

Chemical control can be an effective means of controlling nuisance aquatic vegetation in a pond. Before using any chemical control, the aquatic plant to be treated must be correctly identified so that the most effective and economical herbicide can be chosen. Assistance in aquatic plant identification can be obtained from the Florida Cooperative Extension Service, the Florida Department of Natural Resources, and the Florida Game and Fresh Water Fish Commission. Specific areas within a pond can be kept free of aquatic vegetation or the entire pond can be cleared. If the pond owner wishes to remove all the vegetation from a pond, only a portion of the vegetation should be treated to minimize the chance of having a fish kill as the dying vegetation decays. After the treated vegetation decays, additional vegetation can then be treated. Always read and observe the herbicide label precautions. After herbicide application, the water and fish may be unfit for food or agricultural purposes until a specified period of time has elapsed. This information will be provided on the herbicide label. Although chemical control is effective, it can be expensive. The herbicides may have to be applied several times during the year.

Biological control of aquatic vegetation can be achieved using herbivorous fish such as the white amur, commonly called the "grass carp". The grass carp is almost totally vegetarian after it reaches a length of about four inches. It prefers to eat pondweeds that contain little fiber, but will consume emergent reeds, rushes, and sedges. In the absence of aquatic vegetation, grass carp feed on terrestrial plants overhanging or falling into the water. A free permit is required to possess grass carp in Florida. The permit must be obtained from the Florida Game and Fresh Water Fish Commission. Only sterile triploid fish can be stocked into Florida waters. Recommended stocking rates range from 5 to 25 fish per acre of water. These rates vary depending on the type and quantity of vegetation present. Only eight-inch or larger grass carp should be stocked into ponds with existing bass populations to minimize predation by bass. Grass carp may live more than ten years, making their use a cost-effective means of controlling nuisance aquatic vegetation. For further information, see Florida Experiment Stations Bulletin 867, "Grass Carp, a Fish for Biological Management of Hydrilla and Other Aquatic Weeds in Florida".

### Liming

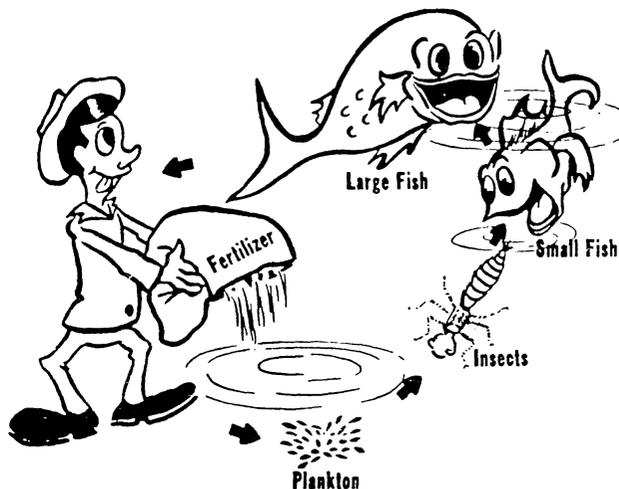
Many Florida ponds are constructed on acid soils. This can cause water to become acid, reducing the efficient use of nutrients, thus decreasing the overall

productivity of a pond. Fish are often stressed in low pH (acid) water, causing them to grow slowly. A pH of 7.0 is considered to be neutral, while a pH of 6.0 to 8.0 is considered desirable for maximum fish production.

An acid water (low pH) situation can easily be overcome by liming. Ponds can be limed just as agricultural fields are limed to increase soil pH. One ton of limestone will raise the pH of a one-acre pond by approximately one pH unit. Only finely ground agricultural limestone should be used. Lime can be applied from a boat over the surface of a pond, or in shallow areas around the perimeter of the pond. Response of the pond water to liming may take four to eight weeks. Frequency of liming varies from pond to pond depending upon the local soil acidity and movement of water into and out of the pond. Your county agricultural extension agent can assist you in determining if and how much lime should be added to your pond.

### Fertilization

Fertilization, the artificial addition of nutrients to a pond, is not a recommended or necessary management practice for most of central and south Florida. Most soils in these areas are naturally rich in phosphate and any ponds built in these soils are naturally rich in nutrients and highly productive. Ponds in the Florida Panhandle may benefit from fertilization.



Fertilization can be an effective means of controlling submergent aquatic vegetation. If begun early enough in the year, the addition of nutrients to a pond will promote the growth of microscopic plants. Their dense populations will shade the rooted plants, preventing them from growing. Increased risks of