



Lawn & Garden Fertilizers

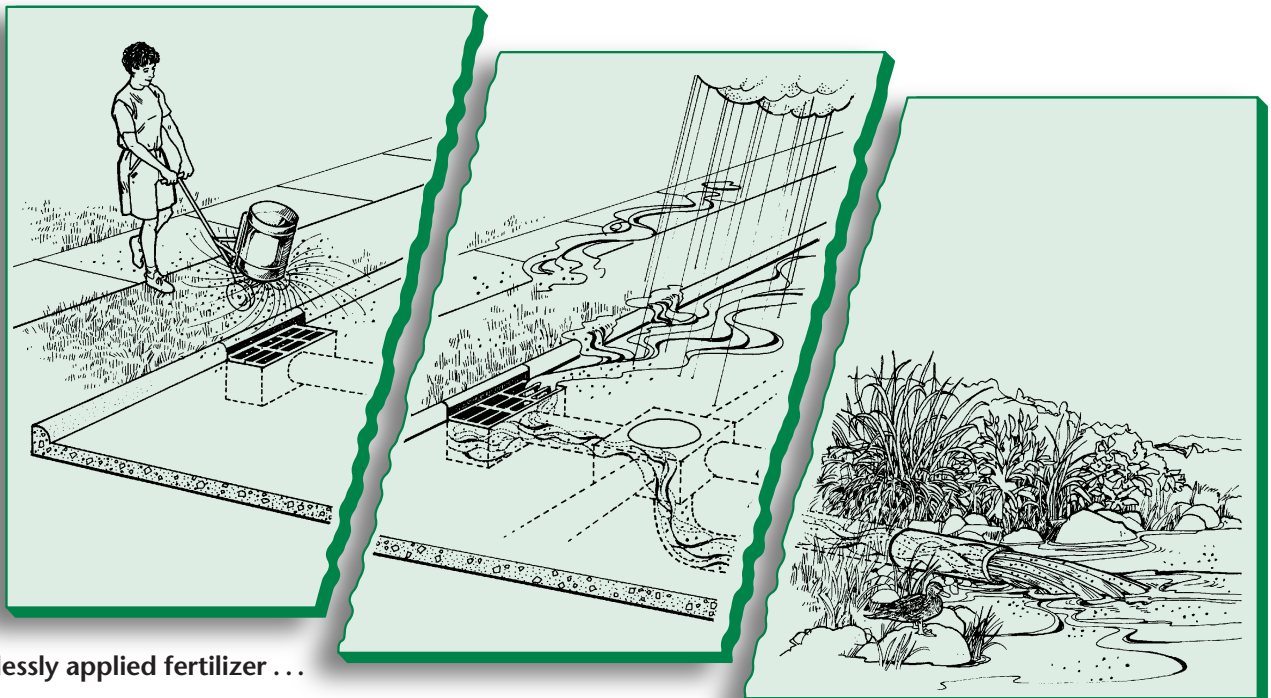
A SERIES OF WATER QUALITY FACT SHEETS FOR RESIDENTIAL AREAS

Healthy lawns, trees and shrubs add to the beauty and value of a home. They also keep our lakes and streams clean by allowing rainwater to filter into the soil rather than running into storm sewers. Maintaining healthy lawns and landscape plants, however, often requires the use of fertilizers and improper fertilizer use can cause water pollution.

Many fertilizer materials, including leaves and grass clippings, contain nitrogen and phosphorus. When these nutrients wash into lakes and streams they:

- promote unsightly algae blooms and aquatic weed growth,
- lower dissolved oxygen levels in the water, and
- may release ammonia – which is toxic to fish.

This publication describes fertilizer practices that will help maintain healthy lawns and gardens, while protecting water quality in your community.



Carelessly applied fertilizer ...

... washes into storm sewers ...

... and flows directly into our lakes and streams.

It all adds up

Fertilizer carelessly applied on one lawn can be a waste of the homeowner's money but may otherwise seem insignificant. On hundreds or thousands of lawns, however, careless applications can add up to a major problem for local streams and lakes. For tips on efficient fertilizing, see inside ...

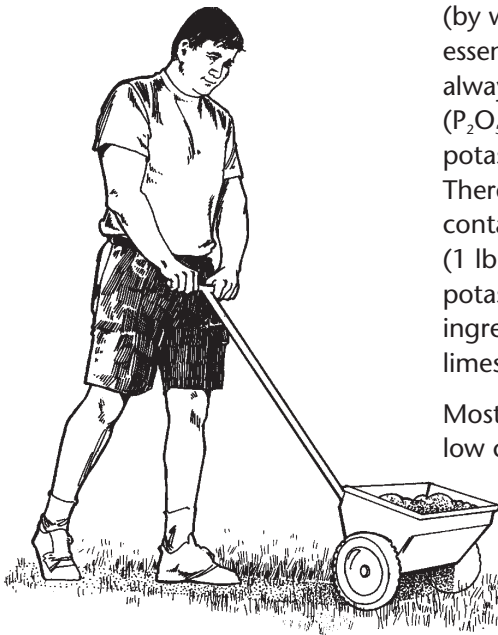
CHOOSING THE BEST FERTILIZER APPROACH

FERTILIZER SELECTION

The label on a fertilizer bag has three numbers indicating the percentage (by weight) of the three nutrients most essential to healthy lawns. Nitrogen (N) is always listed first, followed by phosphate (P_2O_5), which supplies phosphorus, and potash (K_2O), which supplies potassium. Therefore, a 25 lb. bag of 25-4-5 fertilizer contains 25% (6.25 lbs.) nitrogen, 4% (1 lb.) phosphate, and 5% (1.24 lbs.) potash. The remainder is made of ingredients such as sand or ground limestone.

Most organic fertilizers contain relatively low concentrations of plant nutrients compared to synthetic fertilizers, and release nutrients more slowly. Slow-release fertilizers provide a lower concentration of nutrients over a longer period of time. Fast-release fertilizers do the opposite.

On heavy (clay) or compacted soils, fast release fertilizers are better than slow-release fertilizers. The longer a fertilizer granule remains undissolved, the greater the chances of it being washed into waterways. On sandy soils, however, nitrogen can leach through the soil into the groundwater. On these soils, slow release nitrogen is preferred. Slow release nitrogen sources provide soluble nitrogen over a period of time so there is not a large concentration of nitrogen available for leaching.



It's best to test the soil before you start a fertilization program. For more information on soil testing, contact your county UW-Extension office.

SOIL TESTS

A fertilization program should begin with a soil test. Soil tests provide specific fertilizer recommendations for your lawn and garden and can help you avoid over-application of fertilizer.

LAWN FERTILIZERS

A lawn fertilization program should begin in **early October**, not early May. Spring applications can actually harm lawns by promoting more top (leaf) growth than root growth. Shallow root systems are unable to sustain lawns through a drought or a harsh winter. Fall fertilizer applications, however, promote deep, healthy root systems and hardy lawns.

Fall fertilizer applications should be made when the average daily temperature drops to 50° F. The average daily temperature is determined by adding the daily high temperature and the daily low temperature, and dividing by two. For example, 61° F (daily high) + 37° F (daily low) divided by 2 = 49° F average daily temperature.

The table below shows the timing of fertilizer applications and recommended amounts (if a soil test report is not available). It also shows the importance of grass clippings. By leaving grass clippings on the lawn, nitrogen applications can be reduced by 30-40 percent. Keep in mind that over-fertilizing and poor timing – not grass clippings – are primary reasons for thatch problems in lawns.

Nitrogen application guidelines

Time of Application ¹	Pounds of nitrogen per 1,000 square feet of lawn	
	Grass Clippings Removed	Grass Clippings Not Removed ²
October 1	1.25	1.00
Late May	1.25	1.00
Late June	0.75	0.50
Late August (optional)	0.75	0.50

¹Fall nitrogen fertilizers should be water soluble and contain nitrate or ammonia forms of nitrogen such as urea, ammonium nitrate or ammonium sulfate.

²Grass clippings are organic fertilizers containing 3-4% nitrogen when dry.

Note: You can use a simple calculation to determine how much fertilizer to apply to reach a recommended level of nitrogen. For example, if you want to apply 1.00 lb. of nitrogen using 25-4-5 fertilizer, divide 1.00 by 25 percent (or .25). The answer is 4. In this case, to get the recommended 1.00 pound of nitrogen, apply 4 lbs. of the fertilizer mixture per 1,000 sq. ft. of lawn. (Of course, you also need to determine the size of the lawn.)

GARDENS, TREES & SHRUBS

Start with a soil test. The nutrient requirements for garden plants vary. In general, nitrogen promotes leafy top growth; phosphorus is used for root development; and potassium is necessary for winter hardiness, disease resistance, and general plant durability. Specific recommendations can be found in publications available at your county UW-Extension office.

Healthy trees and shrubs in well-drained, fertile soils do not require annual fertilizer applications. If they appear unhealthy, the problem may be caused by insects, disease, or weather. Fertilizers should be applied when trees and shrubs are growing poorly and the problem cannot be traced to other causes. If plants do not respond, the problem may be soil-related.

In general, trees and shrubs should be fertilized when they are dormant, in late fall or early spring. Fertilizing in early fall stimulates growth that might be killed in winter, providing an entrance for insects and disease organisms. Similarly, fertilizing in late spring stimulates growth that depletes stored food supplies and weakens the plant. (However, if trees and shrubs are stressed by environmental conditions, fertilizer should be applied in June.)

When planting gardens, trees or shrubs, cover the bare soil with a mulch to prevent erosion, and sweep (don't wash) soil off paved areas. Phosphorus is often attached to soil particles. When these particles are washed into lakes or streams the phosphorus stimulates excess weed and algae growth.



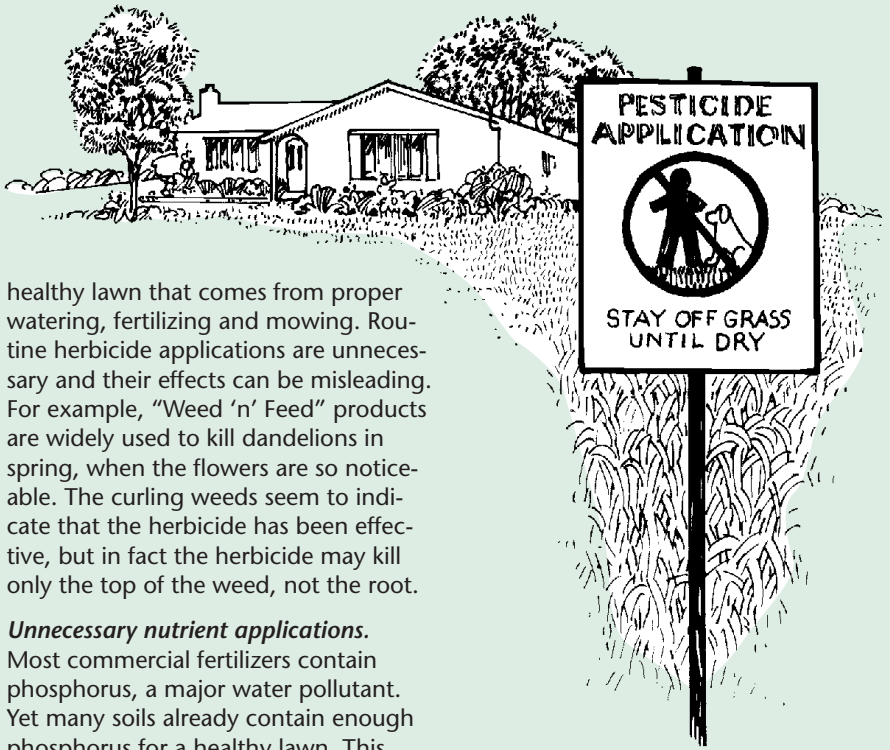
Healthy gardens, trees and shrubs add beauty and value to a home, allow stormwater to soak into the ground and help filter impurities from the water.

A Note of Caution on Fertilizer-Pesticide Combinations

Many homeowners and lawn care companies routinely combine fertilizer and pesticides in a series of applications throughout the spring, summer and fall. These multi-step programs are promoted as the sure and easy path to the perfect lawn. The pressure to have a perfect lawn, however, has clouded a number of issues and literally mixed ingredients that should be kept separate. Areas of caution include:

Routine insecticide applications. Most insects found on a lawn are beneficial, and insecticides can harm these beneficial insects, as well as birds, pets and people. Research in Wisconsin indicates that only about one lawn in 200 will need an insecticide application in a given year. Even on lawns where harmful insects exist, natural controls or better lawn care practices will reduce the threat. For example, chinch bugs can be pests during a dry year, but proper watering (or even a good rain) can minimize their effects.

Routine herbicide applications. Weeds are not the cause of an unhealthy lawn, they are the result. The best defense against weeds is a thick



healthy lawn that comes from proper watering, fertilizing and mowing. Routine herbicide applications are unnecessary and their effects can be misleading. For example, "Weed 'n' Feed" products are widely used to kill dandelions in spring, when the flowers are so noticeable. The curling weeds seem to indicate that the herbicide has been effective, but in fact the herbicide may kill only the top of the weed, not the root.

Unnecessary nutrient applications. Most commercial fertilizers contain phosphorus, a major water pollutant. Yet many soils already contain enough phosphorus for a healthy lawn. This underscores the need for a soil test before applying fertilizers. Low-phosphorus or phosphorus-free fertilizers can provide nutrients while avoiding the threat to water quality.

In short, applying unneeded pesticides and nutrients in a generic, multi-step fertilizer program can be expensive for the homeowner and harmful to the environment.

FERTILIZING FOR HEALTHY PLANTS AND CLEAN WATER

A good fertilization program promotes healthy plants that are more resistant to drought, insects and diseases. Healthy plants can also out-compete weeds and filter pollutants carried by runoff water. Indiscriminate use of fertilizers, however, can damage plants and pollute lakes and streams. To maintain a healthy lawn and garden and protect our water resources, remember:

- **Test the soil.**

Before planting a garden or fertilizing your lawn, have the soil tested. A soil test takes the guesswork out of fertilization.

- **Fertilize lawns in the fall.**

Fall fertilization promotes healthy lawns with deep roots.

- **Healthy trees and shrubs do not require an annual fertilizer application.**

Overfertilized shrubs, in fact, will produce more growth and require more pruning.

- **Sweep all fertilizers, soil, and vegetation off paved surfaces.**

Fertilizers, soil particles, grass clippings and leaves contain nitrogen and phosphorus which can cause nuisance weed and algae growth if washed through storm sewers into nearby waterways. In addition, decomposing leaves and grass clippings can rob streams and lakes of oxygen.

- **Contact your county UW-Extension office.**

Soil testing information and fertilizer recommendations for lawns and gardens, and suggestions for selecting the right plants, are available at your county UW-Extension office.



This publication is available from county UW-Extension offices or from Extension Publications, 630 W. Mifflin St., Madison, WI 53703. (608) 262-3346.

A publication of the University of Wisconsin–Extension in cooperation with the Wisconsin Department of Natural Resources.

Authors: Gary Korb and James Hovland, UW-Extension, and Steven Bennett.

Illustrations: Carol Watkins

©1999 by the Board of Regents of the University of Wisconsin System. Send inquiries about copyright permission to: Director, Cooperative Extension Publications, 201 Hiram Smith Hall, 1545 Observatory Dr., Madison, WI 53706. University of Wisconsin-Extension is an EEO/Affirmative Action employer and provides equal opportunities in employment and programming, including Title IX and ADA requirements.

Editing and design by the Environmental Resources Center, University of Wisconsin–Extension.



Printed on recycled paper

GWQ002 Lawn & Garden Fertilizers

DNR WT-528-99

R-09-99-10M-30-S

UW Extension

