dye: 23.6% Acid yellow dye: 2.4%	1 quart/acre-ft	Dyes not permitted for ponds with a significant outflow to a surface stream; should be used early in growing season
Citrine-Plus, Citrine Ultra, Earthtec, K-Tea	Various percentages of elemental copper	Citrine Plus granular: 60 lbs/acre Citrine Plus liquid: 0.6–1.2 gal/acre-ft Citrine Ultra: 0.6–3 gal/acre-ft Earthtec: 0.22 gal/acre-ft K-Tea: 0.7–1.7 gal/acre-ft	Should not be used in ponds with trout, carp, koi, channel catfish, or other sensitive fish
Hydrothol 191	Monopotassium salt of endothall 53%	0.6–2.2 pints per acre-ft	Fish can be killed at dose > 0.4 gal/acre-foot; some water use restrictions

Here are some tips to properly using an aquatic herbicide to control Chara or Nitella algae:

- Keep in mind that chemical control is often necessary every year or even multiple times during a year.
- Positively identify the problem in your pond as Chara or Nitella before proceeding with chemical control.
- Carefully measure the pond area and/or volume to determine the amount of herbicide needed. Consult the fact sheet titled *Pond Facts #4: Measuring Pond Area and Volume* for more information.
- Before applying a herbicide to your pond you must obtain a permit. The permit process requires submission of a completed two-page form titled *Application for Use of an Algaecide, Herbicide, or Fish-Control Chemical in Waters of the Commonwealth* that is jointly reviewed by the PA Fish and Boat Commission (PFBC) and PA Department of Environmental Protection (DEP). The permit application can be obtained from a local PFBC or DEP office, extension office, or online at water.cas.psu.edu/ponds.htm.
- Aquatic herbicides can be purchased from some home- and farm-supply stores, hardware stores, or various online suppliers. Costs can range from less than \$100 to over \$1,000 to treat a one-acre pond.
- *Follow the herbicide label carefully.* It gives specific instructions on when and how to apply the chemical.
- Herbicide treatments should be done early in the growing season before the plants cover a large portion of the pond. Treatment of severe infestations may cause a fish kill due to reduced dissolved oxygen.

Additional Resources

For further information and publications on pond management, visit our Web page at water.cas.psu.edu/ponds.htm or contact your local cooperative extension office.

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