



Pond Home Study Course

Lesson 2 Pond Maintenance

Frequently Asked Questions

How can I fix a leaking pond?

Leaking ponds usually must be drained and a sealer (clay, bentonite, plastic) must be applied to the leaking area.

What kinds of water quality problems can occur in ponds?

The water quality concerns for a pond will depend on the use. Temperature and dissolved oxygen are most important for fish. Bacteria levels are the biggest concern for livestock or swimming. Hardness levels are important if you are applying an aquatic herbicide

What causes a pond to look muddy?

Muddy ponds can come from many sources. Bottom feeding fish (catfish, carp), muskrats, wave action, waterfowl and livestock can all muddy a pond. Sometimes, excessive growth of small plankton may make the water look muddy. You can determine the cause of muddy water by filling a glass jar with pond water and holding it to a strong light. Plankton can be observed moving erratically. Sediment will usually settle to the bottom of the jar in a day or so.

Should I use a garden rake to clean out the leaf build up on the bottom of the pond? Should I be concerned about damaging the base or banks of the pond?

We don't think you will be damaging the pond bottom by raking to remove the leaves. Try not to dig into the bottom and just scrape up the leaves. This should not be a problem and will reduce the nutrient levels in your pond. Raking the bottom is fine as long as it is done carefully to keep from digging into the clay liner that keeps the pond from leaking. Also, raking will disturb lots of sediment and will cause the pond to be muddy or turbid for a while. We would only suggest raking if the pond is receiving an awful lot of leaves each year. If so, then raking could have a long term benefit to reduce the muck layer.

How readily available are pond sealing materials and is this something a landowner can do themselves?

Pond sealing material is available to the public to purchase. However most pond leaks require the pond to be drained to be fixed and if this is the case then a contractor is brought in to apply material to fix the leak correctly and evaluate the structures soundness. Often, the pond must be lined with a new layer of clay to fix any leaks that are occurring.

Does the pH of a pond normally vary between day and night?

The pH of a pond will usually vary over 24 hours. It will be lowest at dawn and increase during the day as plants consume carbon dioxide from the water during photosynthesis. At night, the plants release carbon dioxide during respiration causing pH to decrease (keep in mind that carbon dioxide in water dissociates into carbonic acid which causes the pH change). The pH change in most ponds is small but depends on the amount of alkalinity that is available to resist pH changes. In acidic, soft ponds with low alkalinity, the pH change can be substantial due to aquatic plants.

Do landowners often over lime their ponds, or lime when it is not necessary?

It is more likely that pond owners are neither testing their pond water pH nor making a lime application verses over applying lime to a pond, but it does happen. Over application mistakes are also made by not accurately calculating the pond size and volume measurements. However, it is difficult to over-apply lime to most ponds. All of the lime will eventually dissolve and increase the pond pH.

Is it true that liming a pond can help settle out silt?

An addition of real fine ag limestone will help settle out the silt. You should first determine if you actually have silt. You can fill a jar with your pond water and let it sit for a few days. Silt particles will settle to the bottom whereas plankton and algae will remain suspended as cloudy green flecks or tiny moving organisms.

If it is silt, you need to determine the source of the silt and eliminate it from getting into the pond water. A good riparian buffer around your pond will help with this effort if the silt is in the source water. It may also be from bottom feeding fish or geese activity.

The following information comes from a new multi state extension Pond Owners Handbook:

Several substances can hasten the settling of silt particles, including ag lime (1000 pounds per surface acre), aluminum sulfate, also called alum (150-250 pounds per surface acre), or ag gypsum (300-500 pounds per surface acre) DO NOT use quicklime (calcium oxide). Test the pH of the water before and after application and monitor any changes due to the application.

Gypsum and aluminum sulfate may increase the acidity of the pond water, rendering the pond less suitable or even lethal for fish. To reduce these risks apply one quarter of the recommended amounts at a time. Wait a few days and assess the affect. Make the most of the application by mixing the substance with clear water to form a slurry, which can then be sprayed and mixed evenly across the surface of the pond. Water used for livestock should not be treated with these substances.

Do the enzyme products sold on the market really work at removing nutrients and devouring bottom sludge?

There are two different issues with the enzymes. Some are marketed for sludge reduction while others are for nutrient control. Our early experience with bacteria/enzyme products is promising for nutrient control and reduced algae and plant growth, but there are some considerations when using these products. They can be very expensive and must be applied at least once per year because of our cold climate.

What is a dry hydrant?

A dry hydrant is a device that allows fire trucks to quickly hook up and withdraw water from you pond to fight a rural fire.

I plan to use 500 feet of pneumatic tubing with small holes drilled in it to aerate my pond. I would use bricks to hold it on the bottom. It will circle the pond and run through the deepest areas. I will connect it to an air compressor and run 30 pounds of air pressure. What do you think?

The aeration makes sense, but not the method you are planning. Drilling holes in tubing will result in uneven distribution due to big air holes. Most of the air pumped in will be lost in the first few holes. Pre-made aerating tubing has very small (needle size or smaller) holes. Putting the tubing around the pond is not a good idea. Instead you should use a couple of diffusers in two places at the bottom of the pond, that create a flow of water and mixing, and this movement will create even more dissolved oxygen then the air pumping.

Would reducing the 12 inches of silt on the bottom of the pond reduce filamentous algae compared to chemical approaches?

Dredging a pond is an expensive process and will remove nutrients from the pond. However, if you are not controlling the nutrients entering your pond in the source water by implementing good riparian buffers, your algae problems will return even if you dredge. Many people are using continuous aeration to keep the nutrients out of suspension, but this takes a lot of energy and expense as well. Dredging will have an effect, but it's costly,

time consuming, damaging to the pond eco system, and the effect is short-lived with paying attention to nutrient sources.

There is green vegetation growing on the rocks in the stream that feed the pond. Looks like algae and something that looks like watercress. Should I be concerned with this? Remove it? Will it eventually overtake the stream?

The green vegetation growing on the rocks should be of no concern. It will not take over the stream. Watercress cannot be effectively treated with a herbicide because it almost always occurs in flowing springs or streams with limited contact time. It is usually not a concern – it will grow abundantly, but it's usually not a big deal. You will be stuck with mechanical removal, if you want to be rid of it.

Is it safe to spray poison ivy along the stream that feeds a pond?

Poison ivy is hard to control and can be poisonous year round. One product to use would be glyphosphate (Roundup). You may have to make several applications over several years. It is a systemic herbicide that needs an actively growing plant to work. You would not want to cut the ivy and then apply. Rather apply the glyphosphate to new growing leaves. The leaves will take the herbicide throughout the plant, killing roots and all. We protect the stream by not over applying and don't apply before a rain event. Read and follow the label directions. You can safely use the glyphosphate on the poison ivy without worrying about affecting the pond. Where trade names are mentioned no endorsement is implied.

What is the best way to oxygenate the pond?

We need to know the dissolved oxygen level of the pond to see if we even need to aerate. Oxygen exchange is the exchange of oxygen from the atmosphere to the dissolved oxygen in the water. So we are talking about the surface water of the pond. The rougher the water surface, the more rapid the exchange. Also, the more deficient the oxygen content of the water, the faster the exchange occurs.

When we talk about diffusers, we are talking about under the water. Efficiency of oxygen transfer is related to the size of the air bubbles released and water depth. The smaller the bubble and the deeper it is released, the more efficient this type of aerator becomes. One of the biggest problems with diffused-air systems is clogging of the air lines and diffusers.

It would be good to think of a way to aerate without the use of energy. Can the water drop from the spring as it enters the pond or can we create a paddle wheel operated by spring flow where the spring enters?

Photosynthesis is also a very effective aeration system during daylight hours, if we have adequate vegetation.

Can aeration devices be purchased at a reasonable cost using no electricity?

Solar and wind powered generators are on the market. Solar and wind powered aeration is rarely going to be good enough to help the pond. Even solar powered aeration can be pricey (>\$1,000). If the pond is very shallow (less than 3 feet), you could give solar a try if the pond is in an open site with maximum sunlight.

How much is too much silt and at what point do you clean it out?

Dredging a pond is expensive so you try to go as long as possible, but when the silt buildup starts interfering with pond uses, then it is time to dredge. A pond is always working toward filling in and we want to slow this process as much as we can. Basically, when you start to get a lot of the pond area in less than 3 feet of water, it is probably time to dredge because you will start to get more abundant plant growth.

Do the pond bacteria being sold today really help breakdown the muck layer?

Use of bacteria to breakdown muck layers is overblown. It will help a little bit, but it is slow. The benefit would depend on how much of the muck is organic (leaves, etc.) versus sediment. Bacteria can act to reduce organic muck, but they can't breakdown mineral sediment particles. Overall, you should not expect more than a few inches of reduction in muck from bacteria products. It is not reasonable to look at these products as a way to avoid dredging.

Source: Penn State Cooperative Extension Pond Management Website and PA Fish and Boat Commission Pond Website

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