For your information and file*

Risk/Benefit Information

What is a Pesticide?

A pesticide is any substance or mixture of substances 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, pesticides, 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.

RELATIVE TOXICITY OF CHEMICAL SUBSTANCES*

		Acute Oral - Rats LDC/50 - mg/kg
Fluridone	Less Toxic	10,000
Glyphosate		5,600
Table Salt		3,000
Aspirin		1,000
2,4-D (DMA)		300-1000
Copper Sulfate		300
Diquat		230
Endothall		206
Caffeine		192
Nicotine		53
Sodium Cyanide	More Toxic	6.4

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Why are Pesticides Used?

Pesticides (Herbicides/Algaecides) are used to improve and maintain the recreational uses of water; a well maintained lake or pond may increase the value of your property. Aquatic pesticides can also improve the overall aquatic eco-system. A lake or pond that is choked with aquatic weeds can lead to stunted fish populations, stagnant waters, and low oxygen levels. 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 <u>not</u> weeds. Therefore, no aquatic management plan should attempt to eliminate all plants from the aquatic system. *Aqua-Weed Control Inc.* will recommend a program that both reduces nuisance aquatic plants (usually non-native plants) and maintains specific plant species (usually native plants) to provide cover and food for aquatic organisms that depend on plants and algae for their existence. It is very important for lake group leaders to understand and to communicate to other lake front property owners that the best approach to aquatic plant management is a balanced approach and that, for the most part, the goal should be to control non-native aquatic plants while encouraging, and only minimally managing, the growth of native aquatic plants.

It should also be noted that the Environment, Great Lakes & Energy (EGLE) regulates the type and amount of aquatic plant species that can be removed from a lake.

Toxicology

Toxicity is the measure of a substances ability 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 aquatic herbicides 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 an herbicide in the water. Take the case of Reward (formerly Diquat), when applied at two gallons per surface acre (43,435 square feet) a 150 pound person would need to consume 3,750 to 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.

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. Examples would be herbicides for dandelion control, weed and feed fertilizers, copper sulfate, Aquathol-K and Aqua-Kleen. The majority of herbicides used in aquatics are for general use. The second classification is **restricted use pesticides** (RUP'S). These products include Reward and Hydrothol. Only state certified and trained professionals can purchase these herbicides. 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, usually within a few days. Depending on the products used, a combination of sunlight, water chemistry, microbial action, and plant up-take break the pesticide down into natural components. Some pesticide ingredients eventually bind with sediments and are no longer available as an herbicide.

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 Natural Resources and Environment provides permits of nuisance aquatic plant control using herbicides.

Department of Agriculture (MDA)

The Department of Agriculture mandates that any company offering aquatic weed control service must have both a commercial license and personnel with pesticide applicators 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 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.

The MDA also determines what pesticides are allowed for use in of Michigan. 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 or contact the MDA, Plant & Pesticide Management Division, in Lansing (517-373-1087).

Environment, Great Lakes & Energy

Environment, Great Lakes & Energy (EGLE) provides permits for herbicide applications in public waters. Besides your commercial applicator, EGLE Inland Lakes and Remedial Action Unit can answer questions regarding which water bodies may require a permit and the permit process (517-241-1300).

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 use pesticide. This is an ongoing process. EPA may at anytime 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 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, applications will be made where 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 done, and you cannot find a notice indicating that any water use restrictions have been placed on the water, call your professional lake manager and ask what was done and if any precautions need to be taken. It should be noted that there are two distinct categories for treatments to control the nuisance growth of aquatic plants and algae. The first category is treatment for control of submerged plants. These treatments normally are done using herbicides that place water use restrictions on treated areas of the water body. The second category is algae control treatments. These treatments are almost always done using a copper based herbicide. Copper based herbicides/algaecides place no water use restrictions on the treated waters.

Water Use Restrictions

The use of aquatic herbicides can result in water use restrictions being placed on waters that have been treated. These restrictions are listed on the product labels and/or added by EGLE as an added safety measure. These water use restrictions may include; a no swimming restrictions (added by EGLE) and/or no fish consumption and/or irrigation restrictions. When an application is done 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 you should inadvertently use the water, and then find out an application was done and water use restrictions are in effect, call your professional lake manager. The likely hood of damage or harm is remote because the volume of water where the pesticide is applied will dilute the chemical to the point that it is not a threat to animals or your landscaping.

Please note that none of the products currently approved in Michigan list a swimming restriction on their labels. However, EGLE requires a 24 hour no swimming restriction posted when "plant killing" herbicides are applied. EGLE does this as an added safety measure and to prevent swimmers from interfering with the products ability to control the target plant/s.

If you have any questions or would like a specimen label or Material Data Safety Sheet please give your professional lake manager a call.

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Member of:

Michigan Aquatic Managers Association
Dedicated to the Professional Management of Michigan's Aquatic Resources