NebGuide

University of Nebraska–Lincoln Extension, Institute of Agriculture and Natural Resources

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Fertilizer Use in Home Landscapes

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Homeowners can improve the health and attractiveness of their grass and plants by selecting and applying the proper fertilizer. Learn how to read labels, select a spreader and exercise proper fertilizer management.

Fertilizer use in the home landscape helps maintain an attractive and healthy plant community; however, overapplication can cause excessive growth. Improperly timing applications can create lush growth at times when plant growth should be minimized. Care should be taken to ensure fertilizer is applied correctly to the intended site. Fertilizer misapplied on sidewalks or on frozen ground has a high probability of becoming a pollutant in streams and rivers. This NebGuide reviews proper fertilizer management practices for home landscapes.

Understanding Fertilizer

The soil supplies 13 essential elements for plant growth. If any of those elements is lacking, plant growth is affected. Adding an element to the soil such as an organic or inorganic amendment is known as fertilization. Elemental nutrients are classified into two sub-groups: macronutrients and micronutrients.

Macronutrients are absorbed in large amounts from the soil by plants. These nutrients are nitrogen, phosphorus, potassium, calcium, magnesium, and sulfur. The last three nutrients are sometimes known as secondary nutrients.

Micronutrients are used in lesser amounts by the plant and include iron, zinc, manganese, copper, chlorine, boron, and molybdenum. Three other elements — carbon, oxygen, and hydrogen — are supplied through the air and water, making the total 16 elements needed for plant growth.

The Fertilizer Label

Fertilizers are derived from many sources and contain different amounts of nutrients. A fertilizer can be derived from an inorganic source like ammonia or an organic source such as animal manure.

A common nomenclature has been developed to describe the amount of nutrients in a given fertilizer. A fertilizer tag contains three numbers describing the amount of nitrogen, phosphate, and potash by percentage of weight respectively. A fertilizer analysis of 18-46-0 is 18 percent nitrogen, 46 percent phosphate as P_2O_5, and zero percent potash. A 50-pound bag of this material would contain 9 pounds of nitrogen, 23 pounds of phosphate and no potash *(Figure 1)*.

If a soil test recommended applying 2 pounds of nitrogen per 1,000 square feet, this product would cover 4,500 square feet at the 2 pound nitrogen rate; however, at the same time the product would be supplying 5.1 pounds of phosphate per 1,000 square feet.

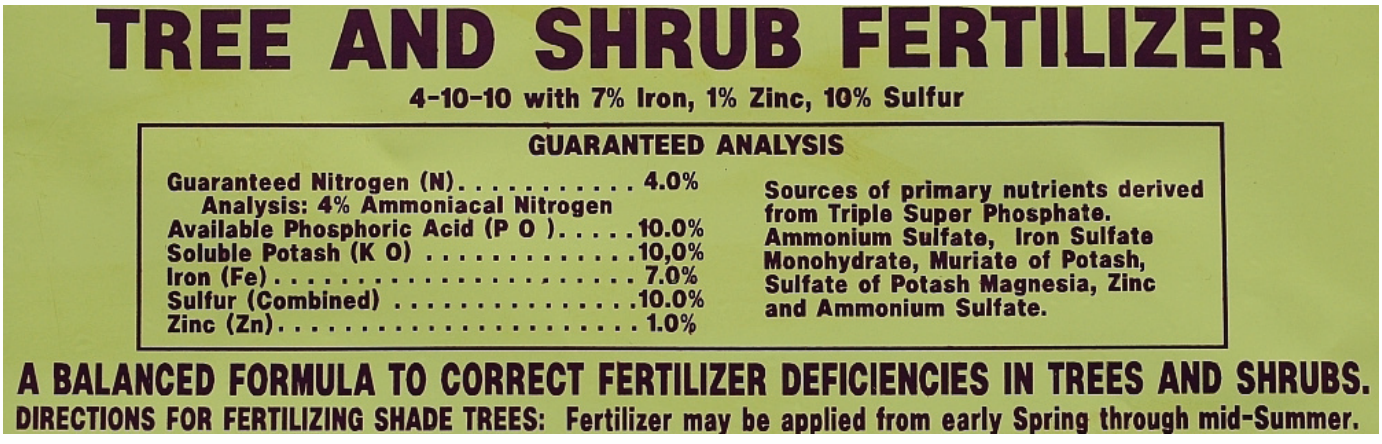

Figure 1. Example fertilizer label showing percent concentration of nutrients.

Other information on the fertilizer label may include the source of the nutrient and the availability of that nutrient. An example would be the fertilizer that contains 20 percent nitrogen, 10 percent which comes from nitrate and 10 percent which comes from sulfur-coated urea. The nitrogen in this fertilizer would be 50 percent quick release and 50 percent slow release.

Soil Testing

The best way to determine the nutrients needed is to have a soil sample tested. Information on obtaining the soil sample can be found in NebGuide 1740, *Guidelines for Soil Sampling*.

A basic soil test usually includes pH, organic matter, potassium, and phosphorus. Additional tests can be run for residual nitrate, micronutrients, and soluble salts.

It is important to know soil nutrient levels so that only needed nutrients can be applied and at a proper rate. Applying excessive fertilizer increases the chance for it to move into storm drains or waterways. If the fertilizer is water soluble some nutrients may leach into groundwater supplies. It is extremely important that proper nitrogen amounts are applied at appropriate times for plant growth and that excess irrigation water is not applied, reducing the potential for nutrient leaching and runoff.

Selecting the Right Fertilizer

Once a soil sample is obtained and the plants or turf to be grown are known, a proper fertilizer program can be designed. It is important to note that a buffalograss lawn should be fertilized differently and at different times than a Kentucky bluegrass or tall fescue lawn. A shrub or flower bed should also be fertilized with different concentrations of nutrients than a bluegrass lawn. When the soil sample is sent into the lab it is important that the plants to be grown are included on the soil test form. This will help ensure proper fertilizer recommendations are made for that specific plant or turf. The soil test report should report the pounds of nutrients needed for a given area.

The next decision is selecting which fertilizer, or combination of fertilizers, to use to supply plants with the needed nutrients. For garden and flower beds the phosphorus recommendation is used as the starting point to meet plant needs. Balanced fertilizers or fertilizers that contain more phosphate are used in this case. Look for fertilizers with analysis such as 10-10-10, 18-46-0, or 11-52-0 to use on gardens and flower beds. For turfgrasses, the nitrogen recommendation is used as the starting point so look for fertilizers that are mostly nitrogen. Fertilizers with analysis like 20-5-5 or 25-5-10 are example formulations for turf use.

Weed and Feed fertilizers are commonly sold to homeowners. These products contain both the fertilizer and a herbicide (pre- or postemergence) that has been added to the fertilizer. When deciding to use this type of fertilizer, make sure the weed to be controlled is listed on the label and the timing of control is right for the herbicide.

While Weed and Feed fertilizer is time efficient, and is commonly applied for preemergence control in the spring, better postemergence weed control may be achieved by applying a separate herbicide at the appropriate time to control targeted weed species. A separate application also allows for spot treatment when weeds are isolated to a small area of the lawn as opposed to a broadcast application over the entire lawn.

Commonly produced dry fertilizers include urea (46-0-0), ammonium sulfate (21-0-0), diammonium phosphate (18-46-0), mono-ammonium phosphate (11-52-0), and potash (0-0-60) *(Figure 2)*. Commonly produced liquid fertilizers include urea ammonium nitrate (32-0-0), ammonium polyphosphate (10-34-0) and ammonium thiosulfate (21-0-0-26S).

Most lawn and garden stores and most large discount retailers sell fertilizer blends or mixes of these products (either dry or liquid) that have been tailored for a national market, not specifically for local conditions. The advantage is they come in convenient, easy-to-handle sizes (20 to 30 pound bags or quart or gallon containers).

Fertilizing Cool Season Turfgrass

On established cool season turf, the nitrogen recommendation may be specific in terms of a given maintenance level and the nitrogen used by the turf. The amount of nitrogen applied to the turf influences other management practice levels. As nitrogen is increased beyond what is needed for growth, management inputs are also increased and the potential for diseases increases considerably. The amount of nitrogen and the timing of application for various maintenance programs is outlined in *Table I*.

Table I. Nitrogen rates and times of application for low, medium, and high maintenance turf.

Management Level	*September*	*Late Fall*	*April-May*	*June*	*Total*	*Mowing Frequency*	*Irrigation Amount*	*Disease Incidence*
	Lbs of N/1000 square feet					Relative input ratings*		
Low		1	0 to 0.5	0	1 to 1.5	2	1	1
Medium	1	1.5	0.5	0	3	2	2	1
High	1	1.5	1	0.5	4	3	3	3

*Ratings 1 = Low, 2 = Medium, 3 = High

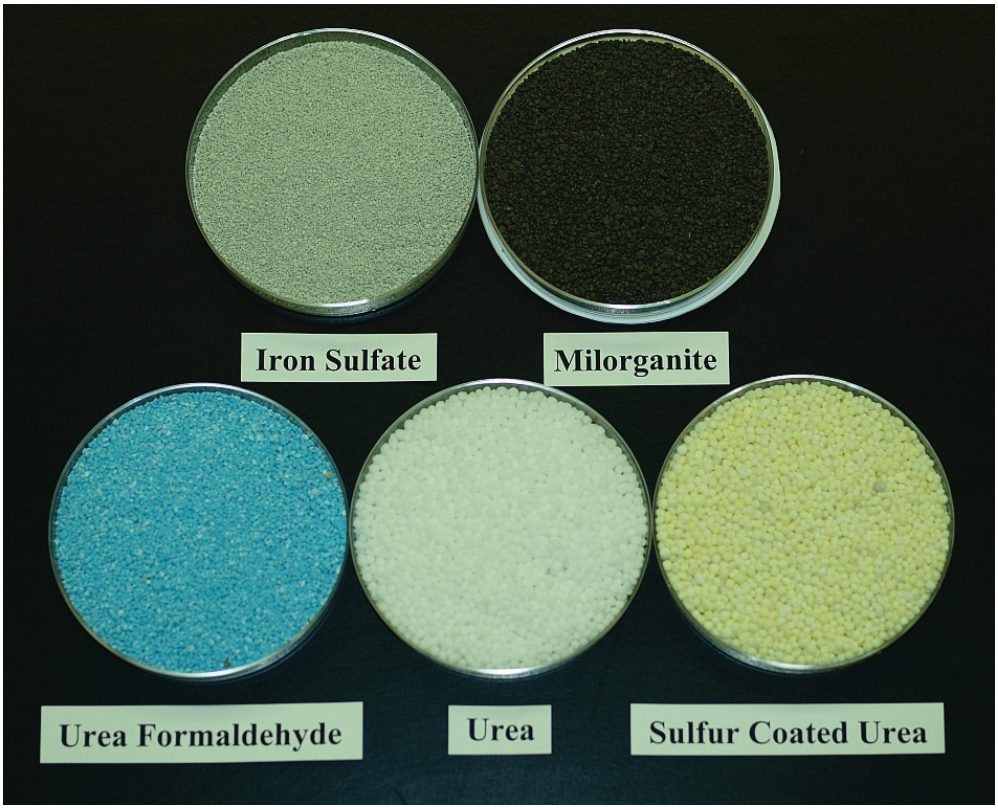

Figure 2. Common materials used in lawn fertilizers.

High maintenance schedules are often used on golf courses. Homeowners should consider low or medium maintenance level schedules. Homeowners wanting to reduce the nitrogen applied to turf should slowly reduce the amount applied by .5 pound per application to a point where the turf quality is still acceptable. A general rule of thumb is to apply one-third of the total annual fertilizer in the spring months and two-thirds in the fall months. When a mulching mower is used or clippings are returned, the nitrogen recommendation can be reduced by 25 percent since leaf clippings recycle nutrients back into the soil as they decompose.

Quick release fertilizers should not be used in May and June or on extremely sandy soils. Quick release fertilizers are water soluble and the nutrients are immediately available for plant use.

Slow release fertilizers are slowly soluble and need microbial activity or moisture to release the nutrients. These fertilizers release the nutrients over a period of time and can be applied less frequently and at higher rates. Common slow release nitrogen fertilizers are sulfur and polymer-coated urea, urea formaldehyde, nutricote, and osmocote.

A combination of both slow and quick release fertilizers are often preferred to get the benefit of both products. Nitrogen fertilizer applied in the spring and early fall should contain more slow release products than quick release. Fertilizer applied in late fall should contain more quick release nitrogen than slow release.

A common problem on cool season grasses, especially Kentucky bluegrass, on high pH soils is iron chlorosis. If the soil test shows a pH of 7.5 or above, consider using a fertilizer that contains 5 percent or more iron. An alternative is to apply 5 pounds of granular iron sulfate per 1,000 square feet in late spring. If you desire a deep green turf without the growth associated with nitrogen application, fertilizers low in nitrogen and containing iron give you the color without increasing growth.

Fertilizing Warm Season Turfgrass

Warm season turfgrass like buffalograss and zoysiagrass need to be fertilized differently than cool season turf. Applying fertilizer in April or May to warm season grasses will not bring the grasses out of dormancy any earlier but will encourage growth of cool season grasses and winter annual weeds. Applying nitrogen on warm season grasses should be done June through July when the grass is actively growing. Splitting the applications will give a better response. Rates for the entire season should not exceed 1 to 2 pounds of nitrogen per 1,000 square feet. The higher rate will increase the amount of water and mowing required.

Fertilizing Trees and Shrubs

Trees and shrubs grown in landscapes with a turf component usually receive adequate amounts of nitrogen from lawn fertilization and do not require additional fertilization. Trees grown in alkaline soil conditions may need fertilization with micronutrients, especially iron. Iron chlorosis is a common problem in these soils. Soil, trunk, or foliar applications may help reduce the visual symptoms. More information on fertilizing trees and shrubs is available in NebGuide 1466, *Determining the Need to Fertilize Landscape Trees and Shrubs.*

Fertilizing Landscape Beds

When establishing a new landscape bed, always start with a soil test. This is also a good time to add organic materials like compost or animal manures to the bed. Select fertilizers where the ratio of the nutrients is balanced. On established beds, compost can be used as a mulch that, as it breaks down, releases nutrients for the plants to use. Be careful not to over-apply manures or compost. Usually 40 to 50 pounds per 100 square feet of area should be sufficient. NebGuide 945, *Fertilizers for Vegetables in Home Gardens* has additional information on amending soil pH for gardens with sulfur or lime.

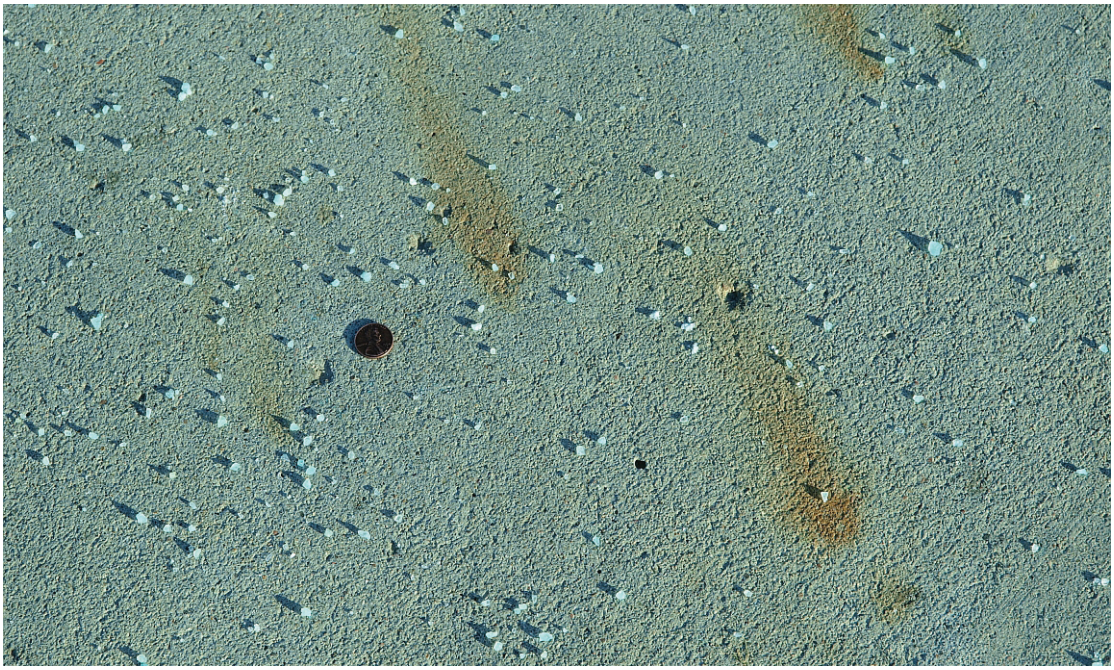

Figure 3. Off-target application of fertilizer can stain the concrete and cause nutrient runoff into water sources.

Selecting Application Equipment

Different types of equipment are available for fertilizer application. The two most popular types are drop spreaders and rotary spreaders. Both pieces of equipment have advantages and disadvantages.

Drop spreaders more uniformly apply fertilizer if properly maintained and used. Using a drop spreader around concrete drives and sidewalks helps ensure that fertilizer is spread on the turf and not on the concrete where rain or excess irrigation water would wash it into stormwater drains. Fertilizing with a drop spreader is more time consuming than fertilizing with a rotary spreader. It is also more difficult to maneuver around trees, shrubs, and other landscape features than a rotary spreader.

Rotary spreaders can cover large areas in a short amount of time. Know the effective spread width to ensure accurate application and to avoid application onto unintended sites *(Figure 3)*.

A good practice to use with both spreaders is to apply half of the needed amount in one direction and then apply the other half in a perpendicular direction. After application, sweep or blow fertilizers off unintended sites back onto the lawn.

Once the spreader is chosen, it should be calibrated to ensure correct application. To establish the initial setting, look on the fertilizer label for the model or type of spreader being used. Spread out a large sheet of plastic at least 15 feet wide by 15 feet long. Using masking tape, mark an area 10 feet wide by 10 feet long, operate the spreader on top of the plastic and collect the fertilizer. Weigh the fertilizer collected and multiply by 10 to get the amount of product applied per 1,000 square feet. Multiply that number by the percent nitrogen in the product. For example, if 0.4 pounds of material with an analysis of 25-5-5 is collected on the plastic, the pounds of nitrogen applied per 1,000 square feet would be 0.4 pounds of product x 10 = 4 pounds per 1,000 square feet x .25 = 1 pound of nitrogen per 1,000 square feet.

This publication has been peer reviewed.

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Issued April 2009