



Use of Herbicides in Lakes

The use of herbicides for controlling nuisance algae and rooted plants in lakes is one of the oldest forms of lake management (pulling by hand is the oldest). Contemporary lake management policy and practice encourages actions to prevent these nuisances in the first place, or if plant or algae nuisances already exist, to manage the causes when possible (see Holdren *et al.* 2001). However, algae and rooted plant problems are common and the use of aquatic herbicides is widespread in the US and throughout the world.

Many people are averse to using chemicals in lakes. While few people advocate indiscriminant or inappropriate chemical applications, this aversion to herbicides can foster an adversarial environment and result in conflict or a lack of consensus among lake management stakeholders. These conflicts are unnecessary and counterproductive to the extent they are based on misinformation or the lack of a comprehensive management policy or plan for a given lake.

What Are Herbicides?

Herbicides are chemicals used to control or eradicate unwanted, excessive or nuisance plants. The most common types of plants in lakes are rooted plants and algae, sometimes referred to as aquatic weeds. Lake plants may require control if they are excessive, obnoxious, toxic or non-native.

There are two general classes of herbicides: contact, meaning they kill portions of the plants they come into contact with, and systemic, meaning they kill the plants after they are absorbed by the plant, often killing plant roots and some reproductive parts. The action of herbicides may be non-selective, meaning they kill all plants or selective, meaning they target certain susceptible plants. Herbicides for algae control tend to be only contact, nonselective, while herbicides for rooted plants are available in both categories.

Only herbicides registered for aquatic use by the Environmental Protection Agency and state Departments of Agriculture can be used in lakes in the U.S. and it is illegal to apply these chemicals contrary to restrictions and directions on the product label. Most states also require permits for application of herbicides to water.

Issues & Concerns

1. Are herbicides safe? Obviously, herbicides are not safe for the targeted plant, which they are supposed to kill. Herbicides are tested and registered for use by EPA to assure unintended harm to lakes will not occur. As well, most states regulate the use of herbicides in lakes, presumably to assure their safe application. There is a real concern with inappropriate or misapplication of herbicides. As with lawn chemicals, there is often a temptation to abide by the saying, 'if a little is good, then more is better.' This does not apply to herbicide use in lakes because unintended damage to non-target plants or animals could occur. While there are some cases where a higher dose (within the label range) is more effective, overdosing of herbicides can reduce their carry-over effectiveness by not killing the plants, but just burning the contacted tissues. Determining and applying the appropriate dose is usually best left to professional applicators.

Herbicides are chemicals, some are 'natural' like copper and some are synthetic, but they are not necessarily unsafe. In fact, there are 'natural' chemicals that are dangerous (for example, nicotine). As a society, the majority of us accept the use of herbicides, bactericides, and fluorides in the production of our food and drinking water and the conventional wisdom holds that the proper and careful use of herbicides in lakes, and even water supplies, poses an acceptable risk.

There are some people who are averse to any kind chemical application in lakes. The tendency of these people would (presumably) be to espouse there be no use of herbicides, even if there are no other management alternatives. This approach may be acceptable, as long as the consequences - such as no control of the problem or more expensive methods - are understood.

2. Herbicides control the symptoms, not the cause of nuisance plant problems. Herbicide applications are necessarily a short-term remedy to longer-term problems. In most cases, the nuisance controlled with an herbicide will recur and require additional treatments for future control. Ideally, the cause of the nuisance is mitigated (when and if possible), but these are often long-term remedies. In many cases, the plant nuisance is so severe or extensive that there are few other practical remedies in the short-term, plant harvesting being a possible exception. Indeed, in the case of non-native species, the cause is usually irreversible.
3. Who should apply herbicides? Herbicides are best applied by trained, licensed applicators. Certainly those herbicides that pose applicator safety concerns or require specialized application equipment should be applied by properly trained and certified applicators. For those herbicides not requiring special training or equipment, it is often wise to use reputable applicators, as they have experience applying the product in the most effective manner, saving money, time and avoiding potential adverse effects. Anyone applying herbicides, must always follow label instructions.
4. When should plants be controlled? What one person may view as a nuisance, another person may see as a benefit. For example, rooted plants, especially native plants, provide fish habitat and water quality benefits. Therefore, controlling rooted plants will diminish these beneficial functions. If rooted plant growth is excessive, it can also have negative effects on fish. Herbicide use intended to kill unwanted plants is, by intention, disruptive. Usually, these 'disruptions' can be applied constructively; however, because lakes are complex ecosystems, it is not always possible to foresee the unintended consequences. For all of these reasons, herbicide use usually represents a balancing act, which can be best managed in the context of a lake management plan (see Holdren *et al.* 2001, chapters 3 and 8).

NALMS Positions

1. The management and control of nuisance aquatic plants using herbicides is most appropriate in the context of a comprehensive or integrated lake management plan.
2. Preference should be given to the prevention or mitigation (when and if possible) of the factors that cause aquatic plants to become nuisances.
3. Priority should be given to preventing the introduction of non-native species.

4. Native rooted aquatic plants are important to aquatic ecosystems and their control and destruction should be avoided or minimized. Once a lake is infested with a non-native species, its impact on native plants should be considered in its overall control.
5. More aggressive controls, including the use of herbicides, may be necessary to control non-native aquatic plants.
6. The application of herbicides by non-trained or nonprofessional applicators should be discouraged.
7. Anyone applying herbicides should always follow label instructions.

References

Holdren, C., W. Jones and J. Taggart. 2001. Managing Lakes and Reservoirs. North American Lake Management Society, Terrene Institute and the U.S. Environmental Protection Agency. Madison, WI.

Adopted by the NALMS Board of Directors

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