



# Calibrating and using lawn fertilizer and lime spreaders

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For a successful fertilizer program, you must apply the recommended rate of fertilizer evenly over your lawn. The only way to ensure that you're applying the correct rate is to calibrate the spreader.

An uncalibrated spreader may apply too much or too little lime or fertilizer. Shortages and excesses not only waste time, material, and money, but they can quickly lead to a decline in the quality of your lawn.

For example, too little nitrogen, phosphorus, or potassium results in a thinner lawn and greater weed and disease problems. On the other hand, too much nitrogen results in excessive top growth at the expense of roots. Turfgrass with lush top growth is more susceptible to disease and, because of less rooting, requires more frequent watering. Excessive or improper fertilizer applications also can injure or "burn" turf.

This publication discusses types of fertilizer and lime spreaders, how to calibrate these spreaders, how to determine the amount of fertilizer or lime to use on your lawn, and how to avoid application problems.

## Types of spreaders

There are two basic types of spreaders—*spinner* or *rotary spreaders* and *drop spreaders*.

A spinner spreader applies fertilizer or lime across a path 4–8 ft wide, depending on the spinner's velocity and the size and density of the particles.

One disadvantage of spinner spreaders occurs if the fertilizer that you use contains materials with different particle sizes or densities—the spreader will throw the larger, denser particles farther than the finer, lighter particles. Thus, it is hard to distribute the different materials uniformly, and less fertilizer is applied the farther you get from the center. With this type of spreader it is also more difficult to see where you applied fertilizer or lime in the last pass so that you adequately overlap it.

Conversely, spinner spreaders dovetail or feather the material from each successive pass so that streaking due to non-uniform application usually is not as obvious.

A drop spreader, like its name states, applies fertilizer or lime directly beneath the spreader. Uniform fertilizer application tends to be more of a problem with drop spreaders than with spinner spreaders because you have to overlap successive passes to avoid light green stripes in the lawn, and if the spreader is not properly calibrated, this type of spreader may increase the risk of burning.

## Calibrating a spreader

Calibrating a spreader is relatively simple. These steps are used to calibrate a hand-pushed or power-drawn spinner spreader or drop spreader.

### 1. Determine how much fertilizer or lime you need to apply in a single pass with the spreader.

**a. Lime:** Lime should be applied only when determined necessary through soil testing. The soil test report gives lime recommendations in pounds per 1,000 ft<sup>2</sup>. Applying more than 50 lb/1,000 ft<sup>2</sup> at any one time risks burning the grass. Therefore, if more is needed, it should be applied in two or more applications. When the lime recommendation is for less than 50 lb/1,000 ft<sup>2</sup>, calibrate the spreader to apply that amount. For recommendations of greater than 50 lb/1,000 ft<sup>2</sup> calibrate the spreader for the split rate you will apply each time. Lime is best applied in early spring or late fall.

**b. Fertilizer:** Fertilizer rates are based on the amount of nitrogen recommended for each application (see table 1) and the nitrogen content of the fertilizer you are going to apply. You need to calculate the amount of fertilizer required. For example, if the recommendation is

**Table 1. Suggested nitrogen application dates and rates**

Applications per season	Nitrogen rate per application (lb/1,000 ft <sup>2</sup> )	Application dates
1	1.0	mid- to late October
3*	1.0	late May/early June early September mid- to late October
4	1.0	late May/early June early to mid-July early September mid- to late October (after last mowing)

\*Recommended for grass grown in shade, apply 0.5 lb of nitrogen per 1,000 ft<sup>2</sup>.

for 1.0 lb N/1,000 ft<sup>2</sup> and the fertilizer contains 29% nitrogen, then:

$$\text{Fertilizer rate} = \frac{1.0 \text{ lb N}/1,000 \text{ ft}^2}{29 (\% \text{ N})} \times 100 = 3.4 \text{ lb}/1,000 \text{ ft}^2$$

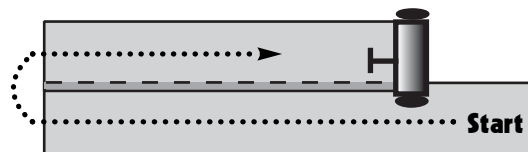
The spreader needs to be calibrated to deliver 3.4 lb fertilizer/1,000 ft<sup>2</sup> in a single pass. If you elect to apply the fertilizer in two passes to ensure uniform application (see methods B and C in figure 1), the fertilizer needs to be applied at half the above amount (in this example, 1.7 lb/1,000 ft<sup>2</sup>) and calibrate the spreader for this amount.

CAUTION: When using a drop spreader, the rate of fertilizer application is uniform only if the opening through which the fertilizer falls is at least as large as the largest particles in the fertilizer. If you calibrate the spreader for the half rate and the fertilizer contains particles too large to pass through the spreader at this calibration, recalibrate the spreader to apply the fertilizer in a single pass.

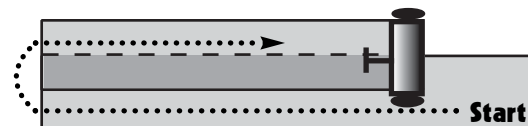
2. **Select a site for calibrating the spreader** that is off the area you will treat; for example, a driveway.
3. **Spread a 25-ft long piece of plastic sheeting** over the area to collect the fertilizer or lime. The plastic should be 5–10 ft wide for a spinner spreader and 3–5 ft wide for a drop spreader.
4. **Mark off a distance of 20 ft on the plastic sheet.**
5. **Set the opening of the spreader for the desired rate** using one of the following options:
  - a. follow instructions given in the operator's manual that came with the spreader, or

**Figure 1. Methods for evenly applying fertilizer or lime.**

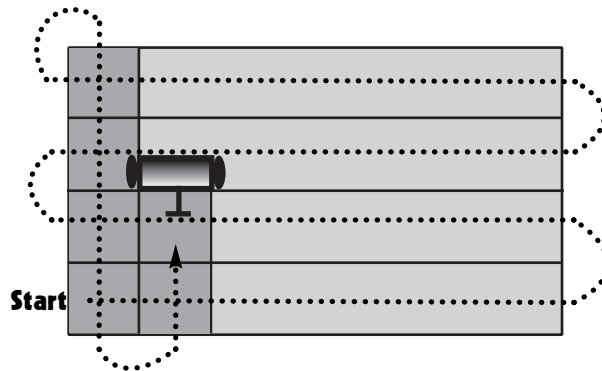
**Method A:** Apply full rate in a single pass; overlap slightly to prevent striping.



**Method B:** Apply at half the recommended rate using 50% overlap.



**Method C:** Apply at half the recommended rate in two directions.



- b. follow information given on the fertilizer bag (not all fertilizer bags have this), or
- c. adjust the spreader opening to a size slightly larger than the largest of the fertilizer or lime particles being applied.

6. **Put a known weight of fertilizer or lime into the hopper.** Use at least 20 lb of material in hand-pushed spreaders and 80 lb in power-drawn models.
7. **Make four passes** in the same stretch with the spreader (or a total of 80 ft). Travel at the same speed you will use on your lawn, and turn the spreader on and off at the beginning and end of each pass.
8. **Record the distance from the center** that a spinner spreader throws the fertilizer or lime. With a drop spreader, measure the width of the spreader box in inches and divide by 12 so that the units are in feet.

- 9. Determine the amount of fertilizer or lime applied** using one of the following techniques:
- weigh the fertilizer or lime left in the hopper and subtract this from the total amount added, or
  - collect and weigh the fertilizer or lime on the plastic sheet.

**10. Calculate the application rate** as pounds of material applied per 1,000 ft<sup>2</sup> using the following formula:

$$\text{Application rate} = \frac{\text{pounds of material applied (Step 9)} \times 1,000}{4 \text{ passes} \times \text{distance traveled in ft (Step 7)} \times \text{lateral spread in ft (Step 8)}} =$$

**11. Adjust the spreader opening** if the calculated rate is not within 10% of the desired rate and make another test run. Usually, you will not need to make more than one or two reruns to calibrate the spreader. Remember, different materials may need different settings, and you should calibrate each separately because of differences in density and/or particle size.

**12. After calibrating the spreader,** set it to deliver half the desired rate of fertilizer or lime and either go over the area twice (at right angles to each other) or overlap each pass by 50% (see figure 1). This will distribute the material evenly and help avoid light-green stripes in the lawn. If the particles are too large to pass through the spreader when set at the half rate, apply the full rate in a single pass. Overlap slightly to prevent striping.

**13. Clean the spreader** after each use and periodically oil and inspect it for worn or loose parts.

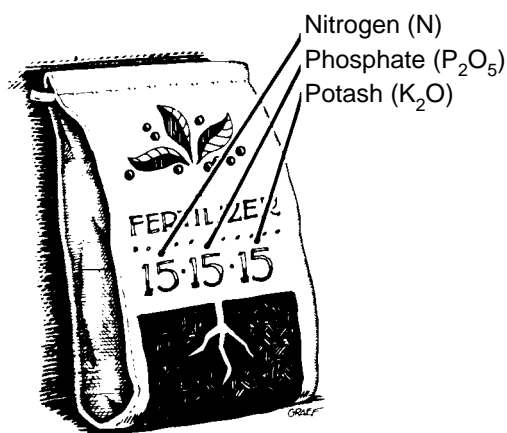
#### Calculation example:

Suppose that your spinner spreader throws fertilizer or lime 4 ft (Step 8). During four 20-ft passes (Step 7) you applied a total of 1.6 lb (Step 9) of material. To calculate the rate of application, use the following equation.

$$\text{Application rate} = \frac{1.6 \text{ lb} \times 1,000}{4 \text{ passes} \times 20 \text{ ft} \times 4 \text{ ft}} = 5 \text{ lb}/1,000 \text{ ft}^2$$

To convert the resulting amount into pounds per acre, multiply the result by 43.6. Thus, 5 lb/1,000 ft<sup>2</sup> converts to 218 lb/a (5 x 43.6 = 218).

**Figure 2. The fertilizer grade or analysis is designated by three numbers which are always listed in the same order.**



## Determining your lawn's fertilizer and lime needs

The only way to accurately determine how much phosphate, potash, and lime your lawn needs is to have your soil tested.

For information on how to take soil samples and where to have them analyzed, see Extension publication *Sampling Lawn and Garden Soils* (A2166).

After your soil is tested, you will receive a soil test report that tells you how much lime, and what kinds of fertilizer to use on your lawn.

## Preventing lime and fertilizer application problems

If you take a few precautions, you can avoid some common problems that may occur when applying fertilizer or lime.

- Mow the grass 2–3 days before fertilizing. This way the mower tracks are no longer visible so you do not confuse them with spreader tracks.
- Fertilize turf when it's dry. Lime and fertilizer particles cling to wet grass and may cause burning.

- If using method B or C (from figure 1) for a drop spreader, remember to set the spreader to deliver half the desired rate of fertilizer or lime and either go over the area twice (at right angles to each other) or overlap each pass by 50% to avoid streaks in the lawn.
- If using a rotary spreader, overlap adjacent passes by 10% of the width of application.
- Be careful when using blended fertilizers as they may segregate into their individual components, especially at low rates of application and if particle size or density of the individual ingredients vary. Spinner spreaders will throw the heavy particles farther than the light particles.
- Use spinner spreaders only on still days. On windy days, your neighbor may receive more benefit from the fertilizer than you do.

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