



Bubble Bath

Keeping golf course ponds clean using oxygen circulation and barley straw.

BY CHRIS HARTWIGER

Oxygen is released from the bubbler plates on the pond bottom. Unlike fountains, there is no distracting stream of water at the surface.

Ponds play an integral role in the strategy, ecology, and beauty of many golf courses. When maintained properly, a pond complements the surrounding landscape and makes a positive impression on those playing the course. Unfortunately, many ponds are unsightly and are cluttered with unwanted aquatic vegetation, particularly algae.

Bill Anderson, CGCS, golf course superintendent at Carmel Country Club (Charlotte, N.C.), faced an ongoing battle to keep algae populations under control in the ponds at Carmel C.C. All too often the ponds were overwhelmed with algae and became an eyesore. Aquatic herbicides were the typical remedy to bring the algae under control.

Bill thought there must be a way to manage algae populations preventatively instead of using a curative control with an aquatic herbicide. He found his answer in a GCSAA seminar on aquatic weed management: pond bubblers and barley straw.

POND BUBLERS

Aquatic weed managers have known for years that increasing the oxygen content in lakes can help reduce nutrient levels, limit thermal stratification, and decrease algae growth. Bill decided to try a submerged oxygen pumping system to increase pond oxygen levels. He used a commercial system that used an onshore compressor to pump oxygen through plastic tubing to feed bubbler units mounted on the pond bottom. Depending on the size of his ponds, Bill used models with either two or three bubbler units. Each unit is capable of circulating a water column of up to 4,000 gallons per minute. The size of the onshore compressors varied based on the number of bubbler units in the pond. Because the compressor is located onshore, there is no electricity in the water. There is no distracting fountain spraying water in the pond. The bubbles disperse at the surface and are hardly noticeable by golfers.

Once the number of bubbler units needed was determined, the next task

was deciding where to hide the onshore compressor. Bill had three ponds to treat and disguised the compressors in three different ways. One of the compressors was placed in a small underground vault away from areas of play. Another compressor was hidden above ground within the canopy of a large tea olive tree. The final compressor was placed in an above-ground vault located away from play.

BARLEY STRAW

The use of barley straw to control algae and clarify ponds was developed in the 1990s in England (Lembi, 2001). Researchers in the United States have tested barley straw with mixed results. The exact mode of action is unknown, but researchers have speculated that algae growth may be inhibited by a chemical exuded from the decomposing barley straw or by a metabolic product produced by fungi that decompose the barley straw. The consensus is that the control mechanism is believed to be algistatic (prevents new algae growth)

rather than algicidal (controls existing algae) (Lembi, 2001).

Bill Anderson purchased commercially available barley straw for use in the ponds at Carmel C.C. Guidelines obtained in the aquatic weed management seminar suggested packing the barley straw into long cylindrical netting so that water and air can circulate through the straw. A commonly recommended dosage is 225 pounds of barley straw per acre of water in shallow (four to five feet) ponds. Bill weighted the net tubes of barley straw and placed them in the pond. The barley straw is replaced approximately every six months.

RESULTS

The results at Carmel Country Club have been dramatic. Algae populations are under control and future blooms are being prevented by the bubbler system and barley straw. Chemical applications have been reduced. In 2001, aquatic



The long tube of barley straw is weighted and submerged in the pond.



The barley straw should be packed in long cylindrical tubes to allow the circulation of oxygen and water to speed the decomposition process.

herbicide applications were reduced by 72 percent and labor was reduced by 77 percent. Eventually, the cost of installing these systems will be offset by the savings associated with reduced chemical and labor costs.

The ponds at Carmel Country Club are now features that enhance the golf course. Best of all, the use of oxygen circulation and barley straw continues to work around the clock to keep the ponds in great condition. This innovative solution keeps staff involvement to a minimum, is cost effective, and is friendly to the environment.

REFERENCES

Lembi, Carole A. 2001. Barley Straw for Algae Control. APM-1-W. <http://www.agcom.purdue.edu/AgCom/Pubs>.

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