

**GOLF COURSE PONDS  
THE GOOD, THE BAD AND THE UGLY:  
MAKING USE OF THE GOOD IN PONDS  
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There may be few natural resources from which so much is expected than the golf course pond. And yet, golf course ponds are often inherently unable to meet these expectations or the resources are not available to initiate effective management strategies that may help the pond to approximate these expectations. Lake managers have focused on the nutrient status of surface water resources for 30 years and often characterize pond systems, like golf course ponds, as “nutrient stews” that will grow an overwhelmingly large amounts of noxious vegetation. Turf fertilizers are often singled out as the cause of problems in pond ecosystems. This provides little encouragement for those persons faced with the daunting task of “golf course pond improvement”. Unfortunately, “too many nutrients approach” is too simplistic for golf course ponds and can lead to the development of unrealistic expectations and failed management attempts. Too often, golf course superintendents will simply abandon any efforts to improve their surface water resources because of the perception that “nothing can be done” to really improve the resource. Expectations can be made more realistic and management success may be more easily achieved if managers adopt a different outlook and approach to the management of golf course ponds.

Golf course pond managers need to approach these resources as though they are disturbed ecosystems, because more often than not, that is exactly what they are. They are analogous to an area of the golf course where the soils have been rototilled and then left to support whatever vegetation might “show up” to inhabit the site. Many golf course ponds are nutrient enriched by fertilizers used for turf management, but some are not enriched to a problematic degree, but may be merely inhabited by the wrong kinds of plants (weeds). Golf course pond managers will do well to not only manage the total amount of plant production in their systems, but must also manage the type of vegetation found in the system. This approach will help to establish realistic expectations for the resource, provide focus for the management program, reduce management cost and effort, and help to establish the pond as a landscape asset rather than a merely a liability.

Aquatic plants are a lot like terrestrial plants. There are good plants and bad plants. The bad plants are those that poses characteristics that are inconsistent with our aesthetic sensibilities or utilitarian demands - they look bad and get in the way. Good aquatic plants may not be considered with the same “affection” or “respect” as terrestrial plants, but they may be considered “good” because they “don’t look as bad” or do not interfere with irrigation conveyances or other utilitarian demands. Golf course ponds are not swimming pools and most golf course superintendent budgets couldn’t bear the management costs if they were swimming pools. The technologies do not exist that would eliminate all plant and algae growth from golf course pond ecosystems. Therefore, the golf course pond manager must decide what plants will be allowed to grow in the pond, and which plants will be controlled. Again, this is exactly the same thing that is done in the development of terrestrial landscape plans. The landscape architect will select plants for different parts of the landscape according to use patterns and other aesthetic and utilitarian considerations.

### **The Bad Plants**

Most people know about the “Bad Plants”. There are a number of plants that are commonly problematic in golf course ponds. The plants have different characteristics and present different management challenges.

## Algae

### Suspended Algae or Phytoplankton:

There are different kinds of algae. The suspended algae are known as the phytoplankton and are the unicellular or microscopic aggregations or colonies of algae cells that impart a green hue to the water. They can also be responsible for odor problems, imparting a “musty” odor to afflicted waters and irrigation water. The production of these plants that is directly related to the amount of nutrients that may be entering the golf course pond. Generally, the more phosphorus that enters the system, the more algae you get. In fact some estimates suggest that 1 pound of phosphorus may support the production of 1,000 pounds of algae. The phytoplankton are not inherently bad however. They support fisheries production and other aquatic animal production. Problem algae blooms may be the result of “nutrient pollution” but they may also result from “unbalanced fisheries” or the limitation of nitrogen or carbon, relative to the amount of phosphorus that is available. These algae can be managed with algaecides that can be used without irrigation restrictions, however, they can also be managed by effective fisheries management, aeration, and nutrient deactivation strategies. Recently, a kind of algae known as the blue green algae (these are actually a photosynthetic bacteria) have received attention because of the highly toxic substances that they are able to synthesize and release into the water. Continuing studies of these toxins and the blue green algae provides ample incentive for golf course pond managers to do whatever they can to prevent these algae from dominating their surface water resources.

*Table 1. Common problem suspended algae.*

Common Name	Type of Algae
Anabaena	Blue Green
Aphanizomenon	Blue Green
Microcystis	Blue Green

### Filamentous Algae:

The filamentous algae are commonly problematic in golf course ponds. They form the thick, hairy, unsightly mats of occasionally malodorous vegetation, that are considered to be repugnant by golfers and are the bane of irrigation systems. The filamentous algae are macroscopic and can easily clog irrigation intakes, sprinkler heads, and even pipes and pumps. Many of the filamentous algae are easily controlled with algaecides; however, there are a growing number of ponds that are becoming infested with filamentous algae that are resistant to common algaecides. Imprudent use of algaecides should be avoided to prevent the “algaecide” resistant algae from dominating plant production in the pond. It is absolutely critical that “good plants” be allowed to proliferate in golf course ponds as competition to these noxious forms of algae.

*Table 2. Common problem filamentous algae.*

Common Name	Control Effort
Cladophora	Moderately Difficult to Control
Rhizoclonium	Moderately Difficult to Control
Pithophora	Moderately to Very Difficult to Control
Spirogyra	Easy to Control
Water Net	Very Difficult to Control

### Gelatinous Algae:

Gelatinous algae are macroscopic colonies of blue green algae that form dark or black scums that look like floating sewage. They are malodorous, and like the problem filamentous algae, often show up in golf course ponds where algaecides have been used imprudently (or excessively). These kinds of algae are almost impossible to control.

Table 3. *Problem gelatinous algae species.*

Common Name	Control Effort
Oscillatoria	Nearly Impossible
Lyngbya	Nearly Impossible

#### Macroscopic Algae:

The macroscopic algae, chara, looks like a higher plant but is really an algae. Chara is usually considered to be a “good plant” because it can form a low-growing meadow of vegetation that competes effectively with less desirable plants and algae. Sometimes, however, chara will grow to nuisance levels in golf course ponds. The best management strategy is to “cut it down” with algaecides rather than killing it off, because it makes a “good aquatic ground cover”. If this is not possible, it is possible to control chara with conventional algaecides.

#### **Mosses**

There are several mosses that become problematic in golf course ponds. They are not easily controlled and it is best that a good aquatic ground cover of desirable plants be maintained to prevent the mosses from becoming a problem. They can, in some systems, be a “good neighbor” so it is not wise to panic when they are first detected.

Table 4. *Common problem aquatic mosses.*

Common Name	Control Effort
Drepanocladus	Very Difficult to Control

#### **Ferns**

There are no problematic ferns currently found in Michigan waters, but they do seem to be headed our way from the south. Most of the problem ferns are free floating, rosette-like plants that resemble the duckweeds. Let’s hope these never really get a foot hold in Michigan golf course ponds because they are very difficult to control.

#### **Higher Plants**

The most problematic of the higher plants are those species that are particularly well adapted to growth in disturbed ecosystems. Like the dandelion and crab grass, we don’t usually appreciate the aesthetic character of these kinds of plants.

#### Duckweeds:

There are three or four duckweed species that can become a problem in golf course ponds. These small plants can make a golf course pond look more green and densely covered by vegetation than the putting greens. These plants eliminate the “competition” by completely dominating the surface of the water. Allowed to cover the entire surface of the pond, the water below duckweed can become anoxic and very malodorous. Unwitting golfers may mistake the pond surface for terra firma and attempt to walk on water. These plants can be a liability concern! Unfortunately, the best control strategies involve irrigation restrictions.

Table 5. *Common problem floating plants.*

Common Name	Control Effort
Common Duckweed	Moderately Difficult to Control
Water Meal	Very Difficult to Control
Star Duckweed	Moderately Difficult to Control
Giant Duckweed	Moderately Difficult to Control

### Bottom Dwelling Rooted Plants:

The rooted plants obtain their nutrition from the bottom of the pond. You can cease to fertilize, even fill the pond with distilled water and these plants will just “keep on going” as long as they have access to the sediments. The best you can do here is to select the kinds of plants you can live with and control the others. Because these are higher plants, some of the herbicide control strategies can create problems with irrigation restrictions; however, the herbicides provide the best means of “tailoring the plant community” to meet expectations. There are also a number of mechanical controls available for the control of rooted aquatic weeds.

*Table 6. Common problem higher bottom rooted, aquatic plants.*

Common Name	Native/Exotic
Sago Pondweed	Michigan Native
Coontail	Michigan Native
Elodea	Michigan Native
Naiads	Several Species, Michigan Native
Curly Leaf Pondweed	Exotic from Eurasia
Eurasian Watermilfoil	Exotic from Eurasia and North Africa

Some of the rooted plants grow submersed in the water while others, like the cattails grow around the edge of the pond. The edge plants can help to stabilize shorelines, but they can also “move out” into shallow water and greatly diminish the amount of “open water” found in a pond. These special kinds of plants can be controlled with herbicides, but they may also be controlled with mechanical techniques.

### **The Good Plants**

There may be few golf course pond managers that can imagine a “good aquatic plant” however, if good plants aren’t recognized, the task of managing the golf course pond can be made extremely difficult, if not just plain impossible. Like most terrestrial ecosystems, something is going to grow there. The best we can do is make certain that the plants that do inhabit the golf course pond are the best ones suited to the position of the pond and the uses made of its water.

### **Good Algae**

#### Phytoplankton:

A green pond, one dominated by some of the desirable forms of phytoplankton, can prevent nuisance rooted plants from being a problem by limiting the amount of light available for their production. A green pond is “not all bad”. The water may not be clear, but it may not be filled with nuisance rooted plants. A pond filled with blue green algae is another story, however. The prudent use of algacides and aeration techniques can help to minimize the level of effort that may be required to manage problem algae species and promote the production of those algae that are “on your side”.

#### Filamentous and Gelatinous Algae Species:

From the golf course pond managers perspective, there are probably no “good” filamentous or gelatinous algae species. If these are present in your pond, you have a bad problem, but every attempt should be made to effectively manage these unsightly species.

### **Higher Plants and Chara**

#### Ground cover species.

Underwater ground cover species can be used just like their terrestrial analogs. Depending on the pond, chara, mosses, and some higher aquatic plants can be used to “cover the pond bottom” and prevent the growth of weed species. This is usually done through the careful use of aquatic herbicides. The plants may not be beautiful, but they prevent other problem weeds from becoming a problem. Unfortunately, those species that have the best characteristics are also not very “disturbance tolerant”. Consequently, they will need some help with careful ecosystem management.

### Ornamental Species:

Sometimes the problems in golf course ponds are so great, the best management approach may be to create an illusion. Some of the highly ornamental aquatic plants and water lilies can be used to distract the viewer from other problems by filling golf course ponds with bloom and lush and attractive vegetation. This is called water gardening and can make some golf course ponds more of an asset than anyone ever imagined. These kinds of ponds and pond management strategies can be particularly effective for ponds located near club houses and parking lots.

#### The Good, the Bad, the Ugly

The golf course pond manager must learn to work with what good is available in the pond and manage against the species that cause the most problems. It is impossible to eliminate all pond growth, but the proper management of plant communities, fisheries, and habitat alterations can be used to make certain that the resource is dominated with the “good plants”. This management approach will reduce the cost and frustration that can often be associated with the management of golf course ponds.