

Weed and Algae Control in Ponds

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Aquatic plants, which include algae and higher plants (macrophytes), are the primary producers in freshwater ecosystems and provide critical structure and function. Through photosynthesis, primary producers take up carbon dioxide from the water and release oxygen that is critical to the survival of fishes and other organisms. Algae are eaten by primary consumers such as zooplankton and snails which are in turn eaten by fish or decompose and contribute to the detritus in the sediment. Macrophytes provide cover for fishes and invertebrates from predators, shade to reduce water temperature, and forage for waterfowl. Macrophytes also contribute significantly to the aesthetic attraction of ponds.

Excess algal biomass (algae blooms) is prompted by abiotic (non-living) and biotic (living) factors. Blooms result when increased nutrient levels within the pond become available for algal uptake in combination with warming of the water and a release from zooplankton grazing. That is, too much fertilizer, warm water, and too few grazers leads to an algae bloom. Not only are these blooms unsightly, but they limit light penetration for submersed macrophytes and disrupt natural diurnal (day/night) changes in dissolved oxygen and pH. Changes in dissolved oxygen and pH occur because during the day the algae are photosynthesizing very rapidly, raising the dissolved oxygen and pH; however, at night they respire. Like mammals, respiration involves taking up oxygen and releasing carbon dioxide which is stressful to fish and invertebrates (i.e. grazers) that require dissolved oxygen. Wide fluctuations in pH are similarly caused by increased photosynthesis (day) and respiration (night) rates and is stressful to fish and invertebrates.

Excess macrophyte growth occurs when plant diversity is low and “weedy” species are present. Dense weed growth limits light penetration for benthic (bottom) organisms and physically limits mixing of oxygen into the pond from the atmosphere. Surface water temperature also increases greatly within dense

weed beds. Much like weeds in our yards, aquatic weeds tend to grow rapidly and easily spread by stem fragments or rhizomes. Weeds may be intentionally planted or inadvertently introduced with more desirable species. Research has demonstrated that fragments and seeds of weeds are commonly found hitchhiking with other plants.

Preventing algae blooms and excessive weed growth is the first line of defense. Algae are typically phosphorus-limited and rooted aquatic plants are more often nitrogen limited. By using lake-friendly lawn fertilizers, excess phosphorus can be avoided. Proper filtration (mechanical and biological) can assist in eliminating unwanted debris and ensuring the nitrogen cycle is properly maintained to avoid toxic ammonia build-up. Prevention also involved selecting aquatic plants that are appropriate for your pond. Again, like our yards, rapidly growing plants are considered weeds for a reason. If something sounds like too much of a good thing, it probably is. A diverse plant community will provide the necessary structure (shade, trapping debris) and function (taking up nitrogen and micronutrients) to help maintain a healthy ecosystem.

Controlling excessive algae and weed growth can be an ongoing endeavor if the ecosystem is drastically out of balance. Thus, control activities should come with a plan to reset the ecosystem if possible. To reduce algae growth, shading products or dyes can be used to limit light penetration and reduce or eliminate photosynthesis. These products are not a long term solution but may be used until appropriate macrophytes are established. More importantly, the addition of “beneficial” bacteria will consume nutrients otherwise used by the algae. Professional pond care providers cannot over emphasize the rewards of beneficial bacteria that also break down sludge along the bottom and reduce pond odor. Copper-based products may also be used to control algae, however, a lake management professional should be consulted to avoid copper toxicity and determine if permits are required in your area.

Dense weed growth can be controlled by manual, physical, or chemical means. Owners of smaller ponds will likely choose to simply rake or hand-pull unwanted vegetation. While common two-sided thatch rakes will work, aquatic

weed rakes are available. Physical barriers can be placed along the bottom of the pond to reduce the growth of rooted weeds. These large sheets work similar to shade barriers used in yards by preventing light penetration. They can be difficult to install when air bubbles are trapped or hardscaping structures make the surface uneven. Care should be taken when removing these barriers as toxic ammonia and hydrogen sulfide may be released. A limited number of herbicides are registered for aquatic applications. Their mode of action is either systemic (killing the entire plant) or contact (killing parts of the plant) and they are either selective, affecting a select group of plants, or non-selective, affecting all plants it contacts. The use of Environmental Protection Agency (EPA) registered herbicides requires a permit in many areas, particularly if a pond is hydrologically linked to "waters of the state". You should always check local requirements before proceeding with an herbicide application and the product label should be carefully inspected to determine impacts to fish and other organisms in the pond.