

eliminating a necessary nutrient for algae to live, causing it to starve.

Technically, aluminum sulfate, when added to water, forms solid aluminum particles that sink to the bottom. The solid is reactive and phosphates stick to it. If pH of water is below 6 or on the acidic side, then the aluminum does not form a solid precipitate and remains free, which can be toxic to fish.

In contrast, pond keepers with lush marginal plant and lily growth methodically add plant tabs to each pot to feed their plants once or twice each month. These tablets have various percentages of Nitrogen, Phosphorus and Potassium, but most often the phosphorus is in greatest quantity, as it promotes root growth and blooming. If to control algae a product binds phosphorus, then it is likely going to also effect more than the target algae.

Beyond the products sold for pond use, there are innumerable products to control an equal number of so-called "pests" in the landscape. The term pesticide is a generic term for all the products used to suppress pests. Insecticides, similarly, are used to decrease undesirable insects, herbicides are used to control weeds and grasses, fungicides are used to control mildews and fungi, and rodenticides are used to control rodents.

Fertilizers are not thought of as being a pesticide, but can be a contaminant to water, causing increased ammonia levels which may affect fish. Too often, we assume that if a little bit does good, then a lot more will do better. This is not generally the case.

Pesticides and Ponds

The buzzword used for pest control today is "organic." There is a major misconception that "organic" means "safe." Two of the most commonly sold organic pesticides are pyrethrins and rotenone. Both of these products are HIGHLY toxic to fish.

Another product thought to be safe is Insecticidal Soap. If you read the label of Safer® brand Insecticidal Soap, it expressly states under Environmental Hazards: "This product may be hazardous to aquatic invertebrates Do not apply to water ..."

All products registered with the EPA are required to give you the applicator-specific information on their products. to safeguard you and the environment. This information is provided on

the label - read it thoroughly! Remember that you don't have to intentionally be using a product in the pond to have it become contaminated. Even in the stillest of air drift occurs. Run-off into the pond from the ground near a pond which is contaminated can flow into the pond in a heavy rain.

Pesticides can have several names. The common or generic name, this is the term used to refer to the chemical compound. This is frequently the name used in literature such as the MSDS, and lists the pesticide's toxicity and residual affects.

A pesticide also has a chemical name, which describes the molecule; this is not included in the table. Sometimes there can be more than one chemical name for a compound, depending on the conventions used to describe the molecule. The third name, the trade name, is what is generally used in advertising in magazines and brochures and the name on the product when you purchase it at the store. A pesticide may have several trade names when it is marketed in slightly different formulations and by different manufacturers.

There are no means to guarantee a chemical spill, run-off from a heavy rain, or a drift accident won't occur. If you plan to use a pesticide you can, and should, take extra precautions to decrease the likelihood of pond contamination. If it is feasible, cover the pond with a plastic drop cloth. Make sure there is no breeze; even the slightest amount can create drift. It is always a good idea, if you have neighbors who have a lawn service, to ask them to notify you when the service is going to be spraying.

ALWAYS read labels and follow directions on the product. "Signal" words on product labeling state the toxicity of the pesticide to humans. "DANGER— POISON!" signals it is highly-toxic, "WARNING!" moderately-toxic, "CAUTION!" slightly-toxic to relatively non-toxic. Remember, this is the toxicity level for humans, not fish or invertebrates in the pond. Read the fine print that specifies the environmental hazards.

Information compiled from *EXTOXNET ... Pesticide Information Profiles (PIPs)* EXTOXNET is a cooperative effort of University of California-Davis, Oregon State University, Michigan State University, Cornell University, and the University of Idaho. Primary files are maintained and archived at Oregon State University.

Pesticides and Ponds Don't Mix

by Cyndie Thomas
Colorado Water Garden Society
©Copyright 2005 All Rights Reserved

It is easy to encounter problems with your pond, primarily algae, and then turn to chemicals for a "quick fix." The outcome is not always positive, and may include fish deaths, plant decline and death with minimal control of the algae problem. It is not known if the products were a direct cause, but may have created other imbalances that caused the outcomes.

There are many products now on the market to treat algae, clear pond water, and even decrease sludge at the bottom of the pond. After attempting to research these products I found most of them do not list any active ingredients. They are not registered with the Environmental Protection Agency (EPA). Most state they are not harmful to plants or fish, IF used according to directions.

Only after obtaining a Material Safety and Data Sheet (MSDS) on algae control products did I finally find a clue to how they might actually control algae. Their claim is control through "clumping" the algae so it can be removed, either by a mechanical filter or by siphoning it off the bottom of the pond after it settles. Further research revealed that the primary chemical compound that provides this "clumping" is aluminum sulfate. Aluminum sulfate is alum - we find it in Maalox, pickles and septic sticks. In the pond it works by removing phosphorus, thus

Common/Generic Name	Trade Name	Used for	Environmental Hazards
2,4-D	Many products	Broadleaf weed control	Slightly toxic to wildfowl and slightly to Moderately toxic to birds. Some formulations of 2,4-D are highly toxic to fish
Dicamba	Many products	Weeds	Dicamba is practically nontoxic to birds. Dicamba is of low toxicity to fish. It poses little threat to wildlife. Dicamba is not toxic to bees.
Bacillus thuringiensis	Dipel, Bt, Mosquito Dunks	Control of lepidopterous larvae, mosquito larvae and some fly larvae	B.t. is not toxic to birds. B.t. is practically nontoxic to fish. It can be effective for up to 48 hours in water. Afterwards, it gradually settles out or adheres to suspended organic matter
Carbaryl	Sevin, Carbamate, etc.	Insecticide to control webworms, grubs, ants	Carbaryl is practically nontoxic to wild bird species. Carbaryl is moderately toxic to aquatic organisms. It is lethal to many non-target insects, including bees and beneficial insects. It is bound by organic matter and can be transported in soil runoff.
Diazinon	Spectracide, Knox-Out	Grubs, aphids, ants, crickets	Birds are quite susceptible to diazinon poisoning. Diazinon is highly toxic to fish. Life is 2 to 4 weeks in soil. Breakdown rate is dependent on the acidity of water. Highly acidic one half of the compound disappeared within 12 hours while in a neutral solution, the pesticide took 6 months to degrade to one half of the original concentration.
Glyphosate	Roundup	Nonselective systemic herbicide for control of annual and perennial plants including grasses, sedges, broad-leaved weeds, and woody plants.	Glyphosate is slightly toxic to wild birds. It is practically nontoxic to fish and may be slightly toxic to aquatic invertebrates. Low potential for runoff. Life in pond water ranges from 12 days to 10 weeks.
Malathion	Many products	Control of sucking and chewing insects on fruits and vegetables, and is also used control mosquitoes, flies, and household insects. Malathion may also be found in formulations with many other pesticides.	Malathion is moderately toxic to birds. Moderately toxic to fathead minnows and slightly toxic to goldfish. Malathion is highly toxic to aquatic invertebrates and to the aquatic stages of amphibians. Malathion will break down rapidly in sunlight, with a reported half-life in air of about 1.5 days. Breakdown in water reported to be 2.5-6 weeks using high concentrations.
Pyrethrins and Pyrethroids	Many Products	Pyrethrin compounds have been used primarily to control human lice, mosquitoes, cockroaches, beetles and flies. Also used for houseplant insect pests. It may also be found in formulations with many other pesticides.	Pyrethrin is extremely toxic to aquatic life, while it is slightly toxic to bird species, such as mallards. Toxicity increases with higher water temperatures and acidity. These compounds are toxic to bees. Pyrethrum compounds are broken down in water to nontoxic products. Pyrethrins are inactivated and decomposed by exposure to light and air.

Information compiled from EXTOWNET...*Pesticide Information Profiles (PIPs)* EXTOWNET is a cooperative effort of University of California-Davis, Oregon State University, Michigan State University, Cornell University, and the University of Idaho. Primary files are maintained and archived at Oregon State University.

