Aquatic Vegetation & Control

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Aquatic vegetation is found in most lakes and ponds and is beneficial to the natural ecosystem. It provides food and cover for aquatic organisms, produces oxygen, and stabilizes bottom sediments.

Aquatic plants are often referred to as "Weeds". This is improper terminology. The definition of a "weed" is — any undesired plant that grows so profusely as to crowd out more desirable plants, or detracts in some way from the usefulness and/or appearance of an area. Unfortunately, many ponds and lakes develop overabundant aquatic vegetation which interferes with recreational activities, and destroys aesthetic values. This, then is a "weed problem".

First of all let's look at the Aquatic Plants, or in this case, weed's home. Whether it is a pond, lake, creek, or river its home is a body of water that is constantly changing. Aquatic plants and algae contribute to this change by Photosynthesis. In the process they contribute to the dissolved gases in the water, and add inorganic nutrients, contributing to the food cycle of the body of water. They modify the physical environment, providing protection and habitats for other plant and animal life in the environment. But ponds and lakes change in another, more profound way. Nature never intended that they exist forever. From the day they were formed, their life processes lead them inevitably toward their destruction. This process is known as euthrophication, a natural aging process whereby silt and decaying plant and animal materials gradually fill in the depression that formed the pond. All plants require nutrients and sunlight for growth. The depth of sunlight penetration limits the depth to which plants can grow. At the same time, the amount of nutrients available, basically nitrogen and phosphate, will limit the quantity of vegetation which can grow.

Unfortunately, nutrient enrichment of water bodies or as I said autrophication, is enhanced by man's agricultural, industrial, and domestic activities. The smaller and more fertile the pond is, the faster this process takes place. Aquatic plants and algae are the largest contributors to the process, and each season's addition speeds up the process by releasing additional nutrients. It is a never ending cycle. Man has greatly increased the rate at which eutrophication occurs. Run off from fertilized fields and in some cases, effluent from sewage systems reaches these bodies of water. The resulting high nutrient level of our ponds encourages algae and plant growth at a rate well above normal. Without corrective measures, in the form of good pond management, these ponds and lakes would die much more rapidly. The selective control of plants and algae is a vital part of this management.

There are basically three corrective methods available for removal of aquatic weeds: Mechanical, Biological, and Chemical. **Mechanical** removal involves physical methods used to remove plant material from bodies of water. Techniques include pulling, raking, digging, skimming, cutting, shading, draining, dredging, etc. Equipment costs can range from practically nothing to an investment of thousands of dollars. Pulling or cutting weeds can, however, compound the problem by reestablishing themselves from fragments into new areas.

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Biological controls entail finding safe and effective natural methods for controlling weeds and algae. Although some methods have shown promise, most involve the introduction of exotic organisms with unknown long term ecological consequences. An example would be the White Amur which have been introduced as an aquatic herbivore (weed and algae eaters). Unfortunately, there is not enough known about their reproductive potentials, competitiveness and habits. **Chemical** method — The use of chemicals is the most common and effective method for controlling nuisance weed and algae growths. Chemicals offer longer lasting control than mechanical methods, involve less physical labor, and ultimately cost less. Certain chemicals and application rates selectively control only target weed species, hence; the applicator has the option of treating only specific nuisance weeds.

The next step then in solving your "aquatic nuisance problem" is to identify properly the algae and or weeds present in your body of water.

Algae are small primitive plants. They do not have true leaves or flowers, but reproduce by means of minute spores or by continued vegetative growth. They can be found floating or attached to submerged surfaces in most lakes, ponds, and streams. Depending upon the nutritive value of the water, algae reproduces very rapidly; especially in hot weather. There are **three** types of algae generally found in most lakes, ponds, and streams. There are classified as:

1) Filamentous Algae
2) Unattached or Planktonic Algae and
3) Branching Algaea

1) **Filamentous Algae** are commonly referred to as pond scum and consist of growth of long stringy, hairlike strands. Most of the green and brown scums are slimy or cottony in appearance.

2) **The Unattached or Planktonic Algae** are those types which cause green or reddish-brown water and are more or less free-floating. When these organisms decompose they often give off foul odors in water. They are normally found at or near the surface of the water, where there is sufficient light intensity to permit them to grow luxuriously.

3) **Branching Algae** are the most advanced forms of algae. They grow from the lake bottom with stems and branches and have a gritty feel. Chara and Nitella are the principal types of branched algae. Chara has a musky odor and is usually found growing in hard water, in shallow water and on a gravelly bottom. Common names of Chara are **Muskgrass** and **Stonewart**. Chara and Nitella are often mistaken for underwater weeds such as coontail or milfoil. These algae are sometimes difficult to kill even when the proper chemical has been used.

Most aquatic weeds can be classified into: **Floating** plants and **Submersed** plants.

1) **Floating** plants include those that are not attached to anything and freely float on the surface of the water. Duckweed, principally, and watermeal, to a lesser degree, are floating plants which often form a green blanket on the water surface. Duckweed has tiny leaves called fronds with rootlets that hang down in the water. Watermeal appears as tiny green grains or granules floating on the surface of the water. They are commonly found growing together. Wind currents will concentrate duckweed and watermeal in certain portions of a pond or lake.

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(Aquatic Weeds cont'd.)

Duckweed is difficult to kill especially because the tiny leaves have a waxy coating which makes it difficult for the herbicide to penetrate.

2) **Submersed** plants are usually, but not always, rooted to the bottom, and their stems and leaves may fill the water to the surface. These plants are commonly called moss, sea weed or water grass. They include many different species of pondweed such as coontail, milfoil, waterweed, naiad, waterstargrass, etc. Submersed plants have three distinct types of leaf attachments, namely: **whorled, opposite** and **alternate**. **Whorled** leaf attachments are those that have more than two leaves attached at the same point on the main stem. **Opposite** leaf attachments are those that have only two leaves attached at the same point on the main stem. **Alternate** leaf attachments are those that have one leaf attached singly at different heights on the stem. The leaves are in a staggered arrangement and they are never opposite each other. Examples of plants with **whorled** leaf attachments are: Horned Pondweed, Waterstargrass, Southern Naiad.

Plants with alternate leaf attachments having fine leaves include: Leafy Pondweed, Sago Pondweed, and Small Pondweed. Pondweeds with alternate leaf attachments and with broad floating leaves include: Floatingleaf Pondweed.

Problems encountered in obtaining a successful program of algae and aquatic weed control

To obtain satisfactory algae and weed control in any body of water it is essential to know the species and amount of algae and weeds that are present in the body of water. A moderate to heavy infestation of aquatic weeds in a body of water with any algae problem is an important consideration in determining the recommendation to be made for algae treatment, for aquatic weed treatment, or for both. The greater the aquatic weed infestation, the more essential it becomes to treat the water either for both algae and aquatic weeds or to increase the dosage used for algae control. Most of all registered algicides and aquatic herbicides are absorbed equally rapidly by algae and aquatic weeds. Therefore, a chemical added to a body of water which is heavily infested with weeds and algae and is being treeated only for algae, may fail entirely because much of the algicide is being absorbed and detoxified by the aquatic weeds. Other than the kinds of amounts of algae and weeds present, it is essential to know their location in the water and whether the algae and weeds are young and actively growing. All plants and algae are easier to kill in their earlier growing stage than when they are mature. Temperature of water is also important. Treat for algae and weeds in late spring or early summer after water temperatures have reached 62-65 degrees F and before the aquatic plants have gone to seed.

The physical condition of the water is equally important in assuring successful control of algae and plants. Muddy water rapidly deactivates most of the known algicides and aquatic herbicides. Therefore, never treat a pond after a rain when the water may be muddy. The chemicals will be rapidly deactivated and will not perform. Be sure not to stir up the shallow water with oars, paddles, motors, or other equipment.

Time of application especially for algae control is important. The best time of the day to treat for algae is in the middle of the day in a bright sun when the algae are growing rapidly. They are much easier to kill when in an active metabolic state. Postpone the treatment if conditions are not right. For Algae control it is usually necessary to treat more than once a season, followed by periodic spot treatment when new growth appears. Algae are better controlled if the algicide is applied directly on the algae. If a pond has filamentous algae concentrated primarily near the shore or on the bottom in the shallow areas, use the recommended amount of algicide to treat the entire pond but apply it only where the algae are growing. Never add algicide to clear algae free-water. It probably will be wasted.

Finally, if the weed and algae growth are moderate to heavy, don't treat the entire body of water at one time. Treat half of it one week and half a week or ten days later. This will insure that the dead weeds and algae will not rapidly and complete deplete the dissolved oxygen. A great number of fish kills result not from any toxic property of the chemical used but from a lack of oxygen caused by decaying dead algae and weeds.

Algae and aquatic weeds can usually be controlled satisfactorily in most bodies of water. To obtain satisfactory control, however, it is necessary to survey the body of water, to determine the kinds of weeds and algae present, the area, and the flow of water through the pond or lake. On the basis of this and other information a sound and successful treatment of the body of water can be made.

In conclusion:

The beautiful water hazards and scenic ponds located near well fertilized greens and fairways are prime targets for noxious algae growth and aquatic weeds. Lost golf balls in thick surface algae mats or in opaque, green waters represent a financial loss to disgruntled golfers and slows play. Foul odors emitted from decaying, unsightly algae can detract from the beauty of a course and the pleasures of the game. In addition, sprinkler irrigation systems hooked up to these ponds often become clogged and inoperative.

We now know that it is possible and economically feasible chemically to control algae and weeds in most golf course lagoons, lakes, and other waterways without adversely effecting humans, killing fish, or rendering the treated water unsuitable for irrigation purpose. Aquatic weeds and algae need not be tolerated.

Kentucky Bluegrass Lawn Quality

Adelphi, Fylking, Glade, Nugget, Rugby, Sydsport and Touchdown Kentucky bluegrasses have been evaluated by Agronomists R. J. Hull and C. R. Skogley at the University of Rhode Island. Carbon dioxide from the atmosphere is used by these lawngrasses to help promote root growth more than foliar growth. Increases in root development at the expense of leaf production result in higher quality turf that requires less frequent mowing.

Properties of lawngrasses, such as color of foliage, density of lawn cover, leaf blade angle and width, susceptibility to disease, preference by herbivorous insects and ability to recover from mechanical injury, are all recognized as influencing turf quality. Large clipping yields indicating stimulation of foliar growth are not beneficial in the long term maintenance of a high quality lawn. Frequent lawn mowing is also an unpleasant experience for most gardeners.

Thus, lawn care practices that avoid excessive stimulation of Kentucky bluegrasses, such as applications of too much water or fertilizer, increase prospects for a nicer looking more hardy lawn.