

Algae is the top problem when it comes to ponds, since everything pours into it, from soil to fertilizers to animal waste. So, where do superintendents begin? Should you go *au naturel* or use chemicals, or use a combination of both? These are the key questions superintendents must first answer. Some superintendents get away without having to worry about pond issues, since there aren't any on their courses. But ponds are a pleasing aesthetic addition to any golf course, as well as a breeding ground for insects, algae and a host of other bacteria. It's important to leave money in the budget for their maintenance. Depending on how many ponds you have, approximately \$10,000 annually is a good, average estimate to maintain your ponds. Some superintendents keep the job in-house while others outsource this dirty work to someone like Hertzman. The avid golfer started AMA Sales several years back after noticing the globs of algae in the ponds at courses he frequently played and how unattractive it looked. Hertzman's client list has grown each year



Before treatment and after shots. Some supers treat their water features in-house, while others enlist the services of an outside company.

to the point where today AMA Sales services nearly 40 courses in southern Ontario, including Hamilton Golf & Country Club, which is set to host the PGA TOUR's Canadian Open later this summer. AMA Sales specializes in the elimination of algae and duckweed to improve the overall look of a golf course. Hertzman has developed his own, unique product that he says is environmentally safe and effective. Currently, he's in the process of getting a patent for it. Like most maintenance

and management practices, Hertzman takes a strategic approach to pond management – each course is different and each pond is different, so there is no umbrella solution.

Hertzman uses three ways to treat ponds. First, it's about balancing the water. "You need to have balanced water, which means pH," he explains. "That's our scale of measurement and it needs to be balanced properly. If your ponds have a high pH level, you have a low level of oxygen and if you have low pH

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levels, your water will be more acidic.”

According to Hertzman, algae starts appearing when the pH levels creep up to 8.0 or 9.0 – that’s when you need to balance the water to where it should be by cleaning out the pond. Hertzman recently partnered with a colleague, which gives him access to two boats, equipped with algae-cutting grills to rebalance the pH levels in the water.

“That gives you instant, visual, positive results,” he says. “We clean it out, get rid of bulrushes and cut down the algae all the way to the bottom. After it’s cleaned out, you can see all that came out of pond.”

Once the dirt settles, Hertzman has a better view of what’s going on. At this point that he treats the pond with his chemical product. The final piece is to get more oxygen in the



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ponds, which is achieved by adding aerators. Hertzman says there are so many of these devices on the market now that some research should be done to find the correct aerator for the ponds in your course.

Ken Magnum, superintendent at The Atlanta Athletic Club, has 13 ponds on his property. As the home club of one of the most revered golfers in the history of the sport (Bobby Jones) and host of many major championships (last year’s PGA Championship being the latest), it’s crucial that these bodies of water look good on TV. All of them are in play in some form or fashion. Most have rock walls around the in-play areas, then use iris around edges to keep edges from showing because water levels fluctuate – these provide color and filter from anything running into the ponds. Members use the ponds to fish, so it’s important to be careful about what chemicals he puts into the water. Algae is Magnum’s biggest problem. He puts dye in the lakes to keep them dark and looking good for major championships, but he knows that this is only a short-term solution. Longer term, he says aerators have made the biggest impact.

“One of the best things we’ve done is added aeration and oxygen diffusers,” he says. “This cuts down significantly on the amount of chemicals we need to add to keep algae down. It’s amazing to see how much better the aerators make our ponds. Last year, we added aerators in three more lakes and it has taken what used to be a real problem lake and made it an occasional treatment lake.”

When chemicals are necessary, copper sulphate is the product of choice at the Atlantic Athletic Club, who hires a lake management company that performs these treatments once per month or more as needed.





At Atlanta Athletic Club, the addition of aerators have made the biggest impact on controlling algae and aquatic weeds.

Mangum has six lakes with aerators installed and he hopes to add an additional three or four this year if the budget permits. Aerators are also beneficial to the fish population in the club's lakes since they circulate more oxygen.

"Some of the ones that don't have aerators have fish that die of oxygen depletion," he

reveals. "We have a lot of people that fish, so keeping up the fish population is important."

Robert Ackermann is new to the whole pond debate. The bodies of water at his course (Weston Golf & Country Club), in Toronto's west-end, are only three years old. The superintendent says, so far, he prefers to go *au naturel* – that is, when it comes to managing his ponds.

"My experience with ponds and keeping them clean is all natural," he says. "We use 15 hp pond aerators. One is placed in each of our two main ponds. This constant aeration, plus a three-meter depth, seems to work well."

In terms of other natural solutions, Ackermann hasn't stocked the ponds with any fish yet, but will look to add some this season. "Believe it or not there are already many that

have found their way in," he says.

At the end of the day, Hertzman says it pays to hire a specialist like him who offers a pond management service that begins opening day and lasts for the whole season, continuously inspecting and maintaining the ponds as needed.

"I am specifically in the pond treatment business," he says. "I don't sell anything else, so as soon as a club hires me, I take responsibility for their pond problems. There is no question that a disgusting pond is a station for feeding every mosquito and bug there is, so in my option, there is no room for algae on golf courses." **GCI**

*David McPherson is a Toronto-based freelance golf writer and regular GCI contributor.*



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BY DARIN S. BEVARD



Diffusion aerators (subsurface bubblers) efficiently mix the water column and prevent stratification without the potential visual or noise distraction of a vertical water display.

## Selecting an aerator to enhance water circulation

The proper type of water aeration can improve circulation and help lake quality, but it is far from a cure-all for ugly water features.

**W**ater features are an important part of architecture on many golf courses. Well-placed lakes and ponds add to the strategy of golf and provide penalties for errant shots. More importantly, water features collect drainage water from golf course property and surrounding areas. Often, this water is the primary irrigation source on the golf course. Water features are an important aesthetic, environmental and practical feature on golf courses. However, they can become an eyesore if algae blooms and other aquatic weeds transform them into a green mess. When this occurs, golfers become irritated and the perception of the golf course (and the superintendent, in some instances) can suffer. A strategy to improve water quality as

well as the appearance of the water feature needs to be developed.

Before going further, it should be noted that I am not a lake expert, and, in researching this article, I quickly realized that lake management is a lot like turf management. Many different factors contribute to the occurrence of aquatic weed problems and poor water quality. Weather is a huge contributing factor, and there are exceptions to every rule. Additionally, the end user often dictates the treatment strategies that are implemented to address short-term problems that may or may not be the best long-term solution for the water feature. Rarely is one single factor the cause of water quality problems. This sounds an awful lot like managing turfgrass.

However, they can become an aquatic eyesore if algae blooms and other aquatic weeds transform them into a green mess.

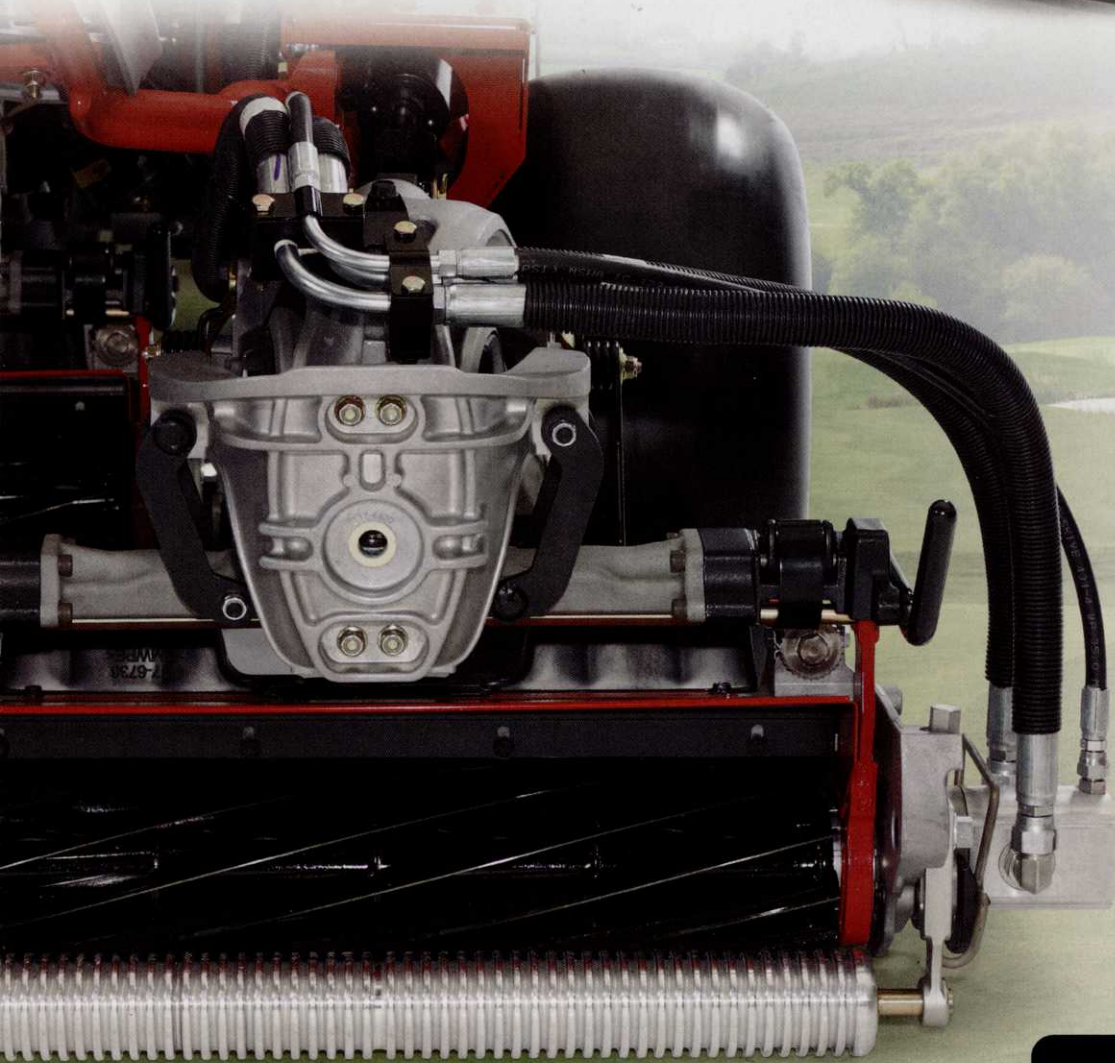


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**Count on it.**





Top: While circulation may not be the only issue affecting water quality, without good circulation the odds of a pond being unhealthy and an aesthetic nightmare are high. Bottom: Enhancing circulation with a fountain or other aerator cannot overcome other water quality problems, such as shallow pond depth or high nutrient load.

Moving water discourages the development of many common aquatic weed problems. During the summer months, sunlight warms the surface and upper layer of the water. Because warm water is less dense than cold water, a warm upper layer is formed and sits on top of a cold lower layer. Bacterial decomposition of organic matter can deplete the oxygen in the lower layer, creating a dead zone. This lack of oxygen may, in turn, lead to a phosphorous release that can fuel additional undesirable aquatic growth. Artificial circulation equipment increases oxygen levels and prevents strati-

fication in the water column by providing a mixing effect. However, different types of aeration/water circulation devices offer advantages and disadvantages, depending upon the size of the water feature and other factors.

**FLOATING FOUNTAINS.** Floating fountains are very popular on golf courses, and are installed as much for their aesthetic appeal as for their benefits for a lake or pond. These fountains effectively increase oxygen levels and improve circulation in smaller bodies of water. Water features five to eight feet

## 5 KEY POINTS

- Water features are an important aesthetic, environmental and practical feature on golf courses.
- Moving water discourages the development of many common aquatic weed problems.
- Floating fountains, while aesthetically appealing, effectively increase oxygen levels and improve circulation in smaller bodies of water.
- Diffusers that create smaller bubbles provide better mixing than those that create larger bubbles.
- Pond aerators are very efficient for adding oxygen to water.



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Floating fountains can be attractive, but for larger bodies of water, other forms of aeration/circulation equipment may be more cost-effective.

in depth that have surface area less than one acre may benefit from a floating fountain. Although larger bodies of water can benefit if fountains are used, the cost of electricity to power a fountain (or fountains) that provides adequate circulation may be prohibitive. Floating fountains can be attractive, but for larger bodies of water, other forms of aeration/circulation equipment may be more cost-effective.

**DIFFUSION AERATION.** The bubblers used for diffusion aeration are located at the bottom of the water feature. This allows the mixing of the water column as bubbles ascend to the surface. Diffusers that create smaller bubbles provide better mixing than those that create larger bubbles. Smaller bubbles provide greater surface area, which increases their impact as they rise through the water column. Diffusion aerators do not increase oxygen levels to the same extent as fountains or bubblers. However, they do an excellent job of preventing stratification of water features, allowing the water column to contain sufficient oxygen from top to bottom. The power source for diffusion equipment is located on land, which makes maintenance easier than floating fountains or surface aerators whose power sources are contained within the unit located in the water feature. Compared to other options, diffusion units require lower power inputs to treat the same surface area.

**POND AERATORS.** Pond aerators, sometimes called high oxygen transfer units, are very efficient for adding oxygen to water. On

golf course water features where fish populations are a significant consideration, aerators may be extremely beneficial. These units generally propel water above the surface of the lake or pond, but not in the manner of a fountain. The aggressive circulation provided around these units increases oxygen content most effectively. Multiple units may be needed for larger bodies of water. Keep in mind that increasing pond circulation and aeration may not cure a particular problem. Improved circulation helps with overall pond quality but may not be enough to combat algae and other pond weeds. Depth of water, as well as the continuing input of plant nutrients such as phosphorous and nitrogen, is a major contributing factor to the overall chance of maintaining a clean, healthy water feature.

When circulation is not adequate, biological applications of barley straw and other non-chemical techniques can help with water quality. In some instances, chemical treatment may be the only way to control a pond problem. Also, chemical treatment may be the only method that is quick enough to satisfy the aesthetic desires of the golf course clientele. Pond/water quality consultants can be an excellent resource for determining the best circulation units for a particular application as well as the best long-term approach to improve overall water quality.

So which unit is right for you? Many factors need to be considered. For example, in some instances on a golf course, a floating fountain or pond aerator may be annoying or distracting. A diffusion aerator may be more



desirable in that situation. Conversely, if the interest is an aesthetic display, a fountain is the best choice. For larger water bodies, it may take a combination of different circulation equipment to achieve aesthetic and water quality goals. Considering all options with the input of a knowledgeable lake/pond consultant will provide the best opportunity for long-term success in managing the appearance and water quality of golf course water features. **GCI**

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## DO YOU HAVE A DROUGHT MANAGEMENT PLAN?

If you don't, you should. Most courses only have a drought management plan if required to by an authority having jurisdiction over their water, such as a state or federal entity, but every golf course should have one. It is a lot easier to be prepared than to have to think on the fly when it is too late. Additionally, a drought management plan identifies and sets triggers to reduce water use long before you might find yourself in a drought situation.

Drought comes in many forms, not just when it stops raining. An emergency could occur that reduces or eliminates your primary water supply; mainline pipe failure on the golf course or in the municipally supplied lines, pump failure, treatment plant failure, a fire or a sink hole can all cause a drought-type condition. You never know what might happen – the trick is to have a plan.

Most states that require water-withdrawal permits for irrigation require a drought management plan as part of the permitting process. These states have certain levels of reduction that become mandatory by certain stages of drought as declared by the state, local government or water

supply. With each subsequent stage of drought, water reductions increase.

For example: in San Antonio Stage 1 requires that golf courses submit a drought management plan for in-play areas of the golf course – landscape must follow a one-day-a-week restriction for landscape irrigation. Stage 2 requires, in addition to Stage 1 requirement, no watering between 10 a.m. and 8 p.m. Stage 3 is watering only allowed per city ordinance. The various stages are automatically triggered by the level of the Edwards aquifer, which is the city's main water supply. Stage 3 is 640 feet, Stage 2-650 feet and Stage 1-660 feet above sea level. So the smaller the number the more impact. There is no subjectivity to these numbers as they are science-based.

In Las Vegas, each golf course must submit a water-use reduction plan. Minimally, the plan must contain a physical description of the course with detailed descriptions of irrigated areas, itemized accounting of water use for the calendar year, a review of spray irrigation efficiency, and a description of key water-use reduction

(continued on page 52)

Massachusetts Drought Levels				
Action Levels	Irrigated Tees & Greens	Irrigated Fairways	Irrigated Roughs	Irrigated Landscape & Ornamentals
Normal	100%	100%	100%	100%
Advisory*	100%	80%	50%	No Irrigation Allowed
Watch*	100%	60%	No Irrigation Allowed	No Irrigation Allowed
Warning*	100%	40%	No Irrigation Allowed	No Irrigation Allowed
Emergency**	TBD	TBD	No Irrigation Allowed	No Irrigation Allowed

\*Nonessential outdoor irrigation use shall not occur between the hours of 9 a.m. and 5 p.m., except that hand-watering of hot spots may occur at any time.

\*\* Mitigation actions to be determined by the Governor's Emergency Proclamation.