

RISK/BENEFIT STATEMENT

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, picicides, miticides and rodenticides). There is also another category known as plant growth regulators (PRG). In the world of aquatic plant management, herbicides and algaecides are the most commonly 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 gained 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.

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 Reward (formerly 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 fifty percent of the time. The actual usage rates are far below the LD/50 rates. This means that an application would have to far exceed the maximum labeled rate to place enough herbicide in the water to achieve the LD/50 of a given herbicide.

Relative Toxicity of Chemical Substances*

	Acute Oral – Rate LDC/50 – mg/kg
Fluridone	10,000
Glyphosate	5,600
Table Salt	3,000
Aspirin	1,000
2,4-D (DMA)	300-1,000
Copper Sulfate	300
Diquat	230
Endothall	206
Caffeine	192
Nicotine	53
Sodium Cyanide	6.4

* From AQUAPHYTE, Volume 6, No.1

LDC/50 (lethal dosage / 50%; is the amount of active ingredient required to cause the death of one-half of the test population.

One Part per Million is equal to:

- 1 inch in 16 miles
- 1 minute in two years
- 1 penny in \$100,000.00

One Part per Billion is equal to:

- 1 inch in 16,000 miles
- 1 second in 32 years
- 1 penny in \$10 million dollars

Typical application rates for Endothall base herbicides are between .1 ppm (parts per million) and 5 ppm. The LD/50 for endothall is 206 ppm (over 40 times max. label rate). Diquat is normally applied at rates varying between .74 ppm and 1.48 ppm. These herbicide usage rate are expressed in parts per million, or even parts per billion in the case of Fluridone. The above comparisons may put these numbers (ppm-parts per million & ppb-parts per billion) into better perspective.

Pesticide Classification

Pesticides are given a classification upon registration (approval to be used) with the Environmental Protection Agency (EPA). 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 general public. Most herbicides used in aquatics are labeled as general use pesticides. 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 and Rural Development (MDARD) currently certifies Commercial Pesticide Applicators, pursuant to Act 171 of Public Acts of 1976 as amended.

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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 pesticide or a restricted use pesticide. This is an ongoing process. EPA may, at any time, ask for 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 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.

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.

State of Michigan Regulations

Professional lake managers are regulated by various State and Federal agencies. The Michigan Department of Agriculture and Rural Development 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 Environmental Quality provides permits of nuisance aquatic plant control projects through an understanding with the Environmental Protection Agency.

Department of Agriculture and Rural Development (MDARD)

The Department of Agriculture and Rural Development mandates that any company offering aquatic weed control service must have both a commercial business license, and personnel that have a commercial pesticide applicators first obtain a pesticide applicator business license and all applicators must be certified pesticide applicators. certificate. For certified applicators to maintain their license certification they must either participate in a MDARD approved continuing education course or take a written exam every three years. They may also attend conferences and meetings that present the latest research concerning aquatic pesticides, proper usage, and new application techniques within the industry. One such group is the Midwest Aquatic Plant Management Society (mapms.org) that holds its annual meeting in March. MDARD also determines which pesticides can be used in Michigan. All pesticides used in Michigan must be registered with the EPA and the MDARD. 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, 1-800-292-3939.

Department of Environmental Quality(MDEQ)

The Department of Environmental Quality provides permits for nuisance aquatic plant control projects through an understanding with the Environmental Protection Agency. The MDEQ, Water Resource Division, Aquatic Nuisance Control Program can answer questions that you may have (517-284-5593).

Water Use Restrictions

The use of aquatic herbicides can result in water use restrictions being placed on waters that have been treated. These water use restrictions may include; a no swimming restrictions and/or no fish consumption and irrigation restrictions. When an application is done that places water use restrictions on a water-body, signs are posted along the area that was treated. These signs should include the name of the pesticides used, the date of application, any restrictions that apply and the name, address and phone number of the company or person that applied the pesticides. If the application was for the control of algae, it may be possible that if no signs are posted in a treatment area, that a copper based herbicide was used and has no restrictions. If you should inadvertently use the water, and then find out an application was done and water use restrictions are in effect, first take a good shower, then give your professional lake manager a call. Odds are that the pesticide has been diluted to the point that it is not a real threat to people or animals (see the "dosage" discussion above), but be sure to give your professional lake manager a call anyways. In conclusion, if you have any questions or would like a specimen label or **safety data sheet (SDS)** give your professional lake manager a call.

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 to anyone who is not an applicator. Signs are posted in and around the treatment areas, as required by law, indicating any special precautions that should be taken. 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.

Should you observe an unusual effect following a pesticide application, immediately wash with soap and water. Then call your professional lake manager. Should they not be available, consult with your physician. It is important to provide the doctor with any information you may have concerning the pesticide/s used. In an emergency contact the Children's Hospital of Michigan Regional Poison Control Center at 1-800-222-1222.

Visit <http://www.childrensdmc.org/PoisonControl> for more information.

General Comments

Overall great care and thought has gone in determining the best management programs for the control of nuisance aquatic plants and algae on your lake or pond. The herbicide/algaecides selected will provide good control without going over board. Our approach is to manage high use areas, and yet leave some areas untouched. This allows for a balanced eco-system.

Should you have any comments or questions please do not hesitate to give your professional lake manager a call;

Your Professional Lake Manager is: Michigan Lakefront Solutions LLC
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