



# Risk Benefit Statement

## What is a Pesticide?

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

## How Pesticides Work

Products intended for use on your property are applied as a liquid, dust, aerosol, granule, or bait and are generally active for a few minutes to a few months. Some compounds control pests on contact by damaging the physical structure of the pest. Other compounds become active only after they are absorbed or ingested, by interfering with physical development or the reproduction ability of the pest. The pesticide product label contains specific information on how to control targeted pests. All pesticides must be applied in accordance with label directions. Pesticides may be effective against a large class of organisms or they may be specific to a particular organism. This means that many times, applicators can choose an effective pesticide or pest control strategy that will minimize potential impacts to humans, pets and other non-target organisms.

## 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 would increase the value of your home. They can also improve the general aquatic ecosystem. A lake or pond 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. Your professional lake manager has taken care to provide a program that both reduces nuisance aquatic plants and maintains some plants to provide cover and food for aquatic organisms that depend on plants and algae for their very existence.

## Toxicology

Toxicology 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 aquatics industry, 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 the concentration of an herbicide in the water. For example, Reward (formerly Diquat) when applied at two gallons per surface acre would require a 150-pound person to consume 3,750-7,500 gallons of treated water immediately after application to ingest enough active ingredients (diquat dibromide) to achieve a lethal dose concentration 50 percent of the time. Typical application rates for Endothol products (Aquathol and Hydrothol) are between 1 ppm (parts per million) and 5 ppm. The LD/50 for Endothol is 230 ppm. Herbicide usage rates are expressed in parts per million or even parts per billion in the case of Sonar.

### RELATIVE TOXICITY OF CHEMICAL SUBSTANCES

Less Toxic	Acute Oral-Rates LDC/50 mg/kg
Fluridone	10,000
Glyphosate	5,600
Table Salt	3,000
Triclopyr	2,574
Aspirin	1,000
2,4-D	300-1,000
Copper Sulfate	300
Diquat	230
Caffeine	192
Nicotine	53
Sodium Cyanide	6.4

#### Most Toxic

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

For additional comments or questions:

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## Pesticide Classification

Pesticides are given a classification upon registration with the EPA. There are two broad classifications of pesticides as established by the EPA. The first classification is general use pesticide. These are considered lower in risk and are available for sale and use by the general public. Most of the herbicides used in the aquatic industry are for general use. The second classification is restricted use pesticides (RUP's). Reward is a RUP. These herbicides can only be purchased by state certified 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 regarding 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 pesticides, such as Diquat bind with sediments and are no longer available as an herbicide.

## Regulations

### Department of Environmental Quality (DEQ)

The Department of Environmental Quality (DEQ) regulates the use of herbicides and algaecides by issuing permits to control nuisance aquatic plants. The DEQ provides licensing and certification of commercial applicators. The DEQ can answer questions at [www.michigan.gov/DEQ](http://www.michigan.gov/DEQ) or 517-284-5593.

### Michigan Department of Agriculture (MDA)

The Department of Agriculture mandates that any company offering an aquatic weed control service must have both a commercial license and personnel with pesticide applicators certificates. For certified applicators to maintain their license they must either participate in an MDA 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 in Michigan is the Midwest Aquatic Plant Management Society that holds its annual meeting in March. All pesticides used in Michigan must be registered with the MDA and the EPA. If you have a question about a particular pesticide, contact your professional lake manager.

## Product Registration

All products are regulated by the EPA and must maintain registration with agency. The EPA determines if a product will be a general use product or a restricted use pesticide. The EPA may at any given time ask for additional data on a product. Companies are required to keep all data on a pesticide for the life of the compound. Registration and re-registration of a compound are 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 product can be sold commercially.

## Common Sense

All pesticides may cause harm at some level of use. There is little chance for direct exposure to an herbicide in its concentrated form to anyone who is not a pesticide applicator. If a treatment of your lake or pond has been performed and you cannot find a notice indicating water use restrictions, it is highly probable that non-water restrictive products such as copper sulfate or cutrine-plus have been applied. There are two distinct categories of treatments, nuisance vegetation and nuisance algae. Treatments for aquatic vegetation normally involve some type of water restrictive product and requires the posting of restriction signs. Algae treatments usually involve non-water restrictive products and therefore a green posting sign will be used.

## General Comments

Overall great care and thought have gone in deciding the best management program for the control of nuisance aquatic plants and algae on your lake or pond. Our goal is to manage the high use areas of the water body; eliminate exotic species (non-native) such as Eurasian milfoil; and provide a good habitat for fish and other aquatic life.

Should you observe an unusual effect following a pesticide application, immediately wash with soap and water and call your professional lake manager and your doctor. Your doctor will require information about the products applied. Additional emergency information about the pesticide maybe obtained by contacting the **Poison Control Center at 800-632-2727 (616 area code), or 313-745-5711 (313, 810, 517, or 906 area code)** or the National Pesticide Telecommunications Network at 800-858-7378.

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