

# How to Read Fertilizer Numbers



Fertilizer bags have a set of numbers that contain important information. While the numbers may vary – 10-10-10 or 18-6-12 or some other ratio, for example – they always represent the same three nutrients and the percentage of each: Nitrogen (N), Phosphorous (P), and Potassium (K). The percentage of NPK is always in the same order on every bag.

## Reading a fertilizer bag's contents

Take, for example, a 40-pound bag of 10-20-10 all-purpose fertilizer. It contains 10 percent nitrogen, 20 percent phosphorous, and 10 percent potassium. To determine the pounds of each nutrient in the bag, simply multiply the bag weight (40 pounds) by the percentage of each nutrient. The bag would have 4 pounds of nitrogen, 8 pounds of phosphorous (in the form of phosphate), and 4 pounds of potassium (in the form of potash). That leaves 24 pounds in the bag which is likely some type of filler such as sand or limestone, which makes it easier to **spread the fertilizer**.

If the label states that the bag is a “complete” fertilizer, that means it contains Nitrogen, Phosphorus, and Potassium. While an “incomplete” fertilizer may contain some combination but not all of these, it’s generally best to use a complete fertilizer, particularly if you have not had your soil tested.

### What do the 3 numbers on fertilizer mean?

Why are Nitrogen, Phosphorus and Potassium so important? It all has to do with plant growth.

- **Nitrogen** promotes green leafy growth
- **Phosphorous** is needed for strong root growth and producing blooms and fruit
- **Potassium** contributes to the general health of the plant and helps improve stress tolerance of the plant

## How do I know what fertilizer to use

The numbers also provide clues as to which fertilizer may be best for certain needs in the lawn and **garden**. Fertilizers such as 10-10-10 or 13-13-13 are considered all-purpose and are good to use for your garden. Illinois Extension recommends 1 ½ pounds of these fertilizers for every 100 square feet of garden. A higher nitrogen number such as 20-5-5 may be best for lawns. A **fertilizer** with a higher content of phosphorous, such as 10-30-20, is often used for plants that bloom.

## Is fertilizer bad for the planet

The best way to use fertilizer wisely is to conduct a soil test, which will supply recommendations on what nutrients and how much may need to be added to your **soil for best plant growth**. Your county Extension office often offers soil test kits for free or for a nominal charge.

The overuse of fertilizer is a growing concern. It can result in runoff, which can contaminate water, result in algal blooms and disrupt aquatic life. An application of too much fertilizer can also be damaging to plants. A better understanding of how to correctly read a fertilizer bag and getting a soil test lessens the risks of applying too much fertilizer. Another way to reduce fertilizer requirements is to amend your **soil** on a regular basis with compost and other organic material.



---

## Application rates and bag information

While small bags of all-purpose fertilizer or fertilizer for specific type plants often provide suggestions for amounts to apply to **trees and shrubs** and other **plants**, it's often more challenging when you are faced with 20- or 50-pound bags of fertilizer, each with different numbers, and none telling you exactly how many pounds of that particular product you will need for your size lawn.

In the absence of a soil test, Extension recommendations are often to apply one pound of nitrogen per 1,000 square feet of lawn. When you get to the garden section of **your favorite store**, it is easy to get overwhelmed by all the different numbers on fertilizer bags: 6-2-0, 10-10-10, 14-3-6, 20-5-5, 26-3-4, 35-3-5 are all common to find. The best advice is to stick with the formula and do a little math.

## Formula for fertilizer amount

**Calculate the total square feet of your lawn, then divide by 1,000 because you need fertilizer at the rate of 1 pound of nitrogen per every 1,000 square feet.**

For example, if you have a 5,000-square-foot lawn, divide it by 1,000, which equals 5 pounds of actual Nitrogen needed.

**Calculate percentage of nitrogen in the bag. To find out how much product it takes to apply 1 pound of nitrogen, divide 1 pound by the percentage of nitrogen in the bag.**

Say the fertilizer is labeled 26-3-4. The first number is nitrogen, which means the bag has 26% of this mineral. (1 pound divided by .26 = 3.85 or just under 4 pounds of 26-3-4 product per 1,000 square feet.)

**Multiply the calculation in #1 by the calculation in #2.**

$5 \times 3.85 = 19.25$  pounds; therefore, you would need approximately 20 pounds of 26-3-4 for your 5,000-square-foot lawn.

## Types of fertilizers

Knowing what the numbers mean is one piece of the puzzle, the other piece is know what the three types of **plant fertilizers** there are. Here's a quick breakdown.

### Quick release or slow release

Two terms you may see are "quick release" or "slow release." Quick release feeds the plants all at once and slow release feeds the plants for an extended period, generally three to four months. Either or a combination may be used. Maryland Extension says slow release is less likely to leach out of the soil.

### Organic options

If you prefer an **organic fertilizer** rather than synthetic, many options are available. They are made from composted or processed animal or plant waste products such as alfalfa meal, cottonseed meal, soybean meal, fish fertilizers, bloodmeal, bonemeal, or composted manure. Read the label for information on the source of the "organic" nitrogen.