DOWNLOAD PDF AQUATIC HERBICIDES AND ALGAECIDES, 1971

Chapter 1 : Aquatic Plant and Weed Control Products | Texas Lakes and Ponds

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There has been a dramatic change in the laws that govern all aquatic applications of any product. This applies to everyone on all sized ponds and lakes and all products including bacteria, enzymes and dyes. There are no exceptions to this permit. There are some exemptions to some parts of the permit, but the permit, by law, must still be obtained prior to any application being made. Even private homeowners on their own backyard small pond must legally have a permit. EAM can answer any questions on this matter. For one low application fee EAM, with 20 years of application expertise, can make the needed applications for you. The permit and all required paperwork, mapping and documentation are included at no charge. EAM offers several different choices in algaecides. All products are EPA registered, approved and labeled. There are no restrictions on swimming, fishing or irrigation on any of these algaecides. Extra lables and MSDS sheets available upon request. Cutrine Plus Liquid 1 gal. Cutrine controls a broad range of filamentous and microscopic algae and is the most widely used algaecide. Cutrine Plus Granular 30 bags This granular formula is ideally suited for a variety of bottom growing algae and for use off docks, beaches and spot treatment. Phycomycin 50 bags A non copper option specifically designed for control of blue-green algae and cyanobacteria Green Clean Pro 50 bags A non-copper based, EPA approved algaecide that controls a wide variety of algae including blue green and other microscopic algae. EAM offers several different choices in herbicides. There are some restrictions on swimming, fishing or irrigation on any of these algaecides. Read and follow label instructions before use. Extra labels and MSDS sheets available upon request. Clipper 1 and 5 containers Clipper controls floating plants like watermeal and duckweed and also a wide variety of other aquatic plants and algae. The mode of action is systemic to ensure complete kill of the entire plant. Specifically designed to control Exotic species like milfoil and no effect the native species of submerged weeds. Also controls duckweed and watermeal. EAM offers several organic aquatic dyes. Aquatic dyes shad out sunlight and curb algae growth. There are no restrictions on swimming, fishing or irrigation on any of these dyes. It contains both blue and yellow dyes. Aquashade is the only EPA labled aquatic dye on the market. Cygnet Select 1 gal. It is a good economical choice for a lake or pond dye. Aquashadow 4 packets per box Aquashadow is easy to apply in a water soluble bag. Just throw it in the pond and it will create a natural blue color.

Chapter 2 : Surface Water Treatment

Aquatic herbicides are used to reduce the abundance of invasive species to reduce spread to new water bodies, to help maintain a healthy native plant community that is beneficial for fish and other aquatic organisms, to improve navigational access to lakes and rivers and make boat navigation safer, and to control nuisance plant and algae growth that can pose a hazard to swimmers.

PageContent More questions are received about aquatic plant problems in small ponds than any other topic. Aquatic plants provide habitat for fish and small pond creatures. According to biologists, plant cover between 20 and 40 percent is ideal for warmwater gamefish such as largemouth bass, bluegill, and channel catfish - the species recommended for small ponds by the Division of Fish and Wildlife. However, there are some situations where aquatic weeds are a problem and may be difficult to control. Using best management practices to limit the flow of nutrients into a pond is the best way to prevent aquatic weed problems in the first place. There are two groups of aquatic plants: Algae can be either planktonic or filamentous. Planktonic algae, too small to be seen with the naked eye, often give a green or reddish cast to the water. Filamentous algae form long threads and often float in mats on the surface. The filaments can be picked up and, although limp, will remain thread-like. Algae can sometimes be prevented by an early spring application of barley straw or controlled temporarily using algaecides. Rooted aquatics are those plants with roots and are differentiated by their habitat. Emergents, such as cattails, are rooted in the sediments but have leaves and flowers sticking out of the water. They frequently grow along the shoreline or in shallow water. White water lily and duckweed are typical native floating plants. Some of the exotics not native to Delaware such as water hyacinth and water lettuce also belong to this group. Submergent plants are those where most of the plant remains underwater, such as coontail and bladderwort. Hydrilla and fanwort are two exotic species which fall into this category. Once you have identified the type of plant, you can decide how to control it. Aquatic herbicides are one of the tools available for the control of aquatic plants. It is important to note that the plants are symptomatic of high nutrient levels nitrates and phosphates within the pond. Herbicides generally kill the majority of the targeted plants present, but the nutrients go back into the water column as the plants decompose. They then become available to surviving plants to produce more growth or allow another plant species or algae to take over. Other tools that may be used to control plant abundance are mechanical removal or triploid grass carp. Triploid grass carp are useful to control many rooted, submersed plants that remain under the water surface plants, but may take 18 months or more for results. For more information, contact the Fisheries Section Fanwort Cabomba caroliniana It is critical to read the entire label of any herbicide used to determine appropriate application rates, restrictions, and precautions. Not all herbicides control all species, therefore it is important to use only those recommended by our biologists or that specifically list the plant pest that you have. If you have any questions, contact the manufacturer. If plants cover more than half of the pond surface, two half-pond treatments separated by a period of two weeks should be made to prevent a fish kill due to a lack of oxygen when vegetative material decomposes. An exception is fluridone which is slow-acting enough that the entire area may be treated at one time. Some common restrictions include those for:

Chapter 3 : Aquatic Algaecides

Aquatic herbicides and algaecides, (Chemical process reviews) by Joseph H Meyer. Noyes Data Corp, Paperback. Good.

Teten, both of Minneapolis; William G. Paterson, Roseviile, all of Minn. Application of a herbicidally effective amount of a substantially insoluble copper-containing compound to areas of water infested with undesirable aquatic plants so that the compound comes into contact with the plants and is held thereby, destroys said plants with minimal pollution of the water and toxicity to other forms of aquatic life. These waters are becoming more subject to pollution with the growth of population, and thus, aquatic plant growth has become a serious problem. Especially troublesome plants are Chara vulgaris, filamentous algae, and vascular plants such as Ceratophyllum demersum, Elodea canadensis, and Najas guadalupensis. Chara is a green alga having a skunk or garlic odor and a rather slick taste. Closely related to Chara, and as troublesome, is an algae called Nitella having a green color, a grassy odor and a bitter taste. Not only are these algae noted for their odor and taste but they also cause slime, discoloration of water and corrosion of metal and concrete. These unsightly, obnoxious plants grow both beneath and on the surface of the water. The algae have been troublesome to boaters, fishermen, and swimmers, are very unattractive in residential areas and create health hazards by infesting portable water supplies. Further, certain phankton algae in the water can be toxic to people or animals that come in contact with it by swimming in or drinking the water. Examples of other toxic algae are Anabaena and Aphanizomenon. Various attempts have been made to subdue the growth of aquatic plants, especially algae, or destroy them. A compound commonly used at the present time is soluble copper sulfate. Copper sulfate, however, does not control aquatic plants to the extent desired. The compound is ineffective in controlling many aquatic plants such as Chara vulgaris, Cladophora and Nitella. To obtain effective control of some aquatic plants using copper sulfate, as well as other aquatic herbicides used presently, large amounts must be used to raise the copper concentration of the entire body of water to an effective dosage rate. At this effective dosage rate, with such large amounts being required, these compounds are generally toxic to desirable aquatic life such as fish and certain plants, particularly in soft water. Further, these compounds may be toxic or hazardous to the applicator and there is a large amount of water pollution resulting from their use. It has also been found that water-soluble compounds such as copper sulfate and alkaline algicides such as sodium arsenite and long chain alkylamine salts of endothall tend to be corrosive to pumping and spraying equipment used in applying the compounds to the infested water. SUMMARY OF THE INVENTION According to the present invention, undesirable aquatic plants are destroyed by application of a herbicidally effective amount of a substantially insoluble copper-containing compound to the locus that is infested with these plants in a manner so that the compound comes in direct contact with the plants and rests on the plant surface or is held thereby. Among the many substantially insoluble copper-containing compounds which have been found useful, the preferred are basic copper ll carbonate, copper ll bicarbonate, copper I oxide, copper ll benzoate, copper II hydroxide, copper ll oxide, copper I thiocyanate, copper l azide and copper ll azide. Copper azide is considered explosive but if kept wet in a slurry, is safe for use. Basic copper ll carbonate hereinafter referred to as copper carbonate is generally preferred as it is easily obtained, inexpensive, and very effectual. This material is essentially percent CuCO Cu OH with slight traces of other metals and is commonly called malachite. Although the compound has been used for the control of terrestrial fungi and, in conjunction with other materials, for the control of swimmers itch, by controlling snails carrying the infectionproducing parasite, to applicants knowledge insoluble coppercontaining compounds have never been used to control aquatic plants as described herein. In fact, hydrobiologists have stated that it is the formation of insoluble copper carbonate in the alkaline water that renders copper sulfate unusable in some cases as an algicide. See, for example, Domogalla et al. Trout News, March- April, , pg. It has been stated also, according to the above reference that the heavy copper carbonate precipitate in the water would be toxic to fish and also reduce fish food organisms in the bottom muds. Although the insoluble character of the compounds used in this invention suggests that they would be poor aquatic herbicides, it was found that the

insoluble copper-containing compounds effectively controlled undesirable aquatic plants without having an adverse effect upon fish and other aquatic life. The use of relatively insoluble copper compounds has proven to be nontoxic to desirable aquatic life and yet destructive to undesirable plants primarily because of the mechanism by which the compounds work. The copper-containing compounds, such as malachite, are in the form of wettable powders. Compounds not inherently wettable may be made so by the addition of a wetting agent such as sodium dioctylsulfosuccinate. Other inert ingredients may also be added to modify the aquatic herbicide, these modifications being well known in the art. For example, for certain compounds it may be desirable to include a dust inhibitor such as glycerine. When mixed with water, the slurry is sprayed on the surface of the water only in the area of infestation rather than underwater and, upon solubilizing, permeating the entire area, the latter being recommended for soluble algicides. As the compound settles through the water, it settles on or clings to the plant. At this point there is a very slow dissolution of copper ions into the previously copper-free area at the plant surface. As a small amount of copper ion is released, it is absorbed by the plant thus causing additional copper ions to be slowly released. This type of reaction is best described as the Le Chatelier principle of equilibrium. In accordance with that principle, the absorption of the copper by the plant creates a pressure on one side of the reaction which upsets the solubility equilibrium. Taking the copper ions out of solution by the plant causes the release of more copper ions into that area which in turn are absorbed causing the release of again more copper ions. This controlled release requires that only a small amount of the slightly soluble copper-containing compound need be used and demonstrates the importance of the copper compound being substantially insoluble. High concentrations of the copper ion need not be used and, therefore, do not exist in areas other than at the plant surface where the copper is absorbed. As a result, toxic effects on desirable organisms in the surrounding area are avoided. Due to the low solubility of the copper-containing compounds of this invention, which is below 50 mg. This is an especially desirable result when the compounds are used in reservoirs which supply the water for a city. Other advantages are that the algae control may be localized to the treated area only and the compound does not lose its toxicant through absorption by bottom muds as do granular formulations employing soluble materials. The compounds of this invention are highly effective under a wide variety of aquatic conditions. The material is effective in water over a wide range of temperatures. It is further effective under varying conditions such as water clarity, hardness, total alkalinity, pH, and other parameters and is effective at essentially all growth stages of Chara and filamentous algae. Further, the material is noncorrosive to pumping equipment and mixing tanks and is safer to the applicator than soluble copper-containing compounds. The substantially insoluble copper-containing compound Compounds. Localized treatment in accordance with this inuseful in the present invention,asheretofore described, h ve a vention allows destruction of unwanted aquatic plants with solubility in pure water up to about 50 mg. The preferred solubility range The following hohhmitthg examples will serve to further for these compounds is from about 0. An early solubilization of these compounds garis and filamentous algae. The lake bottom was silt. Five results in effects as those observed with copper sulfate and ob- Pounds of finely divided about m hasle pp viates those advantages described with using insoluble copper carbonate were mixed h 30 gallons of water and the resultcompounds having localized activity at the plant surface, such 8 slurry was sprayed uhltotmly Over the e of the s as reduced toxicity to fish, reduced pollution and the use of P by means ofa mechanical Sprayer- The Particles of basic small amounts. The compounds should be in a finely divided copper carbonatevsemed through the water and l rest form so that intimate contact can be made with the undesiraon the filamentous e The i temperatmie ble Plant and increase the emcacy of the absorption of the was 72 F. Within l0 days, an obvious condition of chlorosls copper by the plant. For the purposes of the invention, the grew lose colgr g i becmlne l z gy copper compounds are ground to about 0. The Chara had a moribund appearance and m dlameter and to I00 mlcrons preferred Granular gradually disappeared from the test area over the next several material sinks to l bottom and would not be desirable for weeks. The Chara and algae in the areas surrounding the test the purposes of the invention. The substantially insoluble copper compounds of the present invention have crystalline densities of well in excess of EXAMPLE II the density of water so that these materials will settle readily A foot perimeter of a small lake was treated at a dosage therein. The sedimentation characteristics of these comrate of 20 pounds per acre of

similarly divided basic copper pounds were determined by dispersing 5 g. The treated area amounted to 2. The adjacent lakes were similarly infested. The lake perimeter was treated in several stages by mixing the 6. The resulting green slurry was sprayed uniformly over the surface of the treated area. The water temperature was 82 F. Within a week following treatment, the treated vegetation acquired a pale and sickly tube were used to count the particles as they passed the monitoring section. Sedimentation was the greatest in about 8 minutes and most of the material settled 20 minutes after application. Results indicate that most of the particles settle on the plant surface in 8 to 20 minutes and are not dispersed throughout a large area. This is important as only the amount of copper that is required to control algae in a given area is needed rather than saturating a whole lake or pond with the 40 material. Toxicity to desirable species is minimal and cost appearance, and it gradually disintegrated and disappeared greatly f from the treated area. Virtually complete control of Chara water Solublhty the copper fompounds of the present was observed after 3 months. The copper content equivalent to l p. The present parts per million while lake water with malachite has a copper method of treatment offers a big margin of safety to fish comcontent of parts per million. These results indicate that pared with treatments using Soluble pp compoundsthe malachite or basic copper carbonate is substantially in- EXAMPLE m soluble in distilled water or lake water thus offering a large margin of safety to other marine life. The compound may be used in a range of one-half to pounds per acre but preferably something less than 5 to 20 pounds per acre is used. The control lasted may be used- These levels represent total coppe" However 5 at least 5 months, at which time the onset of cold weather the amount in solution is always much less the total made further observations meaningless. During the field trial, amount added because of the insoluble nature of the the areas surrounding the test plot remained infested with pounds. Some discoloration of the plant was obvious within 12 hours and there was extensive defoliation within 24 hours. Five days after treatment the stems had separated from the nodes an extensive discoloration of the plants was obvious. An untreated control plant showed new growth during the same period. The average depth of the pond was 2. An aqueous suspension containing 40 pounds of copper ll hydroxide in 40 gal. The particles of copper ll hydroxide settled through the water and came to rest on the weeds and algae. A general condition of chlorosis was apparent in all the treated plants within three days of the herbicide application, and the weeds and algae gradually disintegrated and disappeared during the next several weeks. The weeds and algae in the areas surrounding the trial area remained in a healthy condition. What is claimed is: A method of destroying undesirable aquatic plants in lakes, ponds, waterways, and the like, comprising applying only to the area infested with said plants, an herbicidally effective amount of a substantially insoluble copper-containing compound selected from the group consisting of copper ll carbonate, copper l oxide, copper ll oxide, copper ll benzoate, copper ll bicarbonate, copper ll hydroxide, copper l azide, and copper ll azide, said compound being in particulate form and only being effective when the particles contact said plants, said method substantially reducing the amount of copper compound in the surrounding aquatic environment thereby greatly minimizing the destruction of desirable aquatic life. A method as recited in claim 1 wherein said copper-containing compound is basic copper ll carbonate. A method as recited in claim 1 wherein said copper-containing compound is copper l oxide. A method as recited in claim I wherein said copper-containing compound is copper ll oxide. A method as recited in claim 1 wherein said copper-containing compound is copper ll benzoate. A method as recited in claim 1 wherein said copper-containing compound is copper ll bicarbonate. A method as recited in claim I wherein said copper-containing compound is copper ll hydroxide.

Chapter 4 : Algaecides & Herbicides | Lake and Pond Solutions Co. Store

Aquatic Algaecides for Lakes and Ponds. Algae are found in all salt and freshwaters worldwide. Although algae are very simple in their structure and sometimes consist only of a single cell floating in water, they are tremendously important for the health of our planet.

Chapter 5 : About Us | Aqua Services Lake & Pond Management

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Aquatic Herbicides & Algaecides Environmental Aquaitc Management(EAM) offers non-restricted aquatic herbicides, algaecides and dyes for sale. There has been a dramatic change in the laws that govern all aquatic applications of any product.

Chapter 6 : Algicides | Open Library

Commercial grade Herbicides and Algaecides to control weeds and algae in ponds and lakes.

Chapter 7 : Herbicides and Algaecides

Home; Herbicides & Algaecides; Herbicides & Algaecides. Looking to get rid of unsightly lake weeds, algae, and pond weeds? Weeders Digest can help you find an environmentally safe and responsible herbicide or algaecide solution for your nuisance problems.

Chapter 8 : Pond Treatments - Wisconsin Lake & Pond

Aquatic Products. Browse our full line of aquatic products, from aquatic herbicides and algaecides to water quality restoration and aquatic dyes.

Chapter 9 : Algaecides Archives - Pond & Water Management

Hydrothol Â® Granular Aquatic Algaecide & Herbicide is recommended for use against each of the weeds listed below. Click on your desired weed for more information and alternate control options. Click on your desired weed for more information and alternate control options.