UNIVERSITY OF ARKANSAS
DIVISION OF AGRICULTURE
Cooperative Extension Service

Agriculture and Natural Resources

FSA2114

Fertilizing Your Lawn

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Proper fertilization is necessary to produce a healthy, high-quality, attractive lawn. The first step in fertilizing your home lawn is to obtain a soil test before applying any nutrients. A soil test provides key information including soil pH, potassium and phosphorus levels. Soil testing is free through county Cooperative Extension Service offices. Collect soil samples in a bucket from the upper 4 to 6 inches of soil from ten or more locations around the lawn. Remove any vegetative material such as stems and leaves and air dry and mix the samples thoroughly. Take about 1 pint of the mixture to your county Extension office for analysis (for more information see FSA2121, *Test Your Soil for Plant Food and Lime Needs*). Soil can be sampled any time of the year, but sampling lawns in late fall or winter will make sure the results will be available before fertilizer is needed in the spring.

Calculating Your Lawn Area

The next key step in fertilizing your lawn is to determine the size. This will aid in calculating how much fertilizer and other materials you will need to maintain your lawn. The best way to do this is to divide your lawn into several squares, rectangles or circles. Calculate the area of these smaller shapes and then add them together to determine the total size of the lawn (Figure 1).

Area Calculation Example

This example illustrates how you might go about calculating the area of your lawn (Figure 2).

Take-Home Points

- Before you fertilize your lawn, have your soil tested.
- It is important to accurately determine the size of your lawn and to calibrate your spreader prior to fertilization.
- Proper nitrogen application timing and quantity are important and vary by turf species.
- Never apply more than 1.0 lb N per 1,000 ft^2 in any one application unless 50 percent or more of the nitrogen is slow-release.
- Use a mixture of quick- and slow-release nitrogen sources to allow for a quick green-up and an extended feed.
- Do not apply fertilizer to lawns immediately following or preceding a heavy rainfall.
- Sweep or blow any fertilizer off your driveways, sidewalks and streets back into the lawn after applying.

Acre or 1,000 ft^2

Fertilizer calculations are often expressed as the amount needed per 1,000 ft^2. It is important to keep in mind the units we are dealing with when calculating fertilizer needs.

1 acre = 43,560 ft^2

For example: 20,000 ft^2 is equivalent to 0.46 acre (20,000 ft^2 ÷ 43,560 ft^2)

or

0.79 acre is equivalent to 34,412 ft^2 (0.79 × 43,560 ft^2)

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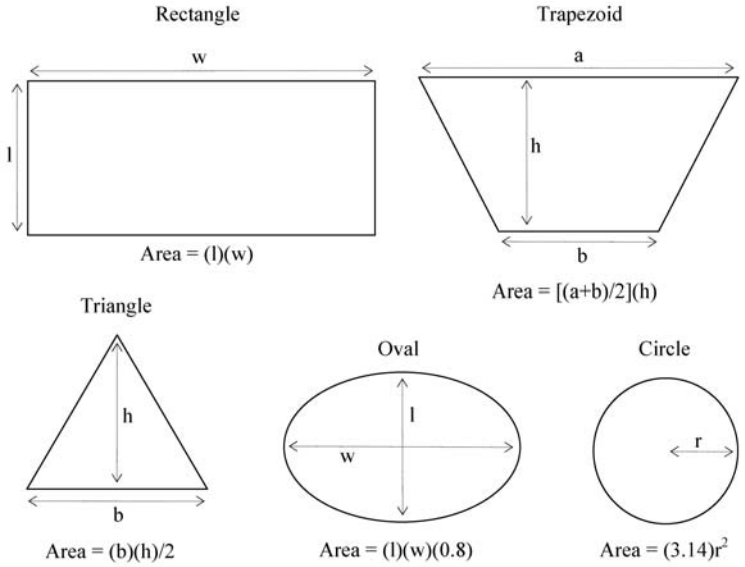
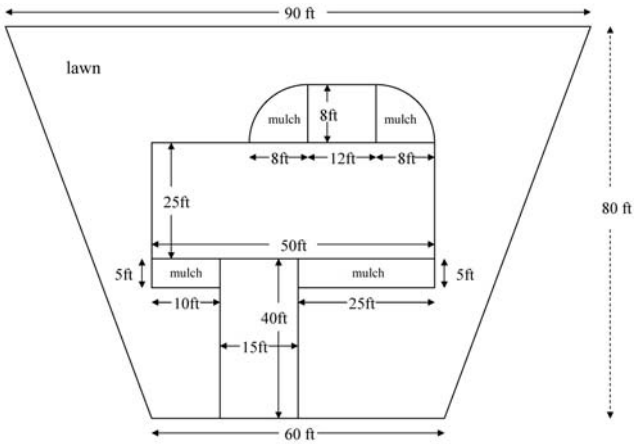


Figure 1. Common shapes and their calculation formulae.



Section (land)	Area ft^2
Total land ((90 ft + 60 ft)/2) x 80 ft	6,000 ft^2
Section (hard surfaces)	Area ft^2
House (50 ft x 25 ft)	1,250 ft^2
Driveway (15 ft x 40 ft)	600 ft^2
Porch (8 ft x 12 ft)	96 ft^2
Mulch 1 (10 ft x 5 ft)	50 ft^2
Mulch 2 (25 x 5 ft)	125 ft^2
Mulch 3 (0.25 x 3.14 x 8^2)	50 ft^2
Mulch 4 (0.25 x 3.14 x 8^2)	50 ft^2
Total objects	2,221 ft^2
Total turfgrass (6,000 ft^2 – 2,221 ft^2)	3,779 ft^2

Figure 2. Sample layout of a home lawn.

The Fertilizer Label

The two most important pieces of information on the fertilizer label are the analysis and the type(s) of nitrogen fertilizer. The fertilizer analysis is a series of three numbers which provides information on the three most important nutrients for plant growth (nitrogen, phosphorus and potassium) (Figure 3). The numbers in the fertilizer analysis express the nutrients as the percentage N, available P_2O_5 and soluble K_2O.

For example, a fertilizer with a 20-4-8 analysis contains 20 percent nitrogen, 4 percent available P_2O_5 and 8 percent soluble K_2O.

The fertilizer analysis contains information on the type(s) of nitrogen fertilizer. There are two basic types: slow-release and quick-release. The fertilizer label provides you with information on the amount and type of slow-release fertilizers. Examples of quick-release N (also called water-soluble nitrogen, WSN) sources include urea, ammonium nitrate, ammonium sulfate, diammonium phosphate (DAP) and potassium nitrate. Examples of slow-release N (also called water-insoluble

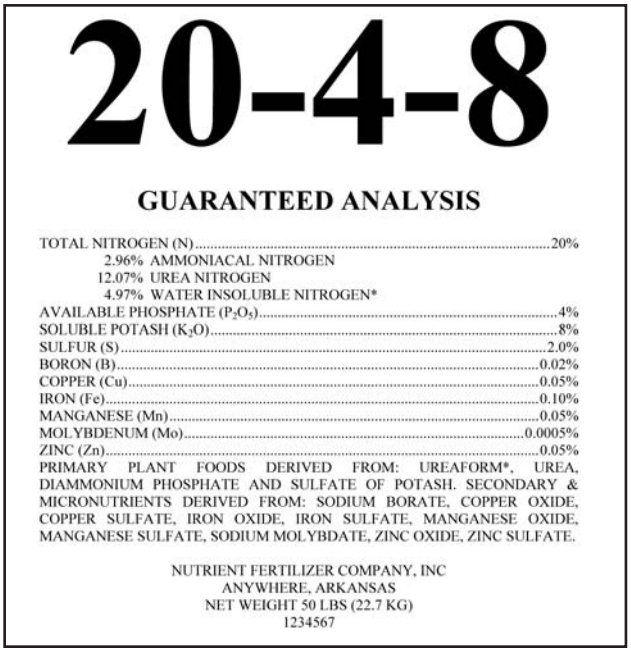


Figure 3. Sample fertilizer label.

nitrogen, WIN) include methylene ureas (examples: methylenediurea, dimethylenetriurea, etc.), urea formaldehyde (ureaform), isobutylenediurea (IBDU), sulfur-coated urea (SCU), polymer-coated urea, as well as natural organic forms. Natural organic and some other slow-release forms of nitrogen must be broken down by soil microbes in order for them to become available to the lawn. Each type of nitrogen source has advantages and disadvantages (Table 1). Our recommendation is to use a mixture of quick- and slow-release nitrogen sources in most situations.

Plant Nutrients

Plant nutrients fall into two broad categories (macronutrients and micronutrients). Their classification does not have anything to do with importance, just their concentration in the plant. Micronutrient deficiencies (Fe, B, Mn, Cu, Mo, Zn, Cl and Ni) in Arkansas are rare. Of the macronutrients (C, H, O, N, P, K, Ca, Mg and S), nitrogen is the most commonly deficient nutrient in lawns.

Nitrogen (N) is the key nutrient for turf growth and development. When deficient, turf will exhibit a general yellowing of older leaves or light green appearance of young leaves. Additionally, reduced growth and turf vigor are other signs of nitrogen deficiency. Over time, nitrogen-deficient turf will become a poor competitor and weeds will encroach upon lawns. However, fertilizing your lawn with nitrogen increases turf health and allows your lawn to outcompete most weed species. Be careful not to apply more nitrogen than is recommended because this can reduce turfgrass health, enhance disease development and increase the risk of environmental contamination.

Phosphorus (P) or phosphate is an important ingredient for the energy processes inside the plant and also for root growth during establishment, but it is needed at much lower levels than nitrogen. Optimum turf growth occurs when there is > 25 ppm (50 lb/A) of P in soils. Phosphorus deficiency symptoms include burned leaf tips followed by older leaves turning a dark green or reddish-purple. Based on data from the University of Arkansas Soil Test Laboratory, approximately 86 percent of lawn soils in Arkansas have enough phosphorus to sustain optimum turf growth. Therefore, fertilizers with low P ratios (examples: 22-3-14, 26-2-13, 29-3-4, 29-2-5) or no phosphorus (examples: 10-0-14, 16-0-8, 34-0-0, 46-0-0) should be used on these lawns.

When soil phosphorus is at optimum levels, it is not prone to leaching in lawns and, as such, poses little threat to groundwater resources, since the phosphorus is bound tightly to soil particles. There is some risk of leaching if excessive amounts of phosphorus are applied to lawns. However, the greatest potential risk of phosphorus contaminating surface waters is from soil erosion. A dense lawn is your best defense against erosion. Even on weak lawns with poor turf quality, turf swards significantly reduce sediment loss. Erosion control blankets or straw should be used during establishment of new lawns to reduce the risk of erosion. There is little risk of phosphorus applications to lawns contaminating surface or groundwater supplies except when fertilizer is incorrectly applied onto impervious surfaces (driveways, sidewalks, etc.) or in cases where soil erodes.

Potassium (K) or potash deficiencies are rare in turf and often difficult to diagnose. Symptoms might include scorching of the leaf tip and interveinal yellowing. Optimum turf growth occurs when there is > 100 ppm (200 lb/A) of K in soils. Based on data from the University of Arkansas Soil Test Laboratory, approximately 77 percent of lawn soils in Arkansas have enough potassium to sustain optimum turf growth. Potassium improves stress tolerance in high traffic situations and during drought. Potassium is thought to also improve winter hardiness in some situations. As a result, it is commonly recommended that a “winterizer” fertilizer containing a higher ratio of K be applied in autumn prior to winter dormancy. However, research shows that additional autumn K fertilization will not reduce winter injury if a soil test indicates that your lawn soil has optimum levels of K.

Iron (Fe) deficiency is rare in Arkansas because of the lower pH of most lawn soils. Deficiency symptoms are similar to a nitrogen deficiency with a general yellowing of the turf. Iron deficiencies are best corrected by lowering pH instead of applying additional iron. Applying additional iron to turf can result in a darker green turf without stimulating turf growth. Although turf will respond to additional iron fertilization, this does not always indicate that the turf is iron deficient.

Table 1. Comparison of quick-release vs. slow-release nitrogen fertilizers.

Quick-release (WSN) fertilizers	Slow-release (WIN) fertilizers
Low cost per unit N	High cost per unit N
Increased control of fertility management	Reduced control of fertility management
Quick initial response	Slow initial response
Liquid application possible	Most are dry formulations
High burn potential	Low burn potential
Higher N loss potential	Lower N loss potential
Lower application rates with more frequent applications	Higher application rates with fewer applications
Release dependent on irrigation/rainfall	Release may depend on a combination of water, temperature and/or microbial activity

Table 2. Nitrogen fertilizer recommendations for Arkansas lawns.

Lawn turf	Amount of N to apply lb N/1,000 ft^2/year	Application timing
Warm-season grasses		
Bermudagrass	3-5	May-September
Centipedegrass	1-2	June-August
St. Augustinegrass	1-3	June-August
Zoysiagrass	1-2	June-August
Cool-season grasses		
Tall Fescue†	2-4	April, September, November

†Kentucky bluegrass, hybrid bluegrass and perennial ryegrass should be fertilized with similar quantities and timings.

Magnesium (Mg) is an important component in chlorophyll production. Similar to iron, magnesium deficiency results in a general yellowing of the turf. However, different from iron, magnesium deficiencies typically occur on low pH soils. Soil test can indicate if magnesium is at or below optimum levels (< 30 ppm, 60 lb/A). An easy method to test for a deficiency is to mix one tablespoon of Epsom salts (magnesium sulfate) in a gallon of water and apply to the turf. If the treated area turns darker green within a few days, then this indicates a magnesium deficiency. Magnesium deficiencies can be corrected by applying dolomitic lime (lime with 10 percent or more Mg) or potassium magnesium sulfate (0-0-22).

Fertilizer Recommendations

The amount of nitrogen fertilizer required by turf depends on species (Table 2) and various management and environmental/management factors (Table 3). Never apply more than 1.0 lb N/1,000 ft^2 in any one application unless 50 percent or more of the nitrogen is slow-release. If 50 percent or more of the nitrogen is slow-release, you have the option of applying twice the recommended amount of nitrogen half as often. Do not apply fertilizer more frequently than once monthly unless you are establishing a new lawn.

The timing of N fertilizer applications depends on the lawn species. **Warm-season** turfgrasses such as bermudagrass (*Cynodon* spp.), centipedegrass (*Eremochloa ophiuroides*), St. Augustinegrass (*Stenotaphrum secundatum*) and zoysiagrass (*Zoysia* spp.) should be fertilized in the summer months when they are actively growing. **Cool-season** turfgrass species such as tall fescue (*Festuca arundinacea*) should be fertilized mainly in the autumn. A

Table 3. Factors that influence annual nitrogen applications.

Quality and expectations	Adjustment of nitrogen application rate/frequency
Age of the turf (or soil)	Typically, less nitrogen is needed on lawns that have been well-maintained for many years.
Clipping removal	Returning clippings causes an annual increase of about 1.0 lb N/1,000 ft^2/year. Therefore, it is recommended that you return clippings. If clippings are removed, N fertilization should be increased.
Use (traffic)	Fertilization will need to increase to help turf recover from traffic injury.
Irrigation	Irrigation increases plant growth. Irrigated lawns may need some additional fertilization. Do not over-irrigate.
Species and cultivar	Bermudagrass requires more nitrogen fertilization than other species because it produces more biomass.
Climatic conditions (weather)	If weather is not favorable to turfgrass growth, less fertilizer will be needed or fertilization timing should be shifted.
Length of growing season	If growing conditions are favorable for longer periods of time, additional fertilization may be necessary.
Soil conditions (texture, cation exchange capacity)	Sandy soils are not as capable of holding nutrients. Use slow-release fertilizers on sandy soils and increase the total annual N applied by 20 percent. Alternatively, soils with high quantities of organic matter need less nitrogen fertilization. Reduce the total annual N applied by 20 percent or more.
Site specific conditions (shade, etc.)	Turfgrass growth is reduced in shade, so fertilization should also be reduced in shady areas.
Diseases	Some turfgrass diseases are exacerbated by too little or too much fertilization.
Recuperative needs	Turfgrass damaged by drought stress or traffic may need additional fertilization to help recuperate.
Budget	If budget is limiting, use more frequent applications of a quick-release fertilizer at lower rates or reduce the total annual nitrogen applied.

fertilization in September, November and an application in the spring after the flush of growth (April or May) will result in a healthy turf. Avoid fertilizing tall fescue in the summer months because of increased risk of the disease brown patch. Lawns damaged during summer months and newly seeded lawns may need an additional N fertilizer application in October to help with recovery and establishment.

Regardless of species, turf should only be fertilized when it is actively growing. Therefore, do not fertilize lawns during winter months on warm-season turf and during drought with any species.

Which Product Do I Use?

There are many fertilizer choices available to the homeowner (Table 4). Organic, inorganic and synthetic organic products are all available. As with all plants, turfgrasses cannot tell the difference between the sources of nutrients. Some products contain high amounts of slow-release N, while others contain none. Our recommendation is to use a mixture of quick- and slow-release nitrogen sources in most situations. Although there are exceptions to the rule, it is good practice to use products with a greater percentage of slow-release nitrogen sources during warmer months and a greater percentage of quick-release nitrogen sources during cooler times of the year.

Your soil test report will help you choose which fertilizer might work best for your lawn. The soil test will report your soil P and K levels and also provide an N, P and K fertilization recommendation based upon your lawn species. Table 5 lists examples of fertilizers that can be used based upon the soil test recommendations.

Fertilizer Calculations

How much fertilizer is needed to fertilize an area at a given rate? Soil test reports provide recommendations for the amount of total N required per year. This can be broken down into two to four fertilizer applications of 1 lb of N/1,000 ft^2 depending on species. Table 4 provides information for common fertilizer analyses on the amount of fertilizer that is needed in order to apply 1 lb of N/1,000 ft^2. General equations and examples are given in order to hand calculate the amount of fertilizer you need for your lawn.

Table 4. The fertilizer analysis, percentage of slow-release fertilizer contained in each, size of the fertilizer bag, amount of fertilizer needed per 1,000 ft^2 to deliver 1.0 lb N, amount of fertilizer needed per acre to deliver 1.0 lb N/1,000 ft^2, the cost per bag and the cost per pound of N for common lawn fertilizers available in 2007 at Arkansas lawn and garden centers, home improvement stores and retail supercenters.

Fertilizer analysis†	% slow-release	Pounds/bag	Pounds fertilizer/1,000 ft^2‡	Pounds fertilizer/acre‡	Cost/bag	Cost/lb N (cost/1,000 ft^2)
6-2-0§	88	40	16.7	726	$10.95	$4.56
10-20-10	0	40	10.0	436	$7.88	$1.97
10-10-10	0	40	10.0	436	$7.17	$1.79
10-0-14	0	20	10.0	436	$13.95	$6.98
11-2-2§	91	29	9.1	396	$14.99	$4.68
13-13-13	0	40	7.7	335	$6.47	$1.24
13-13-13	15	33	7.7	335	$6.58	$1.53
16-0-8	25	20	6.3	272	$18.50	$5.78
18-24-6	21	54	5.6	242	$24.97	$2.57
20-27-5	23	18	5.0	218	$14.24	$4.00
22-3-14	22	14	4.5	198	$11.99	$3.89
26-2-13	27	58	3.8	168	$25.44	$1.70
27-3-4	24	19	3.7	161	$9.44	$1.89
28-3-8	24	13	3.6	156	$10.97	$3.01
29-3-4	24	47	3.4	150	$24.98	$1.85
29-3-4	25	16	3.4	150	$6.27	$1.39
29-2-5	25	48	3.4	150	$18.97	$1.36
34-0-0	0	40	2.9	128	$9.97	$0.73
35-5-5	55	16	2.9	124	$11.97	$2.14
46-0-0	0	50	2.2	95	$14.50	$0.63

†Products are sorted by nitrogen analysis in ascending order.
‡Calculations were made assuming that the fertilizer is applied at a rate of 1.0 lb N/1,000 ft^2.
§Natural organic fertilizer derived from sewage sludge or poultry, feather and bone meals.

Table 5. Selecting a fertilizer based on soil test recommendations.

	Soil K ≤ 100 ppm	Soil K > 100 ppm
Soil P ≤ 25 ppm	Choose products that are high in P and K. Fertilizers with high P and K ratios (examples include but are not limited to: 10-20-10, 10-10-10, 13-13-13, 19-19-19) should be used on these lawns.	Choose products that are high in P and low in K. Fertilizers with high P and low K ratios (examples include but are not limited to: 18-24-6, 20-27-5) or no K (examples include but are not limited to: 6-2-0) should be used on these lawns.
Soil P > 25 ppm	Choose products that are low in P and high in K. Fertilizers with low P and high K ratios (examples include but are not limited to: 22-3-14, 26-2-13) or no P (examples include but are not limited to: 10-0-14, 16-0-8) should be used on these lawns.	Choose products that are low in P and K. Fertilizers with low P and K ratios (examples include but are not limited to: 11-2-2, 27-3-4, 29-3-4, 29-2-5, 35-5-5) or no P or K (examples include but are not limited to: 34-0-0, 46-0-0) should be used on these lawns.

Calculate the Amount of Fertilizer Needed

General Formula

Rate	1 lb fertilizer	Area to be treated
1,000 ft^2	Analysis	

Example 1. How much 20-4-12 is needed to apply 1.0 lb N/1,000 ft^2?

1.0 lb N	1 lb fertilizer	1,000 ft^2
1,000 ft^2	0.2 lb N	

This should be computed as 1.0 lb N × 1 lb fertilizer × 1,000 ft^2 ÷ 1,000 ft^2 ÷ 0.2 lb N = answer = 5.0 lb 20-4-12 fertilizer.

Example 2. How much 46-0-0 is needed to apply 0.75 lb N/1,000 ft^2 to a 5,000 ft^2 lawn?

0.75 lb N	1 lb fertilizer	5,000 ft^2
1,000 ft^2	0.46 lb N	

This should be computed as 0.75 lb N × 1 lb fertilizer × 5,000 ft^2 ÷ 1,000 ft^2 ÷ 0.46 lb N = answer = 8.2 lb 46-0-0 fertilizer.

Example 3. How much 8-22-10 is needed to apply 1.0 lb P_2O_5/1,000 ft^2 to a 5,000 ft^2 lawn?

1.0 lb P_2O_5	1 lb fertilizer	5,000 ft^2
1,000 ft^2	0.22 lb P_2O_5	

This should be computed as 1.0 lb P_2O_5 × 1 lb fertilizer × 5,000 ft^2 ÷ 1,000 ft^2 ÷ 0.22 lb P_2O_5 = answer = 22.7 lb 8-22-10 fertilizer.

Example 4. How much 32-4-5 is needed to apply 0.8 lb N/1,000 ft^2 to a 4.3-acre lawn?

0.8 lb N	1 lb fertilizer	4.3 acres	43,560 ft^2
1,000 ft^2	0.32 lb N		1 acre

This should be computed as 0.8 lb N × 1 lb fertilizer × 4.3 acres × 43,560 ft^2 ÷ 1,000 ft^2 ÷ 0.32 lb N ÷ 1 acre = answer = 468 lb 32-4-5 fertilizer.

Cost of Application in Price Per Pound of Nutrient

There are many products to choose from, but it is possible to calculate which fertilizers offer the least expensive source of nitrogen.

General Formula

Cost	1 lb fertilizer
Amount	Analysis

Example 6. What is the cost per pound of N for a 50-pound bag of urea (46-0-0) that costs $14.50?

$14.50	1 lb fertilizer
50 lb fertilizer	0.46 lb N

This should be computed as $14.50 × 1 lb fertilizer ÷ 50 lb fertilizer ÷ 0.46 lb N = answer = $0.63 per pound of nitrogen.

How to Apply Fertilizers

Many different types of fertilizer spreaders are available at retail stores and online. Fertilizing by hand is not recommended for lawns. When used correctly, all spreader types can be useful tools for fertilizing a home lawn. However, for most lawns, a rotary spreader is the most user-friendly (easiest to use without making a visible mistake) (Figure 4). To reduce the likelihood of a visible fertilizer misapplication, half the fertilizer should be applied in one direction with the remaining fertilizer applied in a perpendicular direction. Whichever fertilizer spreader you choose, make sure to fill the spreader over a hard surface such as your driveway. This will allow easy cleanup if any material is spilled. Fertilizer spills over turf usually result in turf death to the affected spot. Another consideration to make when fertilizing is the weather. Although it is appropriate to lightly water (< 0.25 inch) your lawn after fertilization, do not apply fertilizer to lawns immediately following or preceding a heavy rainfall event to reduce the risk of fertilizer runoff or leaching.

Figure 4. Misapplication using a drop spreader.

Rotary Spreaders
- Medium to large lawns (> 2,000 ft^2).
- Work best spreading fertilizer with medium to large granules.
- A rotary spreader throws fertilizer granules approximately 3-5 ft on either size of the spreader (depending on type of spreader and fertilizer) with more fertilizer being applied closer to the spreader. Turn off your spreader when you reach the edge of your lawn. To ensure even application, fertilizer should be applied in a manner where the fertilizer from your current pass is being thrown to the wheel tracks of your previous pass. Because of the distribution pattern of the particles from a rotary spreader, this overlap will help ensure uniform application.

Drop Spreaders
- Small lawns (< 2,000 ft^2).
- Work best spreading fertilizer with small granules.
- A drop spreader only drops fertilizer granules directly underneath the spreader. To ensure even application with this type of spreader, there will be some overlap of wheel tracks (usually a few inches).

Hand-Held Spreaders
- Should be used for very small areas.
- Most are miniature rotary spreaders and distribute material in a similar manner.
- Accuracy is questionable.

The first step in applying fertilizers is to calculate how much fertilizer is needed for your lawn. The second step is to calibrate your spreader. Many fertilizers come with information on the proper spreader setting for various spreader manufacturers. These settings are usually accurate, but it is possible to calibrate your spreader if information is not available for the fertilizer product you wish to use.

Calibrating a Rotary Fertilizer Spreader

Step 1. Measure the width of the effective pattern of the spreader: _____ ft. This is the distance from the center of the spreader to the edge of the fertilizer throw pattern.

Step 2. Measure off a convenient distance to run the spreader: _____ ft. The longer the distance, the more accurate the calibration.

Step 3. Multiply number in step 1 by the number in step 2 to get the area covered by the spreader. Answer = _____ ft^2.

Step 4. Weigh a portion of the product, record the value and dump into the spreader: _____ lb.

Step 5. Push the spreader over the area previously measured in step 3, being careful to shut the spreader on and off precisely at the beginning and end of the course.

Step 6. Weigh the amount of product left in the spreader: _____ lb.

Step 7. Subtract the number in step 6 from the number in step 4. Answer = _____ lb. This is the amount of product applied to the area you have measured in step 3.

Step 8. Divide the number in step 7 by the number in step 3. Answer = _____ (lb/ft^2). This is equal to the amount of product applied per square foot.

Step 9. Multiply the answer from step 8 by 1,000 to give lb product/1,000 ft^2: _____ lb/1,000 ft^2

Step 10. Adjust the spreader setting and repeat the process until the spreader is applying the recommended amount of fertilizer depending upon the analysis.

Calibrating a Drop-Type Fertilizer Spreader

Step 1. Measure the distance between the outside holes in the bottom of the drop spreader: _____ in.

Step 2. Convert this to feet by dividing by 12: _____ ft.

Step 3. Measure off a convenient distance to run the spreader: _____ ft. The longer the distance, the more accurate the calibration.

Step 4. Multiply the number in step 2 by the number in step 3 to calculate the area covered by the spreader. Answer = _____ ft^2.

Step 5. Weigh a portion of the product, record the value and dump into the spreader: _____ lb.

Step 6. Push the spreader over the area previously measured in step 3, being careful to shut the spreader on and off precisely at the beginning and end of the course.

Step 7. Weigh the amount of product left in the spreader: _____ lb.

Step 8. Subtract the number in step 7 from the number in step 5. Answer = _____ lb. This is the amount of product applied to the area you have measured in step 4.

Step 9. Divide the number in step 8 by the number in step 4. Answer = _____ (lb/ft^2). This is equal to the amount of product applied per square foot.

Step 10. Multiply the answer from step 9 by 1,000 to give lb product/1,000 ft^2: _____ lb/1,000 ft^2.

Step 11. Adjust the spreader setting and repeat the process until the spreader is applying the recommended amount of fertilizer depending upon the analysis.

After applying fertilizers, it is important to clean up. First, sweep or blow any fertilizer off your driveway, sidewalks and street back into the lawn. This will help protect water supplies since these surfaces are impervious. When fertilizer is correctly applied to lawns, there is little risk of runoff. Turf affects the overland flow process of water to such a degree that runoff from lawns is insignificant and infrequent. Nutrient concentrations in runoff from turf are low because most chemicals applied to turfgrass are trapped within the leaf, thatch and root zone areas and do not contaminate water supplies. Wash your spreader off over your lawn after you have emptied the spreader and swept any fertilizer from impervious surfaces back onto the lawn.

How Much Nitrogen Was Applied?

The amount of fertilizer needed for your lawn should be calculated prior to application. It is always wise to check how closely you came to applying the correct amount of nutrient after you fertilize your lawn. Let's say that your goal was to apply 0.5 pound of N/1,000 ft^2 to your lawn, which is 7,000 ft^2 using a 12-4-5 fertilizer. After you finished fertilizing your lawn, you determined that you had used 42 pounds of the 12-4-5 fertilizer. At what rate (lb N/1,000 ft^2) did you actually apply nitrogen to your lawn?

General Formula

lb fertilizer applied	Analysis	1,000 ft^2
Total area (ft^2)	1 lb fertilizer	

Example 5. At what rate did you actually apply the 12-4-5 in the illustration above?

42 lb fertilizer	0.12 lb N	1,000 ft^2
7,000 ft^2	1 lb fertilizer	

This should be computed as 42 lb fertilizer × 0.12 lb N × 1,000 ft^2 ÷ 7,000 ft^2 ÷ 1 lb fertilizer = answer = 0.72 lb N/1,000 ft^2.

Fertilizer Terminology

1. **Fertilizer analysis**: Percent composition of a fertilizer expressed as (total N – available P_2O_5 – soluble K_2O).
2. **Inorganic**: Does not contain carbon (ammonium nitrate, ammonium sulfate).
3. **Natural organic fertilizer**: Animal waste products (bone, feather and poultry meals), manure and activated sewage sludges.
4. **Nutrient ratio**: Obtained by reducing (by smallest factor) or creating a ratio of the fertilizer analysis.
   Examples: 28-4-4 = 7-1-1
   10-10-10 = 1-1-1
   16-4-8 = 4-1-2
5. **Organic nitrogen fertilizer**: Contains carbon (example fertilizers: urea, methylene ureas, urea formaldehyde, manure, activated sewage sludge).
6. **Synthetic nitrogen fertilizer**: A fertilizer manufactured from atmospheric nitrogen. These fertilizers may contain either slow-release or quick-release nitrogen forms.
7. **WIN**: Water-Insoluble Nitrogen – An indication of the slowly water-soluble (slow-release) portion of a nitrogen carrier.
8. **WSN**: Water-Soluble Nitrogen – An indication of the readily available (quick-release) nitrogen in a fertilizer.

Online fertilizer calculation tool at http://www. agry.purdue.edu/turf/fertcalc/Fertilization%20calc.html.

Additional fact sheets available at http://publications.uaex.edu/.

For more information about turfgrass, visit http://turf.uark.edu/.

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