

Homeowner's GUIDE



To Fertilizing Your Lawn and Garden

XCM-222

We all want a home landscape that is attractive – but did you know that some of our common landscape management practices can cause pollution? The improper use of lawn fertilizers has the potential to harm our water supplies and our environment.

Have you ever noticed a pond that was overgrown with weeds or algae? Chances are it received an excess of nutrients – perhaps from urban runoff from lawns or gardens. Drinking supplies may become contaminated the same way when nitrogen in fertilizer becomes nitrate. In severe cases, this contamination can even cause health problems.

Your yard can have a positive effect on water quality by slowing down and filtering runoff water, or it can contribute to water quality problems. It all depends on how you manage water, chemicals, and the landscape around your home. Fertilizer carelessly applied on one lawn may seem insignificant. On hundreds or even thousands of lawns it can add up to polluted streams, lakes, and even groundwater.

What Can You Do to Protect Water Quality?

- Fertilize your lawn and garden properly.
- Water only when needed.
- Use low maintenance landscaping.
- Maintain a healthy lawn.

Fertilizing Your Lawn for Healthy Plants and Clean Water

An effective lawn fertilization program actually starts in early fall, not in the spring. Spring applications alone may promote excessive top growth, leaving shallow root systems that poorly sustain lawns during hot dry spells or harsh winters. Fall fertilizer applications on established grass promotes healthy root systems and hardy lawns.

One way to know how much fertilizer to apply is to take a soil test. If an analysis is not feasible, Table 1 shows the proper timing and amounts for various lawn types common in Colorado. The table assumes that all lawn clippings are left on the lawn to be recycled naturally. Keep in mind that over-fertilizing and other poor cultural practices are the primary reasons for thatch buildup, not grass clippings.



Selecting a Fertilizer

The label on all fertilizer bags contains three numbers that describe the amount of nitrogen (N), phosphate (P_2O_5), and potash (K_2O). For example, a 40 pound bag of 20-10-5 fertilizer contains 20 percent (8 pounds) nitrogen, 10 percent (4 pounds) phosphate, and 5 percent (2 pounds) potash.

Colorado State University
Extension

The remainder of the ingredients are fertilizer carriers such as sand or ground limestone, and sometimes micro-nutrients or an herbicide for weed control. Plants do not distinguish between nutrients supplied by granular, liquid or organic fertilizers. Select a lawn fertilizer based on nutrient analysis, convenience and price. Slow release fertilizers contain nutrients in a form that become available to plants throughout the growing season. This is advantageous because fewer applications are required and leaching losses are less likely. Avoid fertilizers that contain post-emergence herbicides for broadleaf weed control. Instead, spot spray or pull weeds in trouble spots.

Most established Colorado lawns will have adequate phosphorus (P) and potassium (K) in the soil without additional P and K fertilizer. If you apply a typical blended fertilizer based on N needs, you will usually apply more P and K than most lawns require. Avoid fertilizers containing P when your lawn is near streams, lakes or has steep slopes.

Determining How Much to Buy

Determine how much fertilizer you need before you make a purchase to avoid storing leftover materials. Measure the area of your lawn to get an idea how many square feet you have to fertilize. Read the fertilizer bag to determine how much nitrogen is in the bag. For example, if you want 1 pound of N per 1,000 square feet from a 46-0-0 product, you need to

apply 9 pounds of fertilizer on a 4,000 square foot lawn (see Table 1.) Fertilizer applied above the recommended rate is wasted money and potentially harmful to water resources and aquatic life. Excess fertilizer also overstimulates lawn top growth, requiring more frequent mowing.



Table 1. Pounds of fertilizer required for various lawn sizes using a 1 pound N/ 1,000 sq. ft. application.

Square feet of lawn	----- % nitrogen (N) on label -----						
	5	10	15	20	25	34	46
	Fertilizer required for 1 lb. N/1,000 sq. ft. rate						
	----- Pounds -----						
2000	40	20	13	10	8	6	4
4000	80	40	27	20	16	12	9
6000	120	60	40	30	24	18	13
8000	160	80	53	40	32	24	17
10,000	200	100	67	50	40	29	22

Table 2. Recommended nitrogen fertilizer schedule where clippings are not collected.

Fertilizer Application Schedule for Established Colorado Lawns					
Grass Type	mid-March to April ¹	May to mid-June	July to early August	Mid-August to mid-September	Early Oct. to early November (when grass is still green) ²
(pounds of nitrogen per 1000 square feet of lawn)					
Low-maintenance Blue grass/ Ryegrass ³	½	½	Not required	1	1 (optional)
Turf-Type Tall Fescue	½	½ -1	Not required	1	1 (optional)
Fine Fescue	½	½ -1	Not required	½-1	Not required
Buffalograss/ Blue Grama/ Bermudagrass	Apply <u>no</u> N	½-1	½-1	Apply <u>no</u> N	Apply <u>no</u> N

¹The March-April nitrogen application may not be necessary if you fertilized late the previous year (Sept. to Nov.). If spring green-up and growth is satisfactory, delay fertilizing until May or June.

²On sandy soils, do not fertilize after late September. Winter precipitation can cause nitrogen to leach into ground-water. Slow release fertilizers, such as sulfur-coated, IBSU and natural, organic-based fertilizers are recommended on sandy soils to prevent leaching losses.

³High maintenance bluegrass lawns with heavy use may benefit from an additional ½ for each spring application.

Applying Lawn Fertilizer

Most garden stores have spreaders that are calibrated for their products. The directions on the fertilizer bag usually tell where to set the applicator as well.

If you are not sure where to set the spreader, put it on a “low” setting to avoid over-fertilizing. Go back over the lawn at a right angle to the first application if you did not get enough on the first pass. This will insure a more uniform application. Be sure to sweep up fertilizer that landed on sidewalks and driveways onto the lawn afterwards.



Excess fertilizer nutrients from lawn and garden runoff can cause overgrowth of aquatic weeds and algae, degrading fish and wildlife habitat and recreation opportunities.

Commercial Tree and Lawn Care Companies

If all of this sounds too complicated, you may want to consider using the service of a professional company to maintain your landscape. A reputable service offers licensed applicators who are trained to handle and apply chemicals properly.

Some areas of consumer caution should be noted.

- **Do you really need the “perfect lawn”** provided in a “full service” lawn care package? A low maintenance program might be more suitable.
- **Are routine insecticide applications desirable?** The vast majority of the insects found in Colorado lawns are neutral or beneficial – lawn insecticides are only occasionally needed under our conditions.

- **Are routine herbicide applications needed?** Weeds are not the cause of an unhealthy lawn; they are the result. In many cases, an attractive lawn can be maintained with sound watering, fertilizing, mowing, and aeration.
- **Are all of those fertilizer nutrients necessary?** Most commercial fertilizers contain phosphorous (a potential water pollutant) even though in many cases it is already adequately supplied in your soil. Consider a soil test before applying fertilizer nutrients besides nitrogen.

In short, a “one size fits all” lawn program may not be best for you or the environment. Question the blanket use of chemicals in favor of a more tailored program.

Fertilizing Landscape and Garden Plants

Nutrient requirements for garden plants can vary considerably. In general, nitrogen promotes leafy top growth; phosphorous is needed for good root development; and potassium is necessary for winter hardiness, disease resistance, and general plant health.

Always improve the soil prior to planting with a good organic soil amendment such as aged manure or compost to develop a rich, well-drained soil. If plants show yellowing leaves, consult your county Extension office or Master Gardener for nutrient recommendations. Iron deficiency may cause yellow landscape plants in Colorado.

Most established trees and shrubs planted in well-drained, fertile soils do not need annual fertilizer applications. However, if plants are growing poorly and you cannot identify a specific pest or weather related reason, a nutrient deficiency may be the problem.

The easiest and most economical method of fertilizing is to sprinkle a balanced liquid or granular fertilizer material under the plant and water it in. Mulching will help conserve moisture, protect roots, and prevent the loss of soil and nutrients.

Vegetable gardens are a great place to incorporate composted waste materials from your kitchen and garden. Aged or composted animal manures are also a good way to improve garden soils.

Some vegetables, such as corn or tomatoes, may benefit from the addition of a low analysis, complete

mineral fertilizer (such as 5-10-5) added at the rate of approximately 10 to 20 pounds of material per 1,000 square feet of garden. Corn requires more N than tomatoes. Fruit production can be delayed if too much N is applied to tomatoes. See fact sheet no. 7.611, *Fertilizing the Vegetable Garden* for more information on garden fertilization.

Maintaining a Healthy Lawn

When grass is dense and vigorous, it competes effectively against most pests. A sound watering and fertilization program is basic for a healthy lawn.

Other things you can do include:

- When installing new or replacement sod, prepare your soil well with deep tillage and compost amendments.
- Maintain a mowing height at 2 ½ to 3 inches. This encourages deeper rooting and heat resistance.
- Mow often enough so that you can mulch grass clippings on the lawn. This will recycle nutrients; it does not cause thatch.
- Core aerate your lawn at least once a year to encourage good rooting and water penetration.
- Keep your mower blade sharpened to avoid ragged cutting that increases moisture loss and stress.

Watering Your Yard

Poor watering practices are probably responsible for more landscape problems in Colorado than any other single factor, except maybe our weather. Over-watering causes the loss of nutrients to the environment and is not particularly good for most landscape plants. Still, different plant needs and soil types make it difficult to make precise watering recommendations.

In general, a sandy soil should receive ½ to 1 inch of water per application, while a clay soil should receive less frequent and gradual applications of 1 to 1 ½ inches of water. A dense stand of Kentucky blue grass may need up to 2 inches of water per week during the hottest part of the summer, but other grasses such as tall fescue may thrive on less if they have well-developed roots.

Over-watering is wasteful and can transport contaminants via runoff from the soil surface or percolation below the root zone. Homeowners with automatic sprinkler systems need to pay attention to weather patterns and their landscape's water needs. Turn off or reset sprinklers after rain or during periods of cool weather (see fact sheet 7.239, *Operating and Maintaining a Home Irrigation System*).

Low Maintenance Landscapes

You can make a positive impact by designing your landscape with plants that require less water and fertilizer, and have fewer pest problems.

Alternatives to Kentucky blue grass, such as buffalograss, blue grama grass, and turf-type fescue can provide a beautiful lawn that requires fewer resources. However, be aware that each alternative grass has its own advantages, disadvantages and maintenance needs. Often, homeowners plant grass in areas that are too shady, or that have steep slopes or poor soils where lawn grass just doesn't grow well. More fertilizer and water are not the answers in these cases. It's usually best to replace this grass with hardy ground covers, ornamental bunch grasses or mulch.



A yard under xeriscape can be maintained with less water and fertilizer in many situations. (Design/photo by Grant Reid.)

Xeriscape or low maintenance landscape plants are less dependent on fertilizer and water inputs. Additionally, they help attract song birds, butterflies and beneficial insects. Check with your local nursery or Extension county office to get more information on Xeriscapes (see fact sheets 7.228, *Creative Landscaping*; 7.230, *Xeriscaping: Ground Cover Plants*; and 7.243, *Sustainable Landscaping* and low input landscapes).

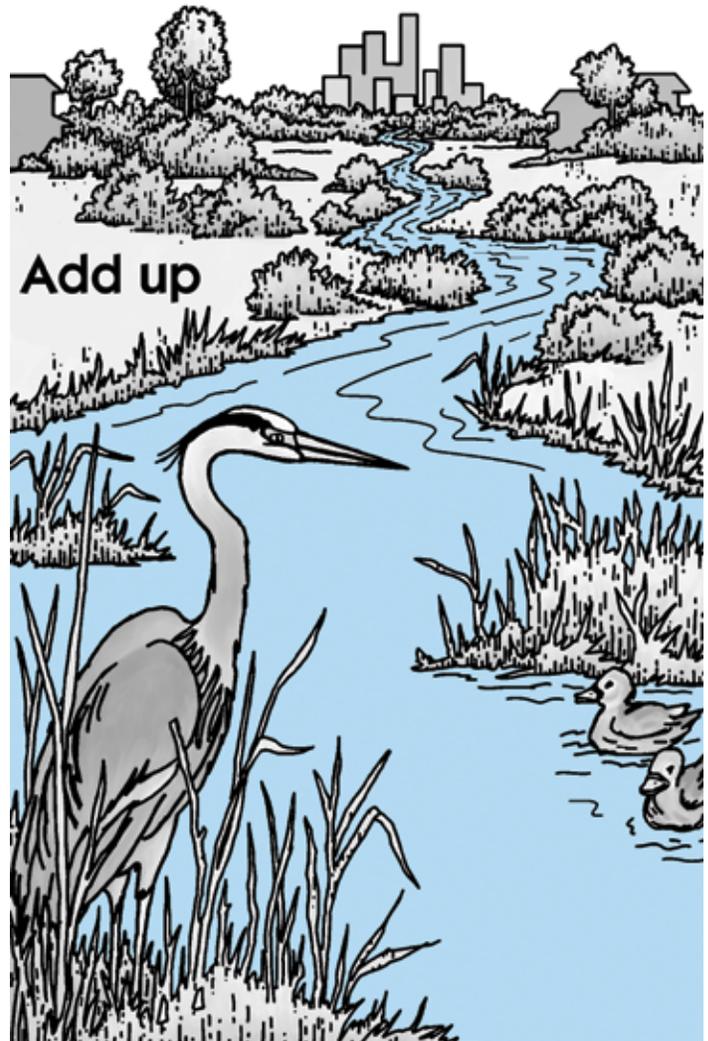
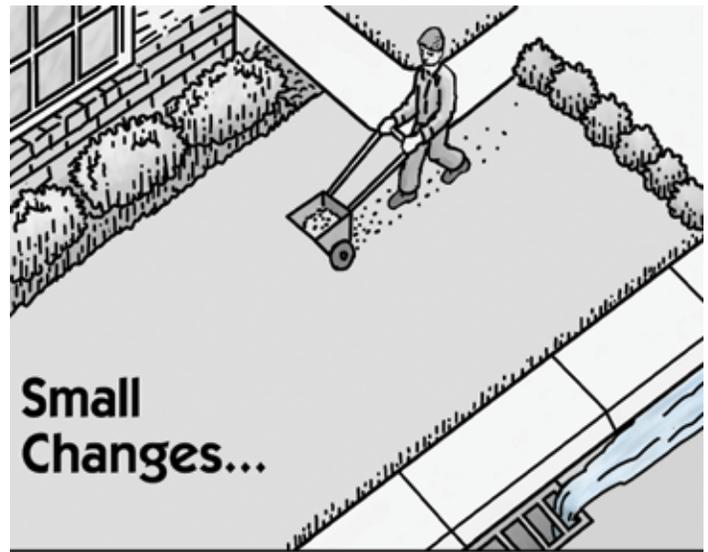
Finally, landscapes designed to hold rain and snow melt are environmentally friendly because they result in less water runoff. Keeping any part of your property that borders surface water in a dense natural vegetation can help filter out chemicals that might be carried in runoff water.

Simple Things You Can Do To Protect Water Quality

- Redirect downspouts to vegetated areas.
- Select landscape plants that are well adapted to your site and have low water requirements.
- Mow your grass high and often so that clippings and their nutrients can be recycled.
- Water your lawn on an “as needed” basis, rather than on a pre-set schedule.
- Adjust sprinklers to avoid watering paved areas.
- Use slow release forms of fertilizer.
- Treat specific weedy areas rather than resorting to general ‘weed and feed’ mixtures.
- Use only the amount of fertilizer or compost that is recommended. More is NOT better.
- Keep fertilizers and pesticides off sidewalks and driveways.
- Wash off fertilizer application equipment on the lawn, not on the sidewalk or driveway.
- Maintain natural buffer areas where no chemicals are applied between your property and any stream, lake or drainage way.

A well-managed landscape can be part of the solution instead of contributing to water quality problems. For more information on protecting water quality and the environment, please see the other Homeowner’s Guides in this series:

- Water Conservation (XCM-119)
- Pesticide Use Around the Home and Garden (XCM-220)
- Alternative Pest Management for the Lawn and Garden (XCM-221)
- Protecting Water Quality and the Environment (XCM-223)



This publication was written by R. Waskom, Colorado State University, Director, Colorado Water Center, and T. Bauder, Extension water quality specialist, department of soil and crop sciences.