



What Do We Know About Barley Straw?

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Editor's Note: This article resulted from some conversations about barley straw on the Noernet. Thanks to the author, Gary Gaard and Audra Anderson.

When I started working for University of Wisconsin-Extension more than 25 years ago I went down to the lot one morning to pick up a fleet car. The fleet manager, long since retired, knew I was in the aquatic plant management business and started talking. He wanted to know if an article he read in an outdoor magazine about throwing bales of hay into a pond really "cleaned it up". I couldn't think of any good reason why it should. In fact it did not sound like a good idea to me. Putting something in a pond that demands oxygen and adds nutrients doesn't enhance the aesthetics or the health of ponds in our climate. The fleet manager tried to find the article for me but never could.

Over the intervening years, while conducting pond management courses around the state, the bale of hay in the pond trick surfaced occasionally in conversations with participants. No one could ever produce the article and I considered the technique as pond folklore.

About 1990 the technique came out of the realm of folklore with studies done in the British Isles on the use of barley straw to control algae in ponds, lakes, and canals. What I know about barley straw are the results of a trip I took to Ireland in 1994 to attend the European Weed Research Societies International Symposium on Aquatic Weeds. Papers were presented on the technique and there were demonstrations of its use in Irish canals. I took copious notes.

Before going further it is useful to know a little bit about the types of aquatic plants. The largest ones are called macrophytes. Pondweeds, lily pads, coontail, and cattails are examples of macrophytes. They are generally "higher plants" that flower and have vascular systems. Most can be easily seen with the naked eye but watermeal floats freely on the water surface and it no larger than a pin head. One group of algae, the stoneworts or Chara and Nitella, are macrophytes. Barley straw does not control macrophytes.

A second plant group is the filamentous algae. Individually they look like green strings or green hair. In numbers they form thick mats that float on the pond surface or produce green "wigs" on rocks, posts, or logs. I could find no evidence in my notes or in the literature that barley straw controls filamentous algae.

A final group of aquatic plants is the planktonic algae. Individually they are microscopic. They get noticed when populations reach levels where it looks like someone spilled pea soup or green, blue-green, red, or sometimes other colored paint into the water. Barley straw controls some planktonic algae but not all equally well. It is most effective against green and blue-green (actually now considered more closely related to bacteria) planktonic algae.

Luckily, these two types cause most planktonic algae problems in ponds during the summer. Other types like diatoms are less affected by barley straw. Diatoms tend to turn water a brownish color and are more commonly found in the spring and fall when water temperatures are cool. If your pond problem is caused by green or blue-green planktonic algae, barley straw may be worth trying. Otherwise you should investigate different options.

How does barley straw work? Scientists studying barley straw have demonstrated that it works. They are less certain how it works. A consensus of opinion is developing that the anti-algal agent is an organic compound produced by the microbial breakdown (decay by bacteria and fungi) on the lignin found in barley straw. There is also evidence that this breakdown does not occur in low pH waters so it is not a technique recommended in acid ponds.

How about other straw? I must confess skepticism that in the land of Guinness Stout and fine Irish Whiskey that barley straw just happened to have the best anti-algal properties. By the end of the conference I was convinced that barley straw works better than other straws. The rea-

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son is thought to be that barley straw is more resistant to decay. That probably means it has more lignin and it decays more slowly so the anti-algal properties remain in the water for a longer period of time. Other organic material such as "brownwood" (heartwood from hardwoods such as oak) and deciduous tree leaves (again oak was suggested) that are high in lignins or tannins might work equally well. The stalks of emergent plants like cattail and Phragmites were also suggested as having possibilities. These later materials are more available and probably cheaper than barley straw. I was assured by the Irish that even in the land of Guinness Stout that barley straw is hard to find.

How is barley straw used? It is important that the straw is well aerated in the water so decay occurs. The method I saw involved making "sausages" using a Christmas tree wrapping machine to stuff barley straw into plastic Christmas tree netting. The sausages were about 10 yards long and were staked along the edge of canals. It takes about one to three months in the Irish climate for enough decay to occur for the barley straw to become active. Activity lasts from six to eight months. As the straw becomes well decayed fresh sausages are put in the water to age before pulling out the old sausages. If the straw begins to smell bad it means oxygen is depleted. The straw bundle has gone anoxic and no longer works. The dosage varies from 3 grams of barley straw per cubic meter of water for maintenance control to 50 grams per

cubic meter to control heavy algae blooms. In real numbers, if my conversions are correct, this is between 8 and 135 pounds of barley straw per acre-foot of water.

Will barley straw work here? We won't know until someone tries it. My major concern is the difference in climate between Wisconsin and the British Isles. Their growing season is longer and the winters are not as severe. There are anecdotal reports from Australia, Canada, South Africa, Sweden and the U.S.A., besides Britain and Ireland that the technique works.

For golf course managers aesthetics is a concern. How will clientele respond to a straw sausage floating around in a pond? The sausages are also attractive to wildlife. Ducks and geese use them for nesting sites. Wildlife may be a positive or negative in your situation.

In summary, we don't know all the answers about barley straw. If your primary problem is planktonic green or blue-green algae, your pond water is neutral or higher pH, you don't mind straw filled sausages floating in your pond, and wildlife are not a bother, it may be worth a try. It is an inexpensive method to test. Do not expect immediate results — perhaps one to three months before the action begins. Once started, expect season long control. There are other materials such as wood, leaves, and cattail stalks that may work as well and are more available. A final reminder, good nutrient management around ponds should reduce algae over the long term. ♣



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