



RISKS VERSUS BENEFIT INFORMATION FOR PESTICIDE APPLICATIONS

Important Information That Makes Sense

What is a pesticide?

A pesticide is any substance or mixture of substances intended to control pest infestations. The word pesticide covers a very broad range of products that control a wide range of pests. Pesticides may be broken down into categories of products (herbicides, insecticides, fungicides, pesticides, miticides, and rodenticides). There is also another category known as plant growth regulators (PRO). In the world of aquatic plant management, herbicides and algaecides are the most used pesticides.

The Dose Makes the Poison

“Solely the dose determines that a thing is not a poison,” observed Paracelsus, the father of modern toxicology, more than 400 years ago. Paracelsus was right. Prescription drugs, for example, are therapeutic if taken in small doses, but can be dangerous if abused or taken in overdose proportions. Pesticides, like antibiotics are effective when used in the right circumstances but can become a threat to the environment or even human health if improperly used. Just as in medicine, the risks inherent in a particular pesticide must be weighed against the benefits from its measured use.

Why Are Pesticides Used?

Pesticides (Herbicides/Algaecides) are used to improve and maintain the recreational uses of water; a well-maintained lake or pond will increase the value of your home. They can also improve the overall aquatic eco-

system. A lake or pond that is choked with aquatic weeds can lead to stunted fish populations. Certain types of algae can be toxic to man, fish, and other aquatic life. Pesticides are used to bring a balance back into the aquatic ecosystem. It is important to know that all plants are not weeds. Therefore, no aquatic management plan should attempt to eliminate all plants from the aquatic system. As a professional lake management company, we have taken care to provide a program that both reduces nuisance aquatic plants and maintain plants to provide cover and food for aquatic organisms that depend on plants and algae for their very existence.

State and federal laws require that pesticides must be applied according to label directions. Labels direct users as to how, where, and at what rate the material must be applied. Upon request, your applicator will supply you with a copy of the label(s) for the product(s) applied.

Toxicology

Toxicity is the measure of a substance to cause harm. The risk associated with harmful substances is a combination of toxicity of a substance and the amount of exposure to the substance. In the case of aquatics both the toxicity and exposure are minimal. Most aquatic herbicides are mixed with water and evenly applied over the surface of the water. Dilution soon effects concentration of a herbicide in the water. For example, if a lake were treated with Diquat at one



gallon per surface acre (43,435 square feet), a 150 pound person would need to consume 3,750-7,500 gallons of treated water **immediately** after application, or 375,000 to 750,000 gallons of treated water within 10 to 14 days post treatment to ingest enough diquat dibromide to achieve a lethal dose concentration.

Pesticides are given a classification upon registration (approval to be used) with the Environmental Protection Agency. There are two broad classifications of pesticides as established by the EPA. The first classification is **general use pesticides**.

These are considered lower in risk and are available for sale and use by the public. Examples would be herbicides for dandelion control, weed and feed fertilizers, copper sulfate, Aquathol-K and Navigate.

Most herbicides used in aquatic are for general use. The second classification is **restricted use pesticides (RUP's)**. These products can only be purchased by state certified and trained professionals. The Michigan Department of Agriculture currently certifies Commercial Pesticide Applicators, pursuant to Act 171 of Public Acts of 1976 as amended.

Environmental Fate

Many questions are asked about what happens after a pesticide is used in a lake or pond. Generally, pesticides break down rapidly in the environment. Depending on the products used, a combination of sunlight, water chemistry, and microbial action break the pesticide down into natural components. Some pesticide ingredients bind with sediments and are no longer available as an herbicide.

Relative Toxicity of Chemical Substance

Chemical		Acute Oral-Rats LDC/50-mg/kg
Sodium Cyanide	Most Toxic	6.4
Nicotine		53
Caffeine		192
Endothall		206
Diquat		230
Copper Sulfate		300
2,4 (DMA)		500-1000
Aspirin		1000
Table Salt		3000
Glyphosate (Rodeo-Roundup)		5,600
Fluridone (Sonar)	Least Toxic	10,000

Regulations

Currently professional lake managers are regulated by two different agencies. The Michigan Department of Agriculture provides licensing and certification of commercial applicators. The applicator can then provide services for hire. In the case of public waters, the Michigan Department of Environment, Great Lakes, and Energy (EGLE) (formerly the Michigan Department of Environmental Quality (MDEQ)) provides permits of nuisance aquatic plant control using herbicides.

Department of Agriculture & Rural

Development The Michigan Department of Agriculture and Rural Development (MDARD) mandates that any company offering aquatic weed control service must have both a commercial license and personnel with a commercial pesticide applicator certificate. For certified applicators to maintain their license, they must either participate in a MDA approved continuing education course or take a written exam every three years. They may also attend a prescribed number of conferences.



and meetings that present the latest research concerning aquatic pesticides, proper usage, and new application techniques within the industry to renew their license. One such group in Michigan is the Midwest Aquatic Plant Management Society which hold their annual meeting each spring. The MDARD also determines which pesticides can be used in Michigan. All pesticides used in Michigan must be registered with the EPA and MDA. If you have a question about a particular pesticide, give us a call. If we cannot answer your question, please feel free to contact the MDARD, Plant & Pesticide Management Division, in Lansing, MI., at (517) 373-1087.

Department of Environment, Great Lakes, and Energy

The Department of Environment, Great Lakes, and Energy (EGLE) provides permits for herbicide applications in public waters. Public waters are defined as any body of water with an outflow (permanent or intermittent), or two or more owners, or water bodies larger than ten surface acres in size. The DNR Inland Lakes Management Unit can answer questions that you may have (517-373-8000).

Product Registration

All products are regulated by EPA and must maintain registration with the agency. The EPA determines if a product will be a general use product or a restricted product. This is an ongoing process. EPA may at any time ask additional data related to a given product and may request to see any data that a company has on any registered product. Companies are required to keep all data on a pesticide for the life of the compound. This means that with older compounds they may have to

keep data that is over 50 years old and be able to provide it to EPA on request. Registration and re-registration of a compound is estimated to cost the producer between 2.4 and 4.0 million dollars. The cost of research and development for new products is typically between \$30 and \$70 million dollars before the first unit can be sold commercially.

Common Sense

All pesticides can cause harm at some level of use. However, our applications will be made where there is essentially no chance for direct exposure to a compound in its concentrated form on anyone who is not an applicator. If a treatment of your lake or pond has been done, and you cannot find a notice indicating that any water use restrictions have been placed on the water, call us and we can tell you if any precautions need to be taken. It should be noted that there are two distinct categories of treatments for the control of nuisance aquatic plants and algae. The first category is treatment for control of submerged aquatic plants.

These treatments normally are done using herbicides that place water use restrictions on the treated areas of the water body. Signs are posted in the treatment areas indicating any special precautions that should be taken. If no signs are posted in a treatment area the water can be used for whatever purpose you wish, as swimming, fishing, watering the grass, and boating.

Great care and thought have gone into determining the best management treatment plan for controlling nuisance aquatic plants and algae in your body of water. The pesticides selected will provide good control with minimal risk.