Lake Notes

Fertilizers and Pesticides

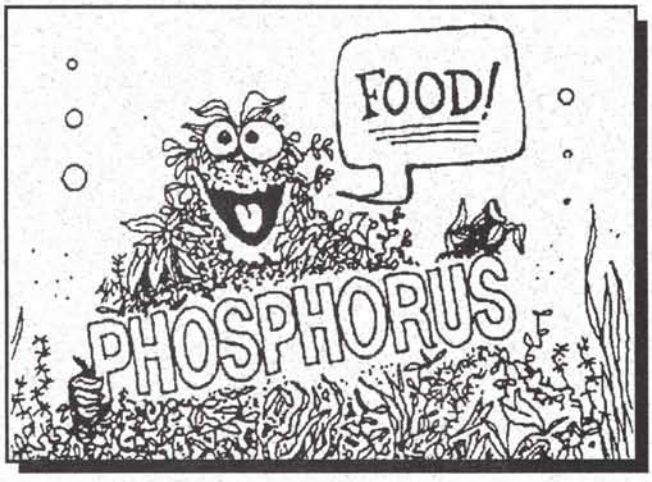
Options for Lawn and Garden Use

Fertilizers and their Nutrients

Did you know that the nutrients which feed your yard's grass, trees, shrubs, and flowers are the same as those that help algae and other aquatic plants grow in your lake? That's why it's important to avoid over-fertilizing your lawn and garden areas by knowing their nutrient needs and when it's best to apply fertilizers.

The three primary plant nutrients essential for growth are nitrogen, phosphorus, and potassium. Fertilizers can be purchased as "single ingredient" fertilizers (such as ammonium nitrate and urea for nitrogen, triple super phosphate for phosphorus, and muriate of potash for potassium). "Combination" fertilizers such as 8-8-8 or 25-10-5 contain all three nutrients. The three numbers indicate the percentage of each nutrient in the fertilizer. For example, a 10-6-4 fertilizer contains 10 percent nitrogen, 6 percent phosphorus, and 4 percent potassium.

Fertilizers are available in dry and liquid forms. They also can be classified by their solubility. Soluble fertilizers (all liquid and some dry formulations) release their nutrients rapidly, whereas slow-release and organic fertilizers (some dry formulations) release nutrients over a period of time. Following the application of a soluble fertilizer, plants may not be able to take up all the available nutrients, and some of the nutrients may leach below the plant rooting depth with percolating water. Since water "runs downhill" even under the land surface, these leached nutrients may be transported into the nearest lake or stream. Slow-release fertilizers, on the other hand, are designed to release nutrients at a rate more in line with plant needs. This means there is less likelihood that nutrients will leach below the plant rooting depth and be carried with subsurface water toward your lake.



Phosphorus is a nutrient that boosts plant and algae growth in your lake!

Turfgrasses are most responsive to nitrogen applications, assuming that adequate levels of the other essential nutrients are present. To find out what your lawn really needs, do a soil test. Soil test information packets are available from your local University of Illinois–Cooperative Extension Service office. Follow the simple directions to collect and send in your soil sample (a nominal fee is charged for the analysis). A soil test will tell you the levels of available phosphorus and potassium in the soil as well as the soil pH (because nitrogen is so soluble, it's not practical to test for it). A fertilizer recommendation will be included in your soil test results. If levels of phosphorus and/or potassium are sufficient, there is no need to apply those nutrients. In fact, many

studies have shown that lawns in the Midwest rarely need phosphorus. If you're located near a farmers cooperative, check with them for no- or low-phosphorus fertilizers. Otherwise, contact Illinois EPA's Lakes Program staff at 217/782-3362. Consider ordering fertilizer as a lake association or neighborhood group—you may be able to get a quantity discount. Remember too that grass clippings contain the nutrients your lawn needs to grow. A garbage bag of clippings contains up to 1/4 pound of usable organic nitrogen. Over the growing season, grass clippings can provide up to 50% of the nitrogen needed by your lawn. Hence, you can reduce your fertilizer costs by mulching grass clippings back into the lawn.

The rate and timing of fertilizer applications are very important in maintaining a vigorous and healthy turf–as well as keeping the nutrients on your lawn and not in the lake. Apply only the amount specified, and water your lawn immediately after application. Never apply fertilizers if rain is forecast: you can control your sprinkler but not the weather! Use a calibrated spreader to ensure uniform distribution and help prevent over-application.

The best time to apply fertilizer is in the fall, ***not*** in the spring. Spring applications can actually harm lawns by promoting more leaf growth than root growth. This can lead to shallow root systems that are unable to sustain lawns through a drought or harsh winter. Fall applications, on the other hand, promote deep, healthy root systems and hardy lawns. Apply fertilizer in the fall after the average daily temperature drops to 50°F for a week or so (usually in October). To calculate the average daily temperature, add the daily high temperature to the daily low temperature and divide by two. For example, 61° (daily high) + 37° (daily low) ÷ 2 = 49° (average daily temperature).

Trees, shrubs, flowers, and vegetable gardens all require differing amounts of fertilizer nutrients under different circumstances. In fact, healthy trees and shrubs don't even require annual fertilization. Contact your local nursery, Cooperative Extension Service office, or Soil & Water Conservation District for recommendations.

Pesticides

Pesticides are chemicals intended to kill or repel pests, and include herbicides, insecticides, fungicides, and rodenticides. Pesticides are poisons and can pose a threat to humans (especially the person applying them) as well as plants, animals, and other non-target species such as insects and fish.

Everything applied to your yard has the potential to contaminate ground and surface waters. This is particularly true for lakeshore homes. Pesticide residues can contaminate freshwater ecosystems for generations. The breakdown products produced as pesticides decompose can be more toxic and affect more organisms than the original pesticide.

Many pesticides also can be "bio-accumulated." Bio-accumulation is a process whereby a contaminant concentrates in each link of the food chain, thus reaching greater concentrations at each higher level in the food chain. It is this bio-accumulation effect that led to breeding failures in eagles and other fish-eating birds in the late 1960s and consequently led to the banning of DDT. All of our prized gamefish are top predators and thus are in a position to be affected by pesticide bio-accumulation.

Integrated Pest Management

Integrated Pest Management (IPM) is an ecological approach to pest management that integrates cultural, mechanical, biological, and chemical control methods. IPM stresses learning about the relationships between plants and their pests and using this knowledge to manage insect problems. Under the IPM approach, plants are selected that can naturally defend themselves or other plants, and insect predation is tolerated up to the level at which it begins to harm the plant (most plants can tolerate a considerable amount of insect feeding without suffering serious damage). Chemical control strategies are used only as a last resort.

Cultural controls work by creating optimal conditions for plants, while at the same time creating unfavorable conditions for pests.

- ☑ Choose native, disease-resistant plant varieties suited to your conditions to minimize the need for pesticides. Healthy plants are more effective at defending themselves against insects and competition.
- ☑ Rotate annual plants in your gardens to disrupt the life cycle of plant-specific pests.
- ☑ Remove pest-infested plant residues in the fall.
- ☑ Plant a wide variety of plant species to reduce potential pest problems.
- ☑ Maintain optimal light and water levels for plants (mulch can help maintain soil moisture throughout the growing season and reduce the need for watering). Stress weakens plants' natural resistance.
- ☑ Proper mowing heights are important for maintaining healthy turfgrass. Set your mower to cut at 2 to 2½ inches. Mow often, each time the grass reaches 3 to 4 inches high (it's important not to cut more than 1/3 of its height in any one cutting). Longer lawns are healthier, more drought-resistant, and will discourage growth of many common weeds!

Biological controls take advantage of natural predator/prey or host/parasite relationships to control pest insect populations.

- ☑ Limit pesticide use to allow natural enemies to thrive, helping to keep pest populations in check. Beneficial insect predators include ladybird beetles, ground beetles, praying mantises, and dragonflies that consume many pests in their lifetime. Parasites, such as the trichogamma wasp, will generally consume one individual insect pest during its own lifetime. There are also pathogens, such as fungi and bacteria, that infect insect pests (but do not pose a threat to humans).
- ☑ Entice insect-eating birds and/or bats to your yard by providing suitable habitat such as purple martin houses or bat houses.

Mechanical controls use physical disturbance to remove pests.

- ☑ Till or hand-weed instead of using herbicides.
- ☑ Remove large insects by hand.
- ☑ Use mulch to cut down weed growth, reduce erosion, and retain soil moisture.

Chemical controls include natural and synthetic pesticides.

- ☑ Use lawn and garden chemicals carefully and sparingly. Pesticides should be considered a last resort after other controls have failed.
- ☑ Use pest-specific pesticides whenever possible– that is, a pesticide designed to kill **only** the insects, weed, or plant disease organisms causing the damage.
- ☑ Use the least toxic pesticide that will do the job. For example, inorganic insecticides such as some oils and soaps kill pests on contact while posing little threat to the environment. Microbial insecticides (derived from microorganisms) also are less toxic. Keep in mind that botanical pesticides (derived from plants) are not necessarily less toxic than synthetic pesticides; however, they are short-lived and break down quickly in the environment. Pesticides with the word "caution" on their label are less toxic than those labeled "warning" or "danger."

Guidelines for Pesticide Use

When pests invade lawns and gardens, consider the full range of Integrated Pest Management options. If you decide you must use a pesticide, follow the label directions carefully. In addition, the following guidelines will help minimize risk to you and the surrounding environment–and help protect your lake.

- ☑ Read the label carefully. The label will tell you when, where, and how to apply the product. Label usage instructions have the force of law: you can be held liable for improper use.
- ☑ Make sure the pesticide is designated for use on the pest you want to control.
- ☑ Never apply pesticides near wells, surface waters, or wetlands unless the label specifically allows for such applications.
- ☑ Never apply pesticides to bare ground. Eroding soil will carry pesticides with it.
- ☑ Never pour pesticides into toilets, storm drains, or ditches. Read the label to determine proper disposal methods.
- ☑ Dispose of extra or old pesticides through the Illinois EPA's Household Hazardous Waste Collection Program when it visits a community near you.
- ☑ Keep pesticides in their original containers so you know what they are and how to use them. Store them in a dry place away from childrens' reach.
- ☑ Do not apply pesticides if rain is forecast unless specified on the label. Some pesticides need to be watered-in, but others will be washed off, decreasing their effectiveness and contaminating lakes and streams.

- ☑ Never spray pesticides on a windy day. Wind will carry the pesticide away from its target area and may unintentionally impact beneficial insects, birds, or other wildlife.
- ☑ Do not mix pesticides unless instructed to by the product directions.
- ☑ In the event of a small pesticide spill, do *not* hose down the area with water. Wearing rubber gloves, sprinkle absorbent material (e.g., sawdust or kitty litter) over the spill, transfer the material into a sturdy plastic bag, close tightly, and store in a safe place until it can be transferred to a hazardous waste collection site.
- ☑ Wear protective clothing as instructed on the label. Wash pesticide-contaminated clothing alone, never with other clothing.

Lake Notes . . . is a series of publications produced by the Illinois Environmental Protection Agency about issues confronting Illinois' lake resources. The objective of these publications is to provide lake and watershed residents with a greater understanding of environmental cause-and-effect relationships, and actions we all can take to protect our lakes.

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For more information about other publications in this series and to request copies, please contact: Illinois Environmental Protection Agency, DWPC-Lake and Watershed Unit, P.O. Box 19276, Springfield, Illinois, 62794-9276; 217/782-3362.

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