

ALGAE MANAGEMENT

Introduction – Ponds and lakes are similar to any landscape, in that they are dynamic systems and require monitoring and maintenance to proactively manage. They are comprised of relationships between 1) physical - size, shape, depth, erosion, and composition; 2) chemical – water and sediment composition, nutrients, dissolved oxygen; and 3) biology – plants, algae, fish, and wildlife. So, algae growth is an essential component within a balanced aquatic ecology. Wherever there is sunlight and water, in time, there will be some algae growth, though the density and species will vary. The key is controlling growth to allow for a healthy ecology while preventing nuisance growth levels. This requires a management plan based on monitoring conditions present and implementing timely efforts.

Some of the methods that are assessed in determining the best management practices for controlling nuisance growth are outlined below. The effectiveness or practicality of utilizing any of these methods is dependent on the conditions present and the client's goals and budget.

Various Nuisance Control Strategies

Aluminum Sulfate is used to precipitate phosphorus (a major aquatic plant nutrient) from the water column and reduce its release from bottom sediments. Pond sediments treated with alum may release fewer nutrients and prevent excessive algae blooms. Alum will not affect the growth of aquatic plants except for reducing algae and improving water clarity, improving conditions for aquatic plant growth. Alum will not bind to new phosphorus entering the pond so nutrient inputs should be reduced before treating the pond. The application of alum involves calculations based upon pH, hardness and water volume. It is recommended that a professional pond management firm be consulted prior to using alum.

Bacterial & Enzyme Products – every pond has naturally occurring bacteria and microorganisms that aid in the decomposition of organic material, i.e. dying vegetation, leaves, and the like. Treating the pond with concentrated doses every two weeks during the season (May-August, when water temperatures are most conducive to growth) increases the concentrations of these populations also allows them to compete with algae and aquatic plants for nutrients, especially nitrogen and phosphorous. Nitrogen and phosphorous are the primary nutrients that allow algae blooms and nuisance growth. These products can work effectively in many ponds under the proper conditions, with sufficient dissolved oxygen and organic substrate, but they are susceptible to copper based algaecides. Thus, using these products as part of an overall strategy, in conjunction with limiting phosphorous fertilizers, reducing copper algaecide applications, and allowing the growth of some filamentous algae. One method currently used to increase the effectiveness of copper algaecide is the addition of Aqua-Prep, an enzyme based product that increases the effectiveness and allows for less copper to be applied. The benefit is that while controlling algae growth, bottom sediments are reduced and pond ecology is improved.

Limit Nutrient Inputs for any algae treatment to be effective. Just like terrestrial plants, aquatic plants including algae need sunlight, water, carbon dioxide and nutrients including phosphorus, nitrogen, potassium and calcium to grow. The primary source of nutrients is the watershed. The addition of houses, paved driveways and other hard surfaces add to the amount of nutrient-rich runoff as well as the sediments, manure, pet wastes, improperly maintained septic systems and misapplication of fertilizers on lawns that can go along with the houses.



Copper Based Algaecides – are currently the primary control method in area pond(s). These products are used because they have ZERO WATER USAGE RESTRICTIONS, they do not harm wetland plantings and they cost effectively reduce algae growth. However they do have limitations, as the copper is heavier than the water and it settles into the sediments. To compensate for this, the copper is in an emulsified solution, which allows it to remain active in the water column for several days. Application rates are made at 0.6ppm (0.6 pounds of copper per 1 million pounds of water), thus they have minimal long-term build-up. Contact time of algaecide and algae is important, so in ponds where there is flowing water, granular Copper is often more effective.

Hydrogen Peroxy Products – a recent product introduction in the chemical family of hydrogen peroxide, H₂O₂, which rapidly oxidizes to water, oxygen, and calcium carbonate. While the product bonds break apart, they rapidly react with organic materials in suspension in the water column. There are no harmful side effects when applied at label rates, but there is a limited time of effectiveness. These products are best suited for small site applications, but improved chemistry formulations allow them to be applied for planktonic algae blooms in larger scale projects. Barley straw products in the proper conditions decompose to produce a natural hydrogen peroxide chemistry.

Pond Dye – colorants are used to limit the amount of sunlight coming into the water column thereby reducing plant and algae growth. The dyes are generally blue and are usually non-toxic, water-soluble and degrade over a period of weeks. Dyes may reduce the need for other management strategies, however if your pond has an occasional outflow it will be difficult to use a dye without discharging the colored water downstream. Considerations are water clarity and client desire for the coloration of the water. They are most effective in ponds where the water depth averages over six feet. The product does little to assist in controlling shoreline algae and plant growth, thus areas often experiencing the greatest algae growth would not benefit from the use of these products.

Pond Snails – are an excellent addition to help balance the ponds ecology, but they are only effective if algae growth is ALREADY LOW. Where algae growth is severe and algaecides are required, even moderate levels of copper can impact snail populations. Snails are helpful only if some algae growth is tolerable during the season, often 3% - 10% surface coverage depending on algae species present.

Sterile Grass Carp – can be effective at reducing SUBMERGENT PLANT populations, FILAMENTOUS ALGAE is not part of their normal diet. Grass Carp cannot be stocked into ponds that discharge water into rivers and streams. Finally where they are most needed (shallow ponds) they would potentially die from summer heat or winter low dissolved oxygen levels.

In summary, controlling nuisance algae growth benefits the pond ecology and aesthetics. There are several tools available to assist in managing growth rates. Depending on conditions present and dynamic variables monitored, the most suitable products or methods will be implemented. Algae management practices have both positive and negative characteristics. If used properly, they can be beneficial to a pond's well being. Management of algae problem do not end once the blooms and mats are reduced or eliminated. It is critical to continually monitor problematic areas for regrowth and treat as necessary. An association or property owner should not always expect immediate results. A quick fix of the algae problem may not always be in the best interest of the pond. Sometimes the best solutions take several seasons to show long-term benefits and work to rebalance the ecology of the water body.

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