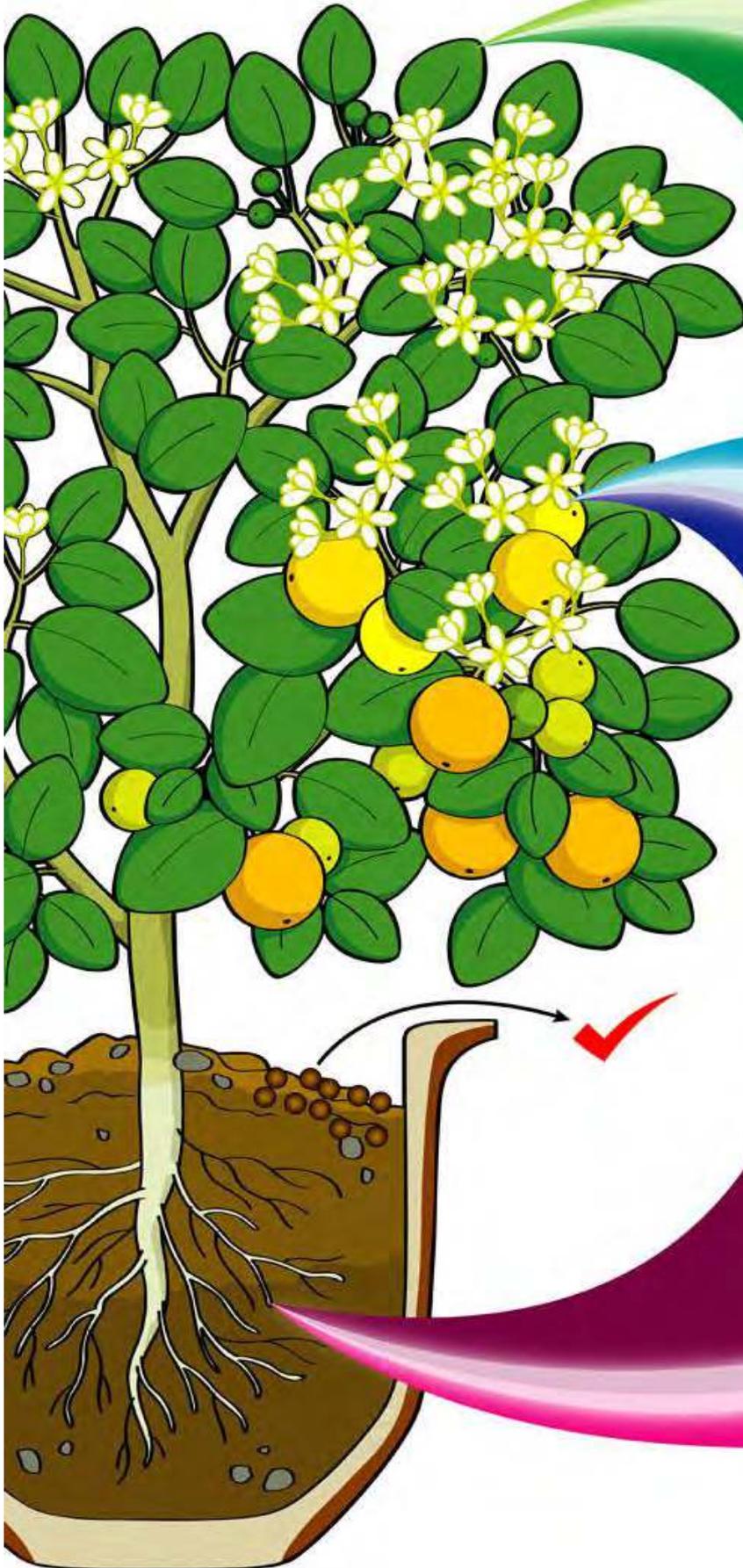


# NPK Definition



## THE LEAF MAKER

### NITROGEN **N**

- Production of new cells and enzymes.
- Production of green pigments.
- Responsible for leaf and stem growth.
- Helps plants with rapid growth.

## THE FLOWER INDUCER / FRUIT MAKER

### POTASSIUM **K**

- Encourages uptake of water.
- Essential in the development of flowers and fruits.
- Increases plants resistance to diseases.
- Helps plants make better use of light and air.

## THE ROOT MAKER / FLOWER INDUCER

### PHOSPHORUS **P**

- Encourages root growth and blooming.
- Essential part of the process of photosynthesis.
- Involved in the formation of all oils, sugars and starches.
- Helps with the transformation of solar energy into chemical energy.

# Fertilizer Numbers – What Is NPK

Standing in the fertilizer aisle of a garden or farm store, you are faced with a dizzying array of fertilizer options, many with a series of three numbers like 10-10-10, 20-20-20, 10-8-10 or many other combinations of numbers. You may be asking yourself, “What do the numbers on fertilizer mean?” These are NPK values, which leads to the next question of, “What is NPK?” Keep reading to learn more about fertilizer numbers and NPK.

## What Do the Numbers on Fertilizer Mean?

The three numbers on fertilizer represents the value of the three macro-nutrients used by plants. These macro-nutrients are nitrogen (N), phosphorus (P) and potassium (K) or NPK for short.

The higher the number, the more concentrated the nutrient is in the fertilizer. For example, numbers on fertilizer listed as 20-5-5 has four times more nitrogen in it than phosphorus and potassium. A 20-20-20 fertilizer has twice as much concentration of all three nutrients than 10-10-10.

The fertilizer numbers can be used to calculate how much of a fertilizer needs to be applied to equal 1 pound of the nutrient you are trying to add to the soil. So if the numbers on the fertilizer are 10-10-10, you can divide 100 by 10 and this will tell you that you need 10 pounds of the fertilizer to add 1 pound of the nutrient to the soil. If the fertilizer numbers were 20-20-20, you divide 100 by 20 and you know that it will take 5 pounds of the fertilizer to add 1 pound of the nutrient to the soil.

A fertilizer that contains only one macro-nutrient will have “0” in the other values. For example, if a fertilizer is 10-0-0, then it only contains nitrogen.

These fertilizer numbers, also called NPK values, should appear on any fertilizer you purchase, whether it is an organic fertilizer or a chemical fertilizer.

## What is NPK and Why is it Important?

So now that you know what the numbers on fertilizer mean, you need to know why NPK is important to your plants. All plants need nitrogen, phosphorus and potassium to grow. Without enough of any one of these nutrients, a plant will fail.

**Nitrogen (N)** – nitrogen is largely responsible for the growth of leaves on the plant.

**Phosphorus (P)** – Phosphorus is largely responsible for root growth and flower and fruit development.

**Potassium (K)** – Potassium is a nutrient that helps the overall functions of the plant perform correctly.

Knowing the NPK values of a fertilizer can help you select one that is appropriate for the type of plant you are growing. For example, if you are growing leafy vegetables, you may want to apply a fertilizer that has a higher nitrogen number to encourage leafy growth. If you are growing flowers, you may want to apply a fertilizer that has a higher phosphorus number to encourage more blooms.

Before you apply fertilizer to your garden beds, you should have your soil tested. This will also help you determine what balance of fertilizer numbers will be appropriate for your garden’s soil needs and deficiencies.

# Understanding Nitrogen Requirements For Plants

Understanding nitrogen requirements for plants helps gardeners supplement crop needs more effectively. Adequate nitrogen soil content is necessary for healthy plants. All plants require nitrogen for healthy growth and reproduction. More importantly, plants use nitrogen for photosynthesis. While native plants are better adapted to their surroundings and oftentimes less affected by nitrogen deficiency, in plants such as vegetable crops, supplemental nitrogen may be required.

## Nitrogen Deficiency in Plants

Good crops depend on an adequate supply of nitrogen. Most nitrogen is naturally present in the soil as organic content. Nitrogen deficiency in plants is more likely to occur in soils that are low in organic content. However, nitrogen loss due to erosion, runoff and leaching of nitrate can also cause nitrogen deficiency in plants.

Some of the most common symptoms of nitrogen deficiency in plants include the yellowing and dropping of leaves and poor growth. Flowering or fruit production may also be delayed.

## Nitrogen Requirements for Plants

As organic matter decomposes, nitrogen is slowly converted to ammonium, which is absorbed by plant roots. Excess ammonium is turned into nitrate, which plants also use to produce protein. However, unused nitrates remain in the groundwater, resulting in leaching of the soil.

Since nitrogen requirements for plants vary, supplemental nitrogen fertilizer should only be used in the correct proportion. Always check the nitrogen analysis on chemical fertilizer packaging to determine the percentage amount of nitrogen present. This is the first of three numbers on the package (10-30-10).

## Raising Soil Nitrogen

There are several ways to add nitrogen to soil. Supplemental nitrogen is usually provided by using organic or chemical fertilizers. Plants obtain nitrogen through compounds containing ammonium or nitrate. Both of these can be given to plants through chemical fertilizers. Using chemical fertilizer to add nitrogen to soil is faster; however, it is more prone to leaching, which can be harmful to the environment.

Building up levels of organic matter in the soil is another way of raising soil nitrogen. This can be achieved by using organic fertilizer in the form of compost or manure. Growing legumes can also supplement soil nitrogen. Although organic fertilizer must be broken down in order to release compounds containing ammonium and nitrate, which is much slower, using organic fertilizer <sup>[6]</sup>to add nitrogen to soil is safer for the environment.

## High Nitrogen in Soil

Too much nitrogen present in the soil can be just as harmful to plants as too little. When there is high nitrogen in soil, plants may not produce flowers or fruit. As with nitrogen deficiency in plants, the leaves may turn yellow and drop. Too much nitrogen can result in plant burning, which causes them to shrivel and die. It can also cause excess nitrate to leach into groundwater.

All plants need nitrogen for healthy growth. Understanding the nitrogen requirements for plants makes it easier to meet their supplement needs. Raising soil nitrogen for garden crops helps produce more vigorous-growing, greener plants.

# The Importance Of Phosphorus In Plant Growth

The function of phosphorus in plants is very important. It helps a plant convert other nutrients into usable building blocks with which to grow. Phosphorus is one of the main three nutrients most commonly found in fertilizers and is the “P” in the NPK balance <sup>[1]</sup> that is listed on fertilizers. Phosphorus is essential to a plant’s growth, but what does it mean if you have high phosphorus in your soil or a phosphorus deficiency? Keep reading to learn more about the importance of phosphorus in plant growth.

## Phosphorus Deficiency in the Soil

How can you tell if your garden has a phosphorus deficiency? The easiest way to tell is to look at the plants. If your plants are small, are producing little or no flowers, have weak root systems or a bright green or purplish cast, you have a phosphorus deficiency. Since most plants in the garden are grown for their flowers or fruit, replacing phosphorus in the soil if it is lacking is very important.

There are many chemical fertilizers that can help you with replacing phosphorus and getting a good nutrient balance in your soil. When using chemical fertilizers, you will want to look for fertilizers that have a high “P” value (the second number in the fertilizer rating N-P-K).

If you would like to correct your soil’s phosphorus deficiency using organic fertilizer, try using bone meal or rock phosphate. These both can help with replacing phosphorus in the soil. Sometimes, simply adding compost to the soil can help plants be better able to take up the phosphorus that is already in the soil so consider trying that before you add anything else.

Regardless of how you go about replacing phosphorus in the soil, be sure not to overdo it as extra phosphorus can run off into the water supply and become a major pollutant.

## High Phosphorus in Your Soil

It’s very difficult for a plant to get too much phosphorus due to the fact that it’s difficult for plants to absorb phosphorus in the first place.

There’s no understating the importance of phosphorus in plant growth. Without it, a plant simply cannot be healthy. The basic function of phosphorus makes it possible to have beautiful and abundant plants in our gardens.

# Plants And Potassium: Using Potassium And Potassium Deficiency In Plants

Plants and potassium is actually a mystery to even modern science. The effects of potassium on plants is well known in that it improves how well a plant grows and produces but exactly why and how is not known. As a gardener, you do not need to know the why and how in order to be hurt by a potassium deficiency in plants. Keep reading to learn more about how potassium affects the plants in your garden and how to correct a potassium deficiency.

## Effects of Potassium on Plants

Potassium is important to plant growth and development. Potassium helps:

- Plants grow faster
- Use water better and be more drought resistant
- Fight off disease
- Resist pests
- Grow stronger
- Produce more crops

With all plants, potassium assists all functions within the plant. When a plant has enough potassium, it will simply be a better overall plant.

## Signs of Potassium Deficiency in Plants

Potassium deficiency in plants will cause a plant to perform more poorly overall than it should. Because of this, it can be difficult to see specific signs of potassium deficiency in plants.

When severe potassium deficiency happens, you may be able to see some signs in the leaves. The leaves, especially older leaves, may have brown spots, yellow edges, yellow veins or brown veins.

## What is in Potassium Fertilizer?

Potassium fertilizer is sometimes called potash fertilizer. This is because potassium fertilizers often contain a substance called potash. Potash is a naturally occurring substance that occurs when wood is burned away or can be found in mines and the ocean.

While potash is technically a naturally occurring substance, only certain kinds of potassium fertilizers containing potash are considered organic.

Some sources refer to high potassium fertilizer. This is simply a fertilizer that is exclusively potassium or has a high "K" value.

If you wish to add potassium to your soil at home, you can do so in several ways without having to use potash or other commercial potassium fertilizer. Compost made primarily from food byproducts is an excellent source of potassium. In particular, banana peels are very high in potassium.

Wood ash can also be used, but make sure that you apply wood ash only lightly, as too much can burn your plants.

Greensand, which is available from most nurseries, will also add potassium to you garden.

Because potassium deficiency in plants can be hard to spot through looking at the plant, it's always a good idea to have your soil tested before adding more potassium.