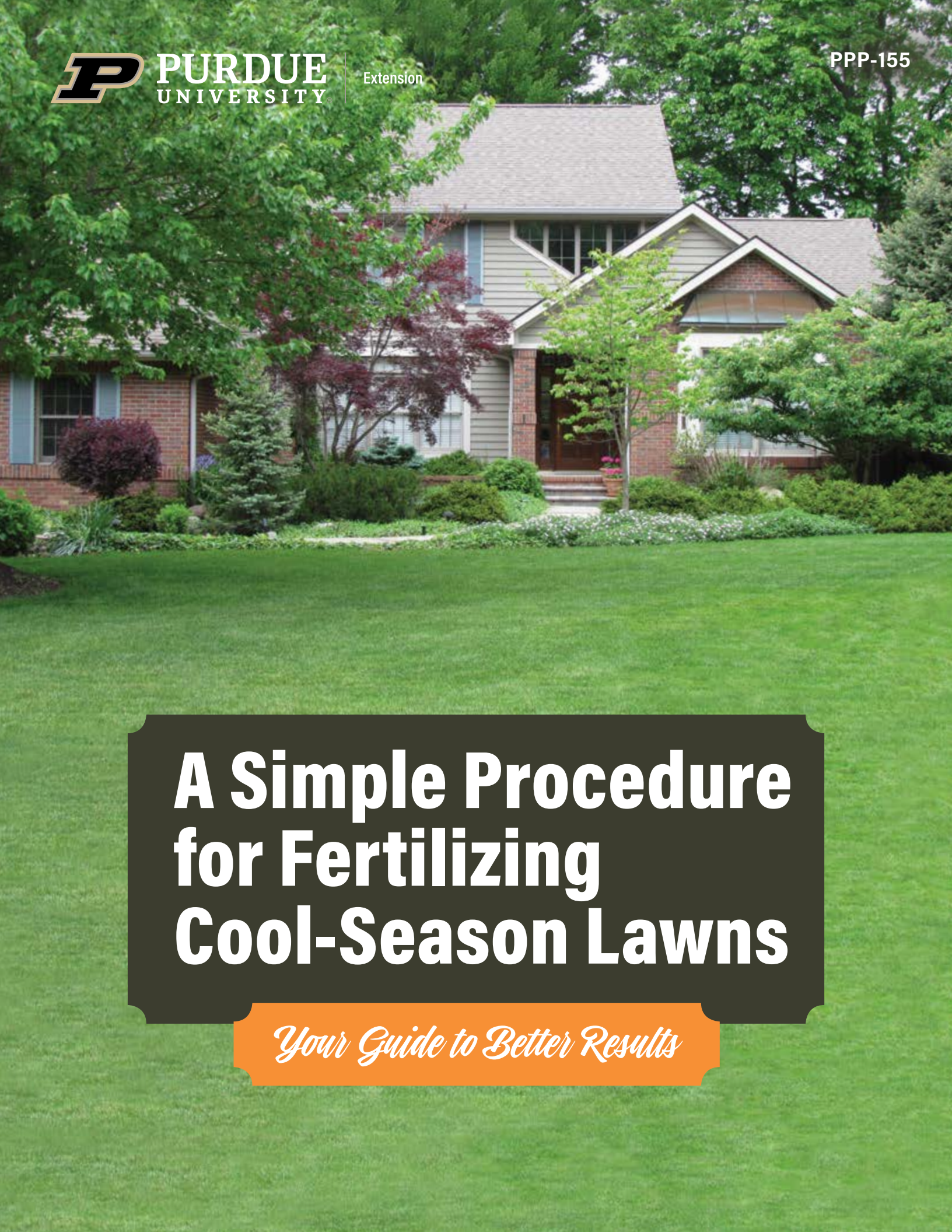


PURDUE UNIVERSITY | Extension

PPP-155

A Simple Procedure for Fertilizing Cool-Season Lawns

Your Guide to Better Results



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Fred Whitford, Director, Purdue Pesticide Programs
Aaron Patton, Turfgrass Extension Specialist, Purdue University
Lee Miller, Extension Turfgrass Pathologist, Purdue University
Geoffrey Schortgen, Wabash County Extension Educator, Purdue University
John Orick, Purdue Extension Master Gardener State Coordinator
Kevin Leigh Smith, Lecturer and Communication Specialist, Purdue Agricultural Sciences Education and Communication

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A beautifully landscaped property with dark green grass moving in the breeze, beds of flowers in full bloom, and strategically placed shrubs can definitely set your property apart from the rest of the homes in the neighborhood. One thing's for sure: people invest a great deal of time, work, and money into creating these beautiful landscapes!

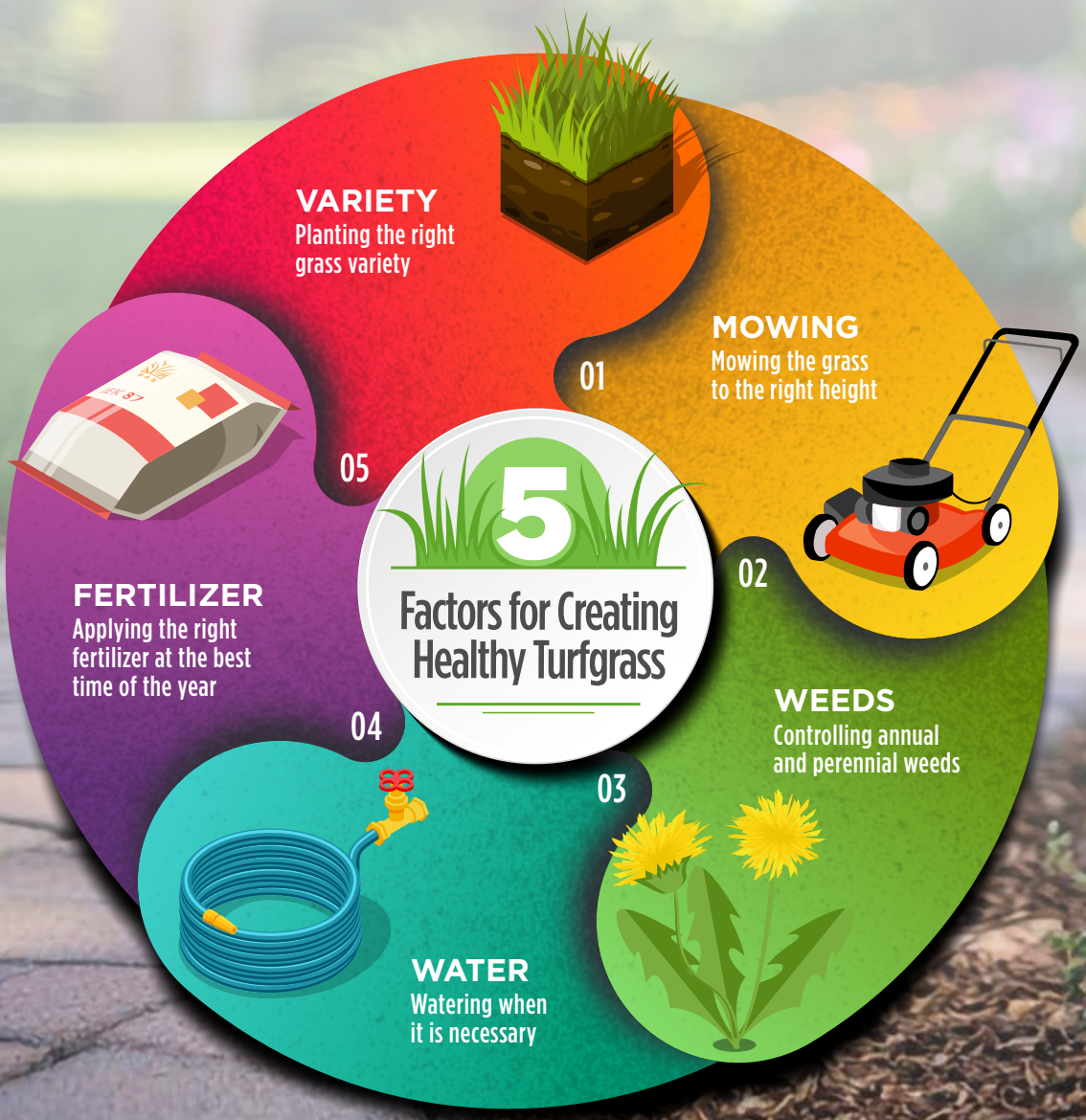
That waving "sea" of turfgrass did not happen overnight. It required

- Planting the right turfgrass species and variety for the growing conditions
- Mowing the grass at the appropriate height
- Controlling annual and perennial weeds
- Watering when necessary
- Applying the right amount of fertilizer at the right time of year

These and other factors are crucial to achieving the healthy and eye-catching turfgrass areas that form the foundation of most landscapes that accentuate homes.

However, conflicting or confusing information can make it difficult to select and apply fertilizer effectively. Common challenges associated with fertilizer applications include:

- A misunderstanding that "more is better"
- Confusion about the appropriate amount of product to apply
- Uncertainty about the meaning of rate recommendations (such as, *1 pound of actual nitrogen per 1,000 square feet*) and why following those recommendations is so important
- The need to calculate the amount of nutrients to apply
- Fertilizer packaging that does not provide instructions on how to set gate openings for specific spreader models
- Fertilizer labels that recommend unrealistic walking speeds or do not provide a speed
- Landscape factors that can affect even fertilizer applications, such as irregular lawn shapes, hills to walk up and down, and so on



These challenges can increase the odds of spreading too little or too much fertilizer on turfgrass areas. This not only wastes money and time, but can also produce unhealthy turfgrass that is deficient in key nutrients. Unhealthy grass can become discolored, weak, and more vulnerable to weeds and other common stresses. Conversely, overfertilized turfgrass can require more mowing and is potentially susceptible to more disease issues.

Perhaps more important is the potential impact fertilizer misapplications can have on the environment. Overapplying fertilizer has the potential of polluting our water resources and contributing to algae blooms.

While there are some liquid fertilizer products, this publication focuses on using rotary or drop spreaders for applying dry fertilizers to turfgrass containing cool-season grasses, such as Kentucky bluegrass, perennial ryegrass, fine fescues, and tall fescue. Your overall goal is to accurately apply the correct rate of actual nitrogen to a turfgrass area. For example, a label may direct you to apply *1 pound of actual nitrogen per 1,000 square feet* evenly distributed by a calibrated spreader. Once home gardeners and turfgrass managers understand such recommendations and put them in practice, they can make more accurate fertilizer applications.

You Are Working Toward Understanding This Phrase

1 pound of actual nitrogen per 1,000 square feet evenly distributed by a calibrated spreader. However, until you understand "pounds of actual nitrogen," "1,000 square feet," and "calibrated spreader," you will face pitfalls that can defeat your aim of surrounding your home with quality turf.

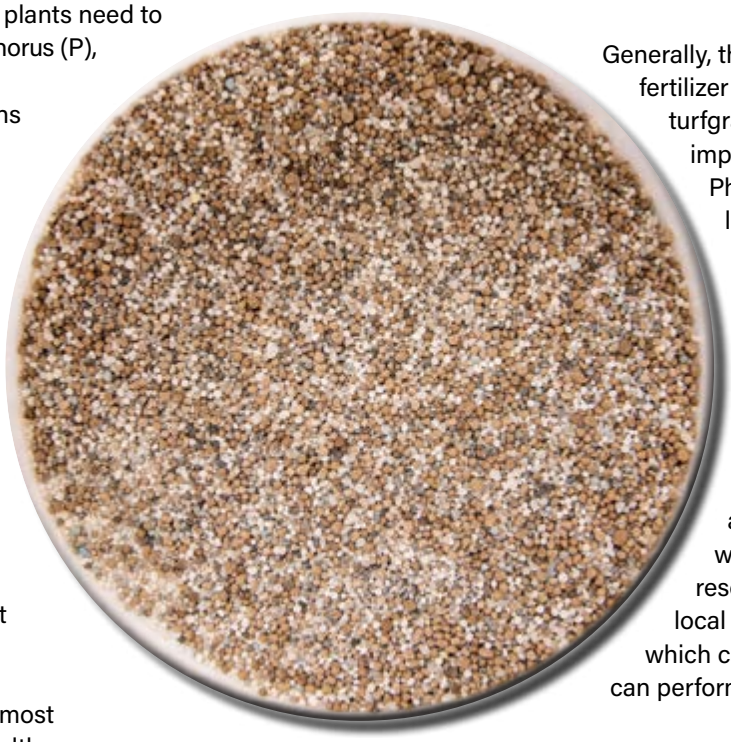


Fertilizer Supplements Soil Nutrients

All soil contains nutrients that plants need to grow, like nitrogen (N), phosphorus (P), and potassium (K).

Nitrogen serves many functions in plants, including improving the green color in turfgrass, increasing the density or number of plants, and keeping plants healthy during periods of stress. Nitrogen is often thought of as the nutrient that supports aboveground leafy green growth. Phosphorus helps keep roots healthy and is important for seedling development. Potassium helps protect turfgrass against drought, diseases, and cold weather.

In most cases, nitrogen is the most limiting nutrient to support healthy turfgrass stands. Turfgrass plants respond more to applications of nitrogen than to phosphorus and potassium.



The different colors in this fertilizer mix are examples of nitrogen, phosphorus, and potassium granules that have been mixed together to come up with the formula written on the fertilizer bag.

Generally, the nitrogen rate guides fertilizer maintenance programs for turfgrass and is usually the most important nutrient in a fertilizer. Phosphorus and potassium levels can fluctuate in soils. The only way to know for sure how much phosphorus and potassium you have in your soil (and if you need to supplement it with fertilization) is to test your soil. Without a soil test, you may overapply phosphorous and potassium, which can waste money and pollute resources. Check with your local county extension office, which can refer you to labs that can perform soil tests.



The grass sample on the right shows thick turf and a well-developed and branching root system — both signs of healthy turf. The sample on the left is turf that has not received any fertilizer for a number of years and shows fewer blades of grass, a light green color, and fewer roots.





Most established lawns have adequate phosphorus levels. These fertilizers and others like them, contain no phosphorus (the middle number in the fertilizer formula). No-phosphorus fertilizers help you reduce the amount of this nutrient you contribute to nearby water supplies. Remember: You might need to have phosphorus in the bag when seeding turfgrass. Phosphorus will help with germination and establishment.



There are many potential reasons why nitrogen levels are often low in lawn soils, including:

- Much of the topsoil was removed to build your home.
- Excessive rainfall and irrigation removed it from the root zone.
- Naturally sandy soils retain fewer nutrients than finer soils like clay and silt.
- Removing grass clippings removes the nitrogen that the plants drew from the soil. Therefore, collecting clippings while mowing removes nitrogen. This nitrogen removal is generally lessened where clippings are mulched back into the canopy rather than being collected and bagged.

Fertilizers commonly supplement deficient nitrogen levels in the soil. For cool-season turfgrasses, experts recommend applying 1 to 3 pounds of actual nitrogen for every 1,000 square feet per year for low-maintenance yards.

Well-maintained lawns require 3.5 to 4 pounds of actual nitrogen per 1,000 square feet per year. Cool-season grasses grow in the spring and fall, making these seasons the best times of year to fertilize.

In general, do not apply more than 1 pound of nitrogen per 1,000 square feet in a single application. While you will see some results of applying more than 1 pound of nitrogen, it is a diminishing return, and many quick-release fertilizer products can injure turfgrass if you apply them at high rates. There can be exceptions for fertilizers that release nitrogen more gradually, including organic fertilizers or slow-release fertilizers (like coated products).

Fall fertilizer applications allow plants to produce and store energy in the form of sugars and nutrients. The stored energy helps the grass to overwinter and helps it green up as the weather warms up in the spring.

Understanding Fertilizer Application Math

Figuring out how much fertilizer you need to apply to your lawn will involve some math. Don't get discouraged with the math you will be asked to do. As you work your way through, you will notice it is easier than it first appears.

How Much Fertilizer Do I Need?

We are often asked "How many bags of fertilizer should I apply on my turf?"
Our standard answer is *1 pound of actual nitrogen for each 1,000 square feet*. For many, this is an unsatisfactory answer to what appears to be a simple question.
But we cannot answer the question more specifically, unless we know the:

- Square footage of the turf you plan to treat
- Fertilizer formula (found on the bag)
- Bag weight

You will need all this information to calculate the number of bags (amount in pounds) of the desired granular fertilizer you need to apply to the turfgrass area. Without this information, the question cannot be answered. Read on to see why this is the case.

Measuring Square Footage for the Turfgrass Area

The total acreage of any lot contains driveways, walkways, houses, and other structures. This may mean that you have a smaller area to fertilize than you initially thought. When it comes to implementing a fertilizer program, what we are really interested in is the number of square feet within each of the turfgrass spaces found on the property. This excludes hardscape features like patios and walkways. It also eliminates landscape beds or similar areas (such as vegetable gardens) — you should fertilize these areas separately based on appropriate soil testing and fertilizer recommendations for plants in those spaces.
It may be helpful to draw a map by hand or using various software tools. You can simply calculate square footage by multiplying length by width. For example, a turfgrass area that is 40 feet long by 30 feet wide would be 1,200 square feet (40 x 30 = 1,200). You can measure these distances if you have access to a rolling measuring wheel. Roll the length and width of the various segments of your lawn (front, sides, back). Don't forget to zero out the wheel between length and width measurements. You can purchase measuring wheels or long-length measuring tapes at local hardware stores or online.
If you don't have a measuring wheel or long measuring tape, a simple method to estimate the length and width is to step it off and record the number of steps for each. But first, you need to figure out how many feet are between each step. Plan on taking 10 steps as a way of measuring your natural gait. At about step five, freeze between your steps. Use a ruler or tape to measure from the front shoe to the back shoe to estimate the number of feet between your steps.



You can calculate square footage by measuring the distance from to the front shoe to the back shoe. "When I practiced, I took five steps and traveled 13 feet. This is 2.6 feet per step." Thus, 50 steps would be 130 feet (2.6 x 50).

Using Figure 1 to the right as an example, assume that you measure two feet between steps. You then record 78 steps for the length (78 steps x 2 feet = 156) and 44 steps for the width (44 x 2 = 88) for the area you have called Grass 1 (front yard). Next, multiplying length by width to get the square feet for the area (156 x 88 = 13,728 square feet). Finally, record the square footage for this area on your map, like the example in Figure 1 (see Grass 1).

Repeat the process for the other turfgrass areas in your landscape. Using the example in Figure 1, we calculated the areas for Grass areas 2-4. Grass 2 is 90 x 20 steps; Grass 3 is 88 steps x 15 steps; and Grass 4 is 10 x 75 steps. Calculate the square feet in each of the Grass areas based on the steps provided. Do your numbers match those provided in Figure 1?

Now we are ready to tackle the 1,000 square feet measurement part of the equation. The phrase *1 pound of actual nitrogen per 1,000 square feet* reminds us that the rates are expressed in 1,000 square foot units instead of square feet.

Figure 1







Notice that we do not calculate the square footage of the house, driveway, flowerbeds, or other areas that do not get fertilized.



Worksheets for your property are available on pages 24-25.

Measuring 1,000 square foot units from square feet is a simple conversion. All you have to do is to divide your total square feet by 1,000 to get how many units of 1,000 are within that green space that needs fertilizer. Write that number down on your map (Figure 2). We can round up or down while doing this step to keep the numbers simple. This will not alter how your grass responds or looks.

Figure 2



Area	Square Feet	Number of 1,000 Square-Foot Sections of Turfgrass
GRASS 1	13,728	13.7 or about 14
GRASS 2	7,200	7.2 or about 7
GRASS 3	5,280	5.3 or about 5
GRASS 4	3,000	3.0
Total	29,208	29.2 or about 29

An Alternative Method for Getting Lawn Square Feet

In the digital age, several online mapping systems are available to measure area via satellite imagery, including:

- Acme Planimeter: acme.com/planimeter
- Map Developers area finder: mapdevelopers.com/area_finder.php

With these and other tools, you can zoom into the region or type in an address to find your property or get close. Pan around with map view until you find your house and then change to the satellite image layer. Select "draw new area" or similar tool and draw a border around your front, sides, and back lawns and add them together to get a total. This can be a good method to check yourself if using the above method to see if you get a similar number (plus or minus 10 percent). As a caveat, most imagery used in these web-based tools can be quite a few years old, so newer home lots may not be represented.

The Three Numbers on Fertilizer Bags

You might have noticed that the word *actual nitrogen* is italicized throughout the publication. This is meant to *emphasize* that **a fertilizer bag that weighs 20 pounds does not contain 20 pounds of nitrogen**. The amount of *actual nitrogen* depends on two factors:

- The percentage of nitrogen in the formulation
- The total weight of the fertilizer bag

When A Pound Does Not Equal A Pound

One pound of nitrogen is not the same as one pound of fertilizer. So, what does one pound of *actual nitrogen* mean? Keep reading to find out!

All fertilizer bags list a three-digit formula along with the total weight of the product. The first number represents nitrogen, the second number phosphorus (P_2O_5, or phosphate), and the third number potassium (K_2O, or potash). This is often abbreviated as N-P-K.
Each of the three numbers represents a percentage of the total weight of the bag that contains that nutrient. This fertilizer blend (28-5-10) contains 28 percent nitrogen. The bag weighs 40 pounds. The bag therefore has about 11 pounds of *actual nitrogen* (0.28 x 40 = 11.2 pounds). This demonstrates that while the bag is 40 pounds, the amount of *actual nitrogen* in the bag is about 11 pounds. It also contains 2 pounds of phosphate (phosphorus) and 4 pounds of potash (potassium). Can you figure out how we got the amounts for phosphorus and potassium?





1



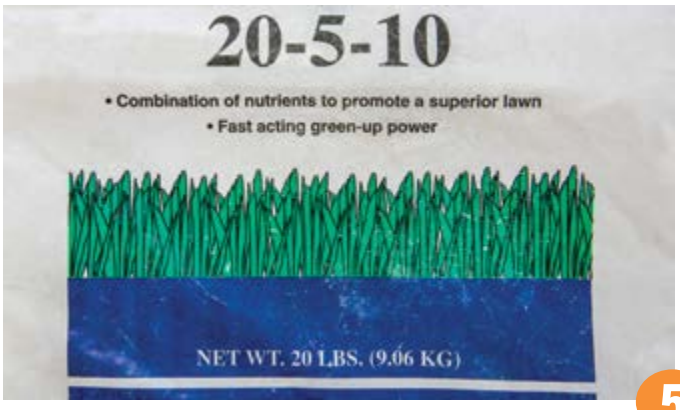
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3



4



5

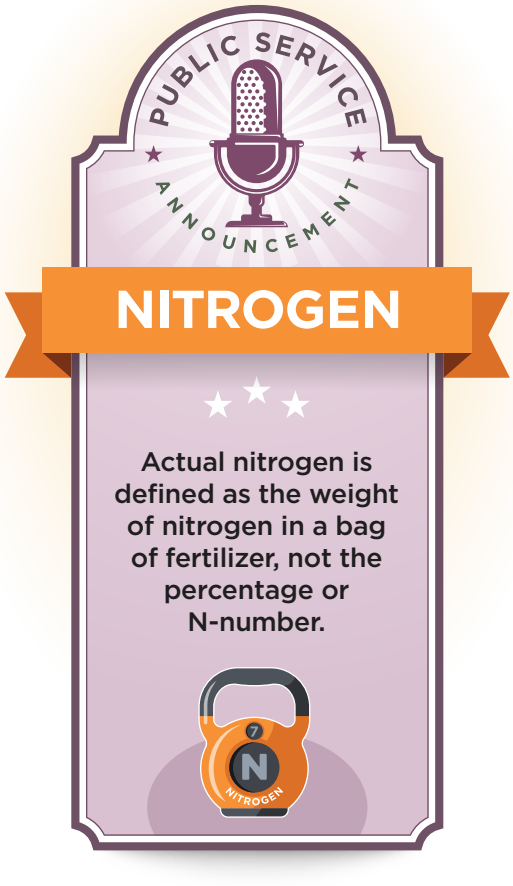
Calculate How Much *Actual Nitrogen* Is in Each Bag

Answers in approximate pounds of *actual nitrogen* in bag:

1. 0.28 (%N) x 17 (total weight of bag) = **4.8 pounds** of *actual nitrogen* in the bag
2. 0.30 x 17 = **5 pounds** of *actual nitrogen*
3. 0.12 x 40 = **5 pounds** of *actual nitrogen*
4. 0.29 x 46.55 = **13.5 pounds** of *actual nitrogen*
5. 0.20 x 20 = **4 pounds** of *actual nitrogen*

What Did We Learn from These Calculations?

The pounds of *actual nitrogen* are based on the product's percentage of nitrogen contained in the bag and the total weight of the bag. If either the weight of the product in the bag or the percentage of nutrient changes, then the amount of actual nitrogen will also change. This means that every fertilizer product will more than likely require its own unique calculations.



Now you know one piece of the information to help you accurately apply *1 pound of actual nitrogen per 1,000 square feet* across the target green areas around the home. This effort will help to make a more accurate fertilizer application with minimal water and runoff of the product you purchased.

How Many Bags Will I Need to Purchase?

How many bags of the following two fertilizers would I need to purchase to treat a turfgrass space of 29 units of 1,000 square feet at a rate of 1 pound of actual nitrogen per 1,000 square feet (see table on page 10)?

Fertilizer Example 1. The 30-0-3 bag contains nearly 5 pounds of *actual nitrogen* (0.30 x 17 = 5). This means that each bag can treat 5 units of 1,000 square feet or 5,000 square feet at one pound per 1,000 square feet. Since our 29,000-square-foot turfgrass example has a total of 29 units, that means you will need to purchase six bags to have enough *actual nitrogen* to cover the total area in our example.



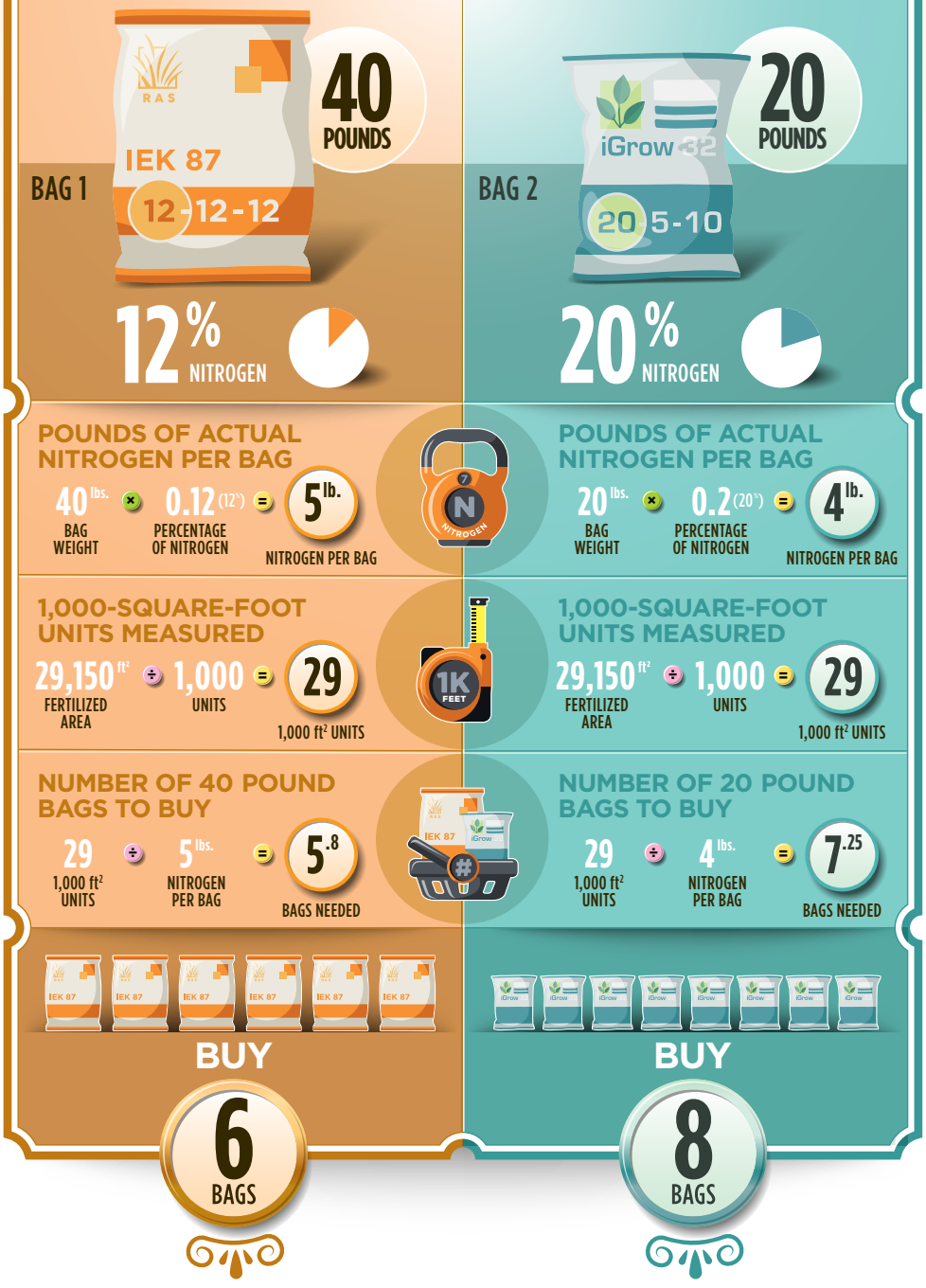
Fertilizer Example 2. The 24-3-12 bag contains 11 pounds of *actual nitrogen* (0.24 x 45 = 11), so it would take three bags to cover your 29,000-square-foot turfgrass area. You will have some left over from the last bag, which you can save for the next application.

Remember: A bag with different weights will have different amounts of nitrogen even if they have the same three-number formula.



How many bags will I need to purchase?

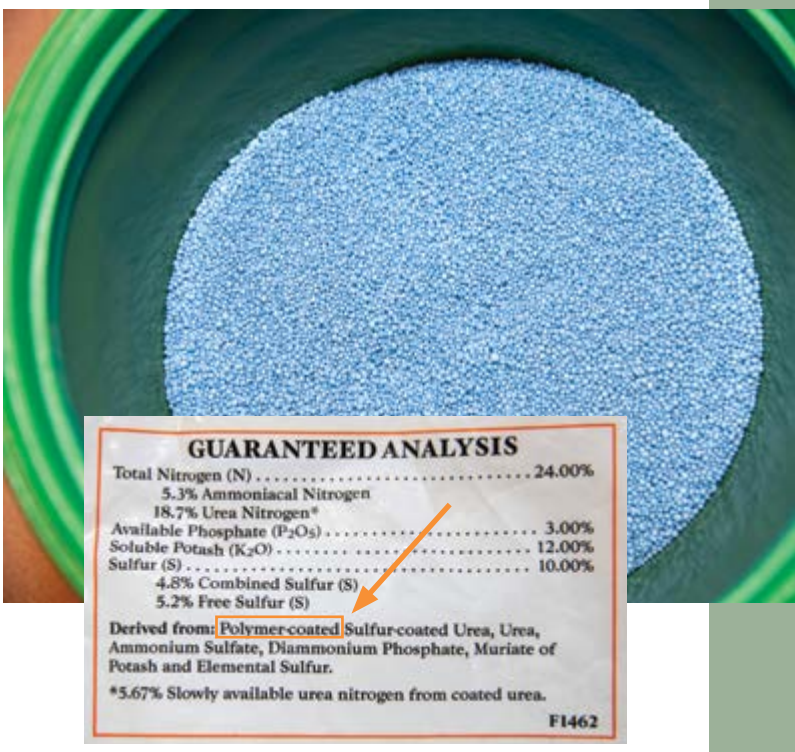
My lawn is 29,150 square feet.



Carry Your Calculator To The Store

At the store, calculate how many pounds of *actual nitrogen* are in the different bags being sold. Then, divide the price of each bag by the pounds of *actual nitrogen* to see how much each pound of nitrogen costs. You will be surprised how much difference there is between the cost of nitrogen between the different brands. Remember, turfgrass cannot distinguish nitrogen from one brand to another.

The complication here (and it could be large) is some fertilizers have a coating around the fertilizer (just like some medications). Coated fertilizers release their nutrients in a more controlled way compared to products that do not have coatings. Slow-release fertilizer is generally more expensive than quick-release. Quick-release fertilizers provide nutrients for four to six weeks. Slow-release fertilizers often feed the plant for six to eight weeks or longer.



Polymer-coated fertilizer products often cost more than other fertilizers. The coating slowly dissolves, releasing nutrients to the turfgrass slowly over time.

Does This Ring True?

You picked up several bags of fertilizer that contained enough nitrogen for your turf. You fill the rotary spreader and begin the application process. The problem becomes quickly evident when the fertilizer runs out long before you fertilize the entire lawn.

What in the world happened? You had enough fertilizer to do the entire property.

What happened was that the spreader was not calibrated. Either the openings on the spreader were opened too much, or the walking speed was too slow. The result to running out is to have to purchase more fertilizer, it could damage the turf, or result in uneven application.

Now you know two-thirds of what it means to deliver *1 pound of actual nitrogen per 1,000 square feet* evenly distributed.

Calibrating the Spreader to Evenly Distribute Fertilizer

The third issue to tackle is the application. What happens if you cannot find the brand of spreader you own on the fertilizer label, and you don't know what letter or number to set the gauge for controlling the gate opening on your spreader?

There are literally hundreds of fertilizer products and hundreds of different spreaders in the marketplace. If the fertilizer label lists your specific spreader brand, the walking speed during application may also be too fast for many of us, or the bag does not provide a target walking speed. In fact, most fertilizer instructions fail to give the walking speed.

Two Commonly Used Spreaders

Dry fertilizers can be applied by two methods: drop spreaders and broadcast spreaders. They may sound the same and look similar, but they are as different as night and day when it comes to the application. Be sure to understand how they operate to make sure you make an accurate application.

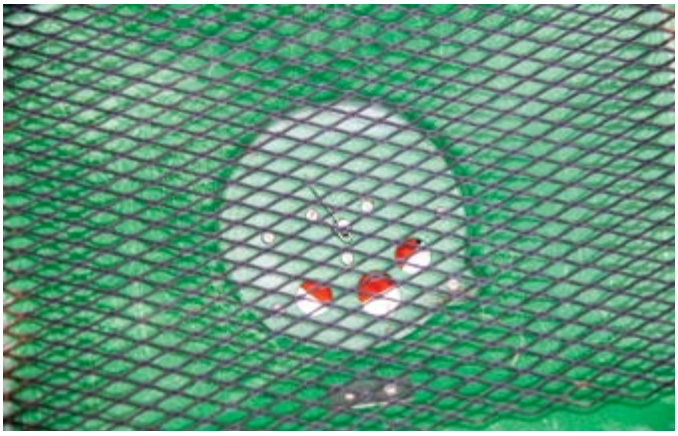
SPREADER SETTINGS	DROP SPREADER SETTINGS	BROADCAST SPREADER SETTINGS
AGRI-FAB	6.0	4.0
AMES	2.5	4.0
AMES DELUXE 2 IN 1	1.5	3.0
CRAFTSMAN	5.5	4.0
EARTHWAY	9.5	11.5
PLANT MATE	1.7	8.0
PRECISION GREENLINE	1.5	3.75
PRECISION RED DEVIL	7.0 (old dial 0 to 14)	6.5 (old dial 0 to 12)
PRECISION RED DEVIL	1.5 (new dial 0 to 5)	3.75 (new dial 0 to 10)
PRECISION PRO	1.5	3.75
SCOTTS SPEEDY GREEN	--	5.75
SCOTTS EASY GREEN	--	26.0
SCOTTS ACCU GREEN	6.5	--
SCOTTS EVEN GREEN	7.5	--
TAYLOR	1.7	8.0

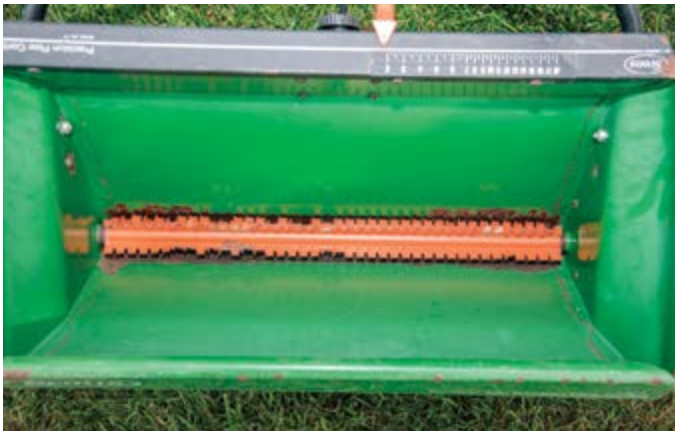
Suggested sprayer settings from a fertilizer bag.















BROADCAST SPREADERS *are widely used for fertilizer applications. The fertilizer in the hopper is gravity fed into the center and passes through the gate openings. In this unit, the higher the letter, the greater the openings will be. In other words, if walking at the same speed, the larger openings will throw out more fertilizer than smaller openings. As fertilizer falls through the openings, it encounters a spinning plate that throws the fertilizer around 7 feet out in front and to the sides of the spreader in a semicircular arc. The spinning plate is activated by the turning of the wheel axle as you push the spreader across the treatment area.*

Broadcast spreaders do not distribute granules uniformly because the spinning plate creates a tapered, fan-shaped pattern. More of the product is distributed in the center of the arc than on either side. This uneven distribution requires that you overlap each pass as you move back and forth across the site. Each pass will be about three steps over from the previous pass. Space your passes to that the fertilizer throws back toward and hits the ground at the wheel tracks of your previous pass. This "wheel-to-wheel" application spacing allows for the correct overlap of the fertilizer and gives your lawn a uniform greening as the fertilizer feeds the turf.

DROP SPREADERS *can also apply dry fertilizers. The fertilizer product is poured into a hopper mounted between the wheels. At the bottom of the hopper is a rotating agitator bar, which stirs the product and keeps it flowing freely and uniformly. The agitator bar is driven by the movement of the spreader's wheels. The fertilizer falls through the adjustable gate openings. The amount of product that falls through the gate is governed by adjusting the openings according to the numbers or letters on the unit. In this example, a larger number produces larger openings for the fertilizer to fall through.*

Notice in the bottom photograph (white arrows) that the gate openings are inside of the wheels. It is important to make the next pass with the wheel slightly on the inside of the previous pass (see the wheel tracks, previous page). Failure to do so will mean a gap where fertilizer will not be applied, leading to streaking in the turf. Fertilized turfgrass will be dark green, while turfgrass without the added nitrogen will be light green.

Conceptually, this is easy to visualize. The gate opening and walking speed are the two things that affect the application rate. The faster you walk, the less fertilizer will be put out given the same spreader opening. Larger spreader openings result in more fertilizer applied. The spreader's setting and application speed are equally important.

It seems a daunting and unsolvable task, but understanding a few basic concepts will help provide you a workable solution. Let's continue with our example in which you need about 29 pounds of *actual nitrogen* to fertilize a 29,000-square-foot turfgrass area. Using a 12-12-12 fertilizer in a 40-pound bag, we calculated the bag has about 5 pounds of *actual nitrogen*. You purchase six bags of the product to apply the recommended rate of *1 pound of actual nitrogen per 1,000 square feet* (5 pounds N x 6 bags = 30 pounds N).

To help prevent under- and overapplication, consider the following example in Figure 3. You have six bags, and each bag will cover five units of 1,000 square feet. Divide up the bags based on nitrogen across the turfgrass areas. Place three bags of the product on the site you have identified as Grass 1. The remaining areas (2, 3, and 4) will need 1.5, 1, and 0.5 bags. Use a couple of 5-gallon plastic buckets to hold and place the partial bags. Using this approach, you know exactly how much fertilizer to put down in each area.

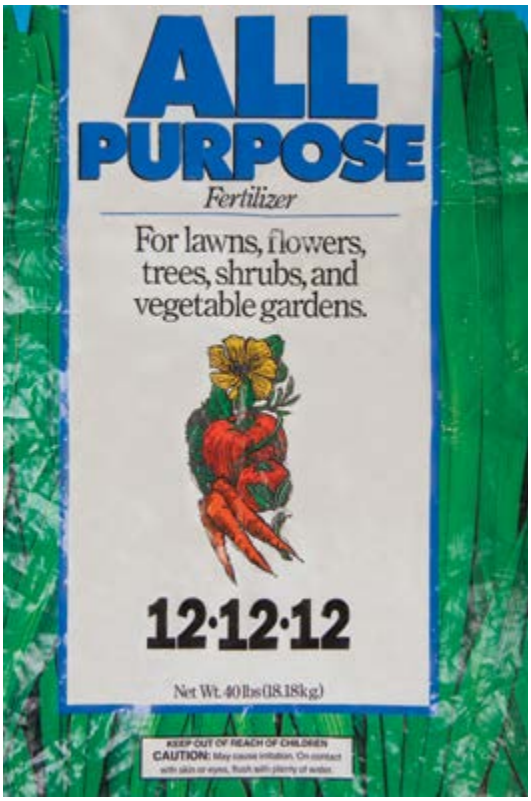


Figure 3





Always pour and measure fertilizer into buckets or your spreader over a hard surface such as pavement. This allows you to easily clean up spills. Spilling fertilizer in the lawn can cause dead spots. After applications, be sure to clean up products that are on sidewalks, driveways, and roads using a broom or blower.

Next, adjust the gate setting so the product comes out slowly, which means the gate setting will be slightly open. As a starting point, turn the setting about ¼ of the way open. You can practice on a short section of your driveway using the spreader with fertilizer to see how fast it is being spread. If it looks like too little or too much fertilizer is coming out, then adjust the lever on the spreader. Remember that this setting is only good for that specific fertilizer based on the shape and size of the dry granules being applied.
If you are using a broadcast spreader, this is also the opportunity to gauge just how much the spreader throws in each direction to know how much space to add between passes. Use the wheels to gauge space between passes. Applying with a smaller gate opening gives you time to cover your area without running out. Go over the turfgrass in a north to south pattern, then go east to west to get the material evenly applied and distributed over the turf. Repeat the process until you run out.

Ideally, you will cover the area at least twice in separate directions. It may take you three or four passes in the first section to apply the allotted fertilizer. While it will take you a little longer to complete the application, the end result is an even distribution. If it takes three or more passes to travel over a lawn section to spread the fertilizer, you can slightly increase the gate opening size before you start the next section.

Does This Example Conjure Up Thoughts Of Past Applications?

You are spreading the fertilizer, and you realize you are running out quicker than you anticipated. You speed up to get the remainder left in the spreader out over a much larger area.
This uneven application means the turfgrass was overfed at the beginning of the application and underfed at the end when you started walking faster.

It should raise a red flag when you run out of fertilizer before you finish covering an area. This means your speed was slower than you practiced and/or the gate setting was opened too much. Speeding up slightly is always an easier approach than trying to reset the gate position. However, it is always better to make more passes than to apply too heavily and run out before you cover the entire area. Clean up any spills that do not land on turfgrass (sidewalks, driveways, and roads).

SPREADER SETTINGS

Model	Setting
Earthway 2000A Rotary	14
Earthway 2050P Rotary	14
Scotts Accugreen 1000 Drop	7 ¾
Scotts Accugreen 2000 Drop	7 ¾
Scotts Accugreen 3000 Drop	7 ¾
Scotts SpeedyGreen 1000 Rotary	5 ¾
Scotts SpeedyGreen 2000 Rotary	5 ¾
Scotts SpeedyGreen 3000 Rotary	5 ¾

What should you do if your spreader is not listed on the fertilizer bag? The method we presented is an easy way to overcome not having the settings to adjust your spreader.

Customizing Your Process for the Perfect Application

Congratulations! You now understand what it means to deliver *1 pound of actual nitrogen per 1,000 square feet* evenly distributed. Customize your fertilizer application by completing the steps below. If you have any problems, just refer to the previous discussion in this publication. Let's review the eight steps to help you deliver *1 pound of actual nitrogen per 1,000 square feet* evenly distributed.

Step 1. Outline the Property (Once Only)

Draw a simple map of your property including house, sheds, sidewalks, driveways, flower beds, patios, decks, and turf.

Step 2. Calculate How Many Feet Are in One Step (Once Only)

Step 3. Measure Each Turfgrass Area (Once Only)

Step 4. Figure Out How Much Fertilizer to Buy (Repeated Each Time)

Once you know how much *actual nitrogen* you will need to apply, determine how much *actual nitrogen* is in each bag. You will need to recalculate each time you purchase a new fertilizer bag with a different nitrogen percentage or weight.

Step 5. Calculate Fertilizer Needs for Each Area (Repeated Each Time)

Determine how much fertilizer you need for each area based on *1 pound of actual nitrogen per 1,000 square feet*.

Step 6. Place The Amount in Each Area (Repeated Each Time)

Place the amount of fertilizer product you need for each area into buckets and place them in each area.

Step 7. Start with a Small Gate Opening (Repeated Each Time)

When applying, set your spreader with a small gate opening and spread the fertilizer over each area. Remember, you may need more than one pass to distribute the fertilizer evenly.

Step 8. Clean Up (Repeated Each Time)

After applying fertilizer, be sure to sweep or blow off any fertilizer on hardscape back into the lawn.

Step 9. Take Notes to Make Future Applications Easier (Repeated Each Time)

Record spreader settings and take notes including, the fertilizer brand and its analysis to make future applications easier.

Blow It Back in the Yard!

Fertilizer polluting streams, waterways, and other water sources is a real concern. Repeated studies have shown that applying fertilizer to lawns in the correct amount reduces this potential source of pollution. Impervious surfaces (such as sidewalks, driveways, streets, parking lots, and other hardscapes) increase stormwater runoff to storm sewers, which flow to natural water resources like streams, rivers, and lakes (bringing any fertilizer left on those impervious surfaces along with it).

To keep fertilizer out of waterways, use a blower (or broom) and simply make a loop around any impervious surfaces to blow or sweep the fertilizer back in the lawn. Do this even if you don't think any fertilizer made it to the concrete, because more than likely, some did. As an added incentive, remember that you paid for the fertilizer, so put it to good use in your lawn and do not waste it by letting it run off from your driveway.





Conclusion

Properly fertilized lawns can provide healthy turfgrass for recreation and can nicely frame residences. Proper fertilizing can also reduce the need for herbicides to control weeds.

Fertilizing your lawn is a bit like cooking your favorite recipe. The final product might be unrecognizable if you miss a single ingredient, measure incorrectly, or use the wrong temperature. Similarly, if you do not apply enough nitrogen on the turfgrass, your lawn may show little response, meaning you wasted both time and money. "Hit and miss" applications may mean weakened turfgrass might suffer additional setbacks from weeds, insects, diseases, drought, and traffic.

Hopefully, you now understand the important facts behind the recommendation of *1 pound of actual nitrogen per 1,000 square feet evenly distributed by a calibrated spreader*. While this is the go-to recommendation, understanding bag size, formulation percentages, square footage, and spreader calibration all come to play when trying to put the right amount of fertilizer on turf. By following the easy-to-follow steps outlined here, your turfgrass will respond in ways you never imagined.



Establishing beautiful turfgrass around your property is possible if you are willing to put in the work. Mowing at the right height, planting the right variety, keeping the turfgrass well-watered, and applying the proper rate of fertilizer at the right time all go together to produce a healthy and beautiful turfgrass stand. Do not forget to sweep or blow fertilizer granules on driveways and sidewalks back into the turf to keep the product out of surface water.

1 POUND OF *ACTUAL NITROGEN* PER 1,000ft²

Lawn success depends on a perfect balance of measurement, calibration, and calculation



WORKSHEET (Property Information)

Step 1: Outline the Property.

Draw a simple map of your property including house, sheds, sidewalks, driveways, flower beds, patios, decks, and turf.

Step 2: Calculate How Many Feet Are in One Step.

- Take five paces (steps) and note where you started and stopped
- Measure the distance (in feet) between the start and stop of your five paces
- Divide the number of feet by 5 to determine the average distance (in feet) of each pace
- _____ (length of 5 paces in feet) ÷ 5 = _____ (distance per pace in feet)

Step 3: Measure Each Turfgrass Area.

Separately measure each turfgrass area by counting the number of steps, convert the steps to feet, calculate the square feet in the area, and then determine the number of 1,000-square-foot units.

Area #	Length (paces)	Width (paces)	Number of Feet per Pace	Length (feet)	Width (feet)	Square Footage (ft^2)	Number of 1,000-Square-Foot Segments
Example	*78*	*44*	*2*	*156*	*88*	*13,728 (156 × 88)*	*13.7 or about 14*
Total							

For additional copies of these worksheets, visit the Purdue Pesticide Programs website, ppp.purdue.edu, and look for publication number PPP-155.

WORKSHEET (Fertilizer and Spreader Information)

Step 4: Figure Out How Much Fertilizer to Buy.

Once you know how much actual nitrogen you will need to apply, determine how much actual nitrogen is in each bag. You will need to recalculate each time you purchase a new fertilizer bag with a different nitrogen percentage or weight.

Product Name: _____ Product Brand: _____ Store Purchased: _____

Fertilizer Analysis (three digits): ____ – ____ – _____ Bag Weight: _____ pounds

Actual nitrogen in one bag: _____ (% nitrogen) × _____ (bag weight) = _____ pounds N

Product Name: _____ Product Brand: _____ Store Purchased: _____

Fertilizer Analysis (three digits): ____ – ____ – _____ Bag Weight: _____ pounds

Actual nitrogen in one bag: _____ (% nitrogen) × _____ (bag weight) = _____ pounds N

Step 5: Calculate Fertilizer Needs for Each Area.

Determine how much fertilizer you need for each area based on *1 pound of actual nitrogen per 1,000 square feet*.

Area #	Square Footage (ft^2)	Number of 1,000-Square-Foot Segments	Amount of *Actual Nitrogen* Needed in This Section (pounds)	Pounds of *Actual Nitrogen* in Each Bag (answer from step 4)	Number of Bags Needed in this Section (divide column 4 by column 5)
Example	*13,728*	*13.7 or about 14*	*14*	*4.8 or nearly 5*	*2.91 or nearly 3 bags (14 ÷ 4.8 = 2.91 bags)*

Step 6: Place The Amount in Each Area.

Place the amount of fertilizer product you need for each area (calculated in Step 5) into buckets and place them in each area.

Step 7: Start with a Small Gate Opening.

When applying, set your spreader with a small gate opening and spread the fertilizer over each area. Remember, you may need more than one pass to distribute the fertilizer evenly. Note the final setting here that worked well for the fertilizer used in step 4 _____.

Step 8: Clean Up.

Sweep or blow off fertilizer from hardscapes back into lawn.

Step 9: Take Notes to Make Future Applications Easier.

Keep a copy of this worksheet in your garage, shed, or files to:

1. Recall the size of your lawn
2. Recall what fertilizer you used last time
3. Record any notes about the fertilizer spreader and amounts you used in each section of your lawn

Record details about your application to improve your success in the future.

Application Date: _____

Gate Setting: _____

How did it go? _____

_____

_____

_____

Is there anything else I want to remember when I do this next time?_____

Was I satisfied with the result? _____

How did my lawn look 2, 4, and 6 weeks later? _____

_____

_____

If you can use the same fertilizer the next time, then you have a very good starting point for your calibration to make things very easy.

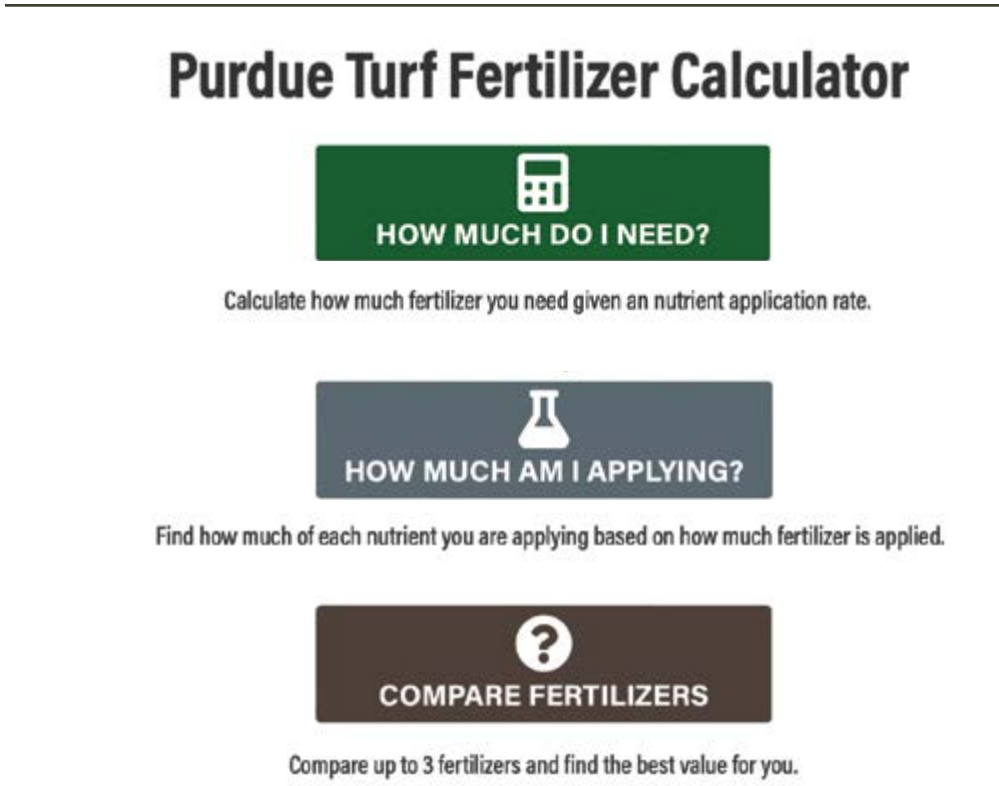
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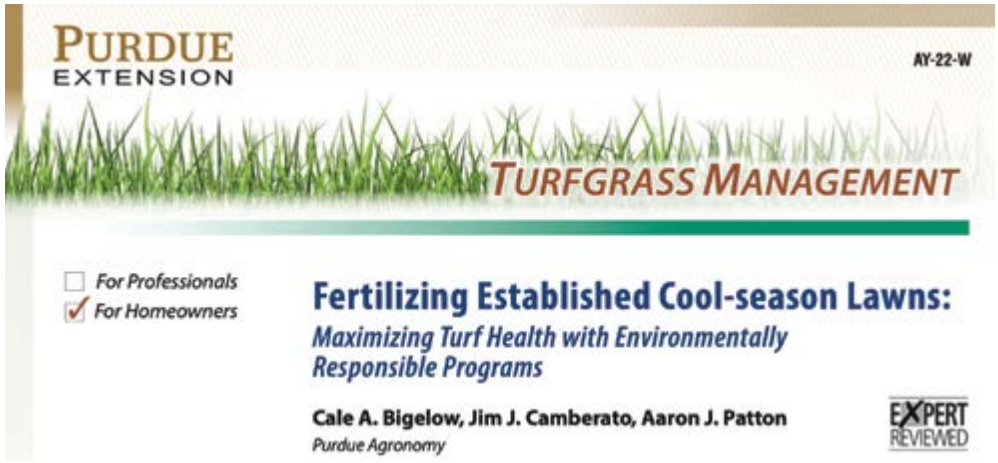
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The Purdue University Turfgrass program has developed a "plug the numbers in" calculator that will help you through the math process. We thought it was important that you understand how to do the math before using the calculator.

Purdue Turf Calculator — turf.purdue.edu/fertilizer-calculator



For more information about fertilizing your lawn, including which seasons to make applications, see ***Fertilizing Established Cool-season Lawns: Maximizing Turf Health with Environmentally Responsible Programs*** (Purdue Extension publication AY-22-W) available from the Purdue Extension Education Store, edustore.purdue.edu.



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