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College of Agricultural Sciences • Cooperative Extension

# The Quarter Ponder

A Quarterly Newsletter Devoted to Pond Ecology and Management Information

Montgomery County 1015 Bridge Road, Suite H, Collegeville, PA 19426-1179 (610) 489-4315

October 1999

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## Upcoming Meetings

An aquatic weed management night will be held on February 24, 2000 at the 4-H center in Creamery, PA. This is an educational session for people interested in managing wetland or aquatic weeds. Pesticide credits will be given out for people bringing their pesticide applicator licenses.

## Eurasian Water Milfoil

Eurasian water milfoil (Myriophyllum spicatum ) is a submersed aquatic plant which originated in northern Europe and Asia. In North America it is considered a highly invasive plant.

Eurasian watermilfoil is a nasty weed in Pennsylvania lakes and ponds.

Once it enters a pond it can spread rapidly from seeds and stem fragments. It has a high growth rate in a range of temperatures and environmental conditions, and can reach the surface ponds and form extensive mats, which can shade and out native vegetation.

Eurasian water milfoil is found in water from one to 4 yards deep, and grows in fine sediments on the bottom of ponds. Eurasian water milfoil has long stringy stems with feather-like leaves. Individual leaves are arranged in whorls around the stem. Leaves are made up of about 12 to 20 fine leaflets and create a fish bone pattern. White flowers are at the tips of plants and often stick out of the water (see drawing on next page).

The best way to avoid the spread of these non-native plants is to find them before they become well established in a body of water. Once introduced, these plants spread quickly, and after becoming established, eradication is extremely difficult and expensive. Plus, the use of herbicides may cause additional environmental problems. Other techniques include the use of sterile (triploid) grass carp and aquatic insects. The use of introduced aquatic insects species to control milfoil (biocontrol) is showing some promise.

Milfoil control options include hand-pulling, suction harvesting, mechanical harvesting and herbicide application. Hand pulling is the best option for controlling small stands of milfoil. However, care must be taken to remove the

entire plant, including roots, and to avoid spreading plant fragments. More disruptive approaches such as dredging or rotavation can eliminate all plants, reducing habitat for fish and food for waterfowl and potentially destabilize sediments, resulting in murky water.

Chemical controls of Eurasian watermilfoil can be effective, however, long term eradication of larger infestations is unlikely and chemical controls can be expensive and may

Image: http://aquat1.ifas.ufl.edu/myrspi2.jpg

need to be repeated every one to four years. Generally, the aim is for selective control, to reduce Eurasian watermilfoil, but retain a native plant community. Thus, systemic herbicides, which are taken up by the plant and will kill the entire plant, are preferable to contact herbicides which will knock down the plant, but do not affect the roots and prevent regrowth. Control is most effective with spring or fall applications and some damage to other broad-leaved plants can be expected.

In Pennsylvania a permit from the Pennsylvania Fish and Boat Commission is required to apply herbicides or vegetation control products in any impoundment. Applications for permits are available form the commission or your local Penn State Cooperative Extension office.

The use of sterile (triploid) grass carp has shown limited effectiveness in the control of Eurasian water milfoil. Although grass carp prefer submersed vegetation similar to Eurasian milfoil studies have shown that Eurasian milfoil is one of the least preferred foods of grass carp. Therefore, they tend to eat everything else first. In addition, grass carp may cause additional environmental problems, including the total elimination of all aquatic plants and resuspension of bottom sediments.

A second biological control agent is the subject of much research. The milfoil weevil (Euhrychiopsis lecontei) is a potential candidate for use as a biological control agent on Eurasian water milfoil. It feeds and develops only on the milfoil species. The use of the milfoil weevil in lakes and ponds is currently not available as a control agent. Research is trying to identify the conditions in which the insect is most effective. If future research proves the insect a viable control agent it is possible that it will become available for use in lakes ponds.

This text was adapted from the following aquatic plant identification guide put out by the Wisconsin Lakes Partnership entitled: Through the Looking Glass and can be purchased through the University of Wisconsin Extension, and two web sites:
http://aquat1.ifas.ufl.edu/myaqpic.html
http://www.paulsmiths.edu/aai/milfoil.html

## Water Level Drawdown to Reduce Macrophytes

This Fall you may want to consider drawing down the water in your pond to expose sediments and plants to the freezing conditions of winter (This, of course, would have been easier had not hurricane Floyd arrived and filled our shallow drought stressed ponds).

One of the most useful and most inexpensive pond management practices is called a "winter drawdown." This practice is the reduction of water levels in a pond to some predetermined level, and generally is designed to expose 35 to 50 percent of the pond-bottom area. Winter drawdowns can be useful in controlling aquatic weeds, and can be invaluable in manipulating fish populations and facilitating pond repairs, redesign, and liming. The primary disadvantage is that the pond must have a drain pipe that will allow the water levels to be lowered and kept down throughout the winter. Ponds without a drain pipe can be retro-fitted, and detailed information on how this is accomplished is available through your county Natural Resource Conservation Service office.

Aquatic weed problems are common in farm ponds, and usually represent a challenge to overcome. Of the three basic weed control methods (mechanical, biological, and chemical), mechanical control can be the least expensive and most convenient, if it consists of a winter drawdown. Winter drawdown exposes weeds to air-drying and freezing temperatures. This can be an effective weed control technique, especially if done in successive years, and it has other advantages related to fish population management.

For effective weed control, drop the water level of the pond to expose aquatic weeds in the more shallow portions of the pond. Usually, water levels are reduced enough to expose 35 to 50 percent of the pond bottom, but this percentage may vary greatly, depending upon topography and design of the pond. Maximum drawdown should be accomplished by mid- to late November, and the water level should remain low through February. Spring rains will fill the pond.

After reflooding, if weeds persist and begin to sprout, apply an appropriate herbicide. The combination of a winter drawdown and effective early spring herbicide application usually does a good job of eliminating or greatly reducing aquatic weed infestations.

Winter drawdown is also a good fish population management technique in bass/bluegill ponds. By reducing the water level and pond area, forage fish, such as bluegills, are driven out of shallow water refuges and concentrated in open water, making them more vulnerable to bass predation. This is a good technique to use in ponds classed as "crowded bluegill," but still have viable bass populations in them. The increased predation by bass reduces bluegill numbers and provides additional food for the struggling bass population. In some cases, routine annual drawdowns have helped the pond manager maintain a balanced bass/bluegill fishery.

Winter drawdown also provides a good opportunity to do repairs on piers, docks, and boat ramps, as well as minor dam repairs and shoreline renovation. Fish attractors, such as brush tops and gravel beds, can be easily put in place while the water is down, and this is a good time to deepen edges to the recommended minimum depth of 18 to 24 inches. Dirt from the shoreline-deepening operation can be used to construct earthen piers at various locations around the pond. These piers serve to increase the shoreline area of the pond, and also provide increased access for fishermen.

In most farm ponds, lowering the water level 2 to 3 feet exposes the proper percentage of the pond bottom; however, this is only a rule of thumb. You must consider the topography of the pond, amount of shallow water, and pond shape and design. As recommended for weed control, reach the maximum depth of drawdown by late November, and the

water must remain down through February for the technique to be effective.

Winter drawdown can be a useful tool for the farm pond manager if executed properly. It poses no threat to the fish population, and costs nothing if the pond is equipped with a water control structure. Drawdowns should only be done in the winter, however; never during summer! The extreme temperatures during summer, coupled with the increased metabolism of fish and reduced oxygen levels in warm water, would prove disastrous in most farm pond situations.

Drawing down a pond larger than one acre requires a permit from the fish and boat commission or the Pennsylvania Department of Environmental Protection. Contact these offices for more information.

By Dr. Martin Brunson, Extension Leader and Fisheries Specialist, Department of Wildlife and Fisheries, and Dr. Chuck Weirich Mississippi State Cooperative Extension.

## CDC Warns Encephalitis Virus May Spread south with Migrating Birds

The Centers for Disease Control and Prevention identified a West Nile-like encephalitis virus as the cause of several deaths in New York City and warned that the virus may spread south.

More than 500 birds have been found to be infected with the West Nile-like virus in the New York City area, according to government and press reports. The city of New York has been sprayed at least twice with the pesticide malathion. Infected birds also have been found in Connecticut, New Jersey and Long Island. New Jersey officials started spraying the state Sept. 29.

CDC officials warned that the virus may spread south with infected birds as they migrate for the winter. The Atlanta-based agency said that 37 people in New York have tested positive for the West Nile virus. Originally CDC believed that the St. Louis encephalitis virus was responsible for the outbreak, but a West Nile-like virus was identified as the cause on Sept. 24.

West Nile virus is an arbovirus (mosquito-borne) that is closely related to the St. Louis encephalitis virus, but generally has milder symptoms in humans. Both viruses are transmitted through the bite of a mosquito which has been infected by feeding on an infected bird. West Nile virus has never before been recognized in the United States or any other area of the Western Hemisphere.

Malathion spraying and other mosquito control efforts used to combat St. Louis encephalitis are also effective against the West Nile-like virus, federal officials said.

Reference: Pesticide & Toxic Chemical News, September 30, 1999, page 8.

## Mosquito Control

Recent news has linked the West Nile-Like virus found in birds in New York City with the human encephalitis outbreak in the NY City area. The virus is transmitted to humans after mosquitoes become infected with he virus after feeding on an infected bird. West Nile virus can not be transmitted from bird to person or from person to person.

This recent news may have many of you wondering about mosquito control in your ponds. Although the West Nile-Like virus has not been reported in PA it is advisable to take precautions when venturing outside. In particular it is advisable to wear long sleeves and long pants, avoid outdoor activities at dawn and dusk, and use insect repellent on clothes.

In your pond you can control mosquito larvae by:

1) Stocking ponds and reservoirs with mosquito-eating fish such as green sunfish, bluegills, guppies or any surface-feeding minnow. The mosquitofish, Gambusia

affinis, is the most commonly used fish for mosquito control in the world. Also, predatory mosquitoes, Toxorhynchites spp, and mermithid nematodes have been used on an operational basis as biocontrol agents.

2) Maintaining farm ponds according to good management practices. Excessive amounts of emergent aquatic vegetation will shelter mosquitoes. In some cases, fish, such as the White Amur or Grass Carp, can be used to clear vegetation and reduce the mosquito breeding capacity of the pond. Stagnant ponds, which are highly septic, and waste lagoons can also produce large numbers of mosquitoes.

## Reducing Phosphorus in Ponds

Phosphorus is one of the many elements found on the periodic table. It is widely used in agriculture as a fertilizer and is very important in stimulating plant growth and improving crop yields and grass growth. It is naturally present in soils, rocks and bones. The movement of phosphorus from soils through erosion and runoff into ponds will stimulate algal growth, and can lead to eutrophication of ponds. In this process, algae multiply rapidly. These algae, which cloud the water or make dense mats of scum, shade submerged aquatic vegetation and prevent them from getting the light they need to grow. The submerged plants will dieback reducing available habitat of aquatic animals. When the algae themselves die they decompose. During decomposition dissolved oxygen is removed from the water. Lowered oxygen levels make it difficult for other aquatic organisms to survive.

Phosphorus, attached to sediments derived from soil erosion, may accumulate in the pond sediments. This phosphorus may be recycled slowly or released more rapidly when these sediments are disturbed, for example during a storm or flood. Pollution from phosphorus is therefore a long-term problem.

Phosphorus from land uses surrounding many ponds may represent half or more of the load regenerated from the sediments. The addition of run off phosphates combined with the stirring up of bottom sediments and phosphorus can create a heavy phosphorus load. Since phosphorus regeneration plays such a central role in determining water quality, efforts to limit regeneration should be the focus of in-pond water quality efforts.

Phosphorus in a pond can come from land uses within surrounding the pond over a number of years. Options to reduce phosphorus loadings include:

1. properly designed and sited septic systems,
2. Vegetated buffer strips around ponds,
3. Fertilizer phosphorus reductions or elimination in the lawn,
4. treatment of direct or nearshore runoff with selected wetland plants or sediment check dams.

Since the reduction of phosphorus loadings to ponds is such and important part of pond water quality, future discussions and articles related to phosphorus reduction will appear in this newsletter.

Look for the next issue in early January.

Lou Saporito
Extension Agent