

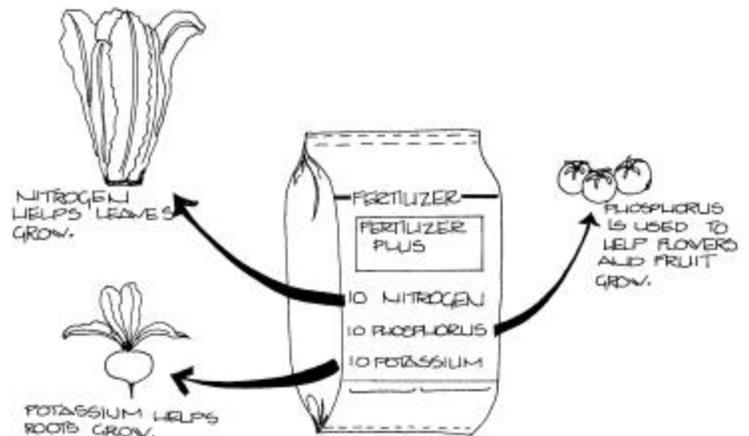
Help Sheets: Fertilizing

All plants must have nutrients to use for living and growing, including building leaves, stems, roots, and flowers. Plants get their nutrients from the soil.

The three main nutrients that plants need are nitrogen (N), phosphorus (P), and potassium (K). These nutrients are called **macronutrients** because plants need these nutrients in large amounts. There are several more macronutrients, but these three are usually the major components of fertilizer. Plants require these macronutrients for good health just like your body needs proteins and carbohydrates from the foods you eat.

Each nutrient does different things for plants. Look at the picture to read what each macronutrient in this fertilizer does for plants.

Plants need some other nutrients, such as copper, iron, and zinc, in much smaller amounts. These nutrients are required for plant growth, but since they are not needed in large quantities they are called **micronutrients**. They are just like the vitamins and minerals that your body needs.



Why do my plants need fertilizer?

Usually nutrients are supplied naturally by garden soil. But if you are growing plants in a container or if you are growing vegetables in the same garden year after year, your soil may begin to lose one or more nutrients. To put nutrients back into the soil we add fertilizers to the soil. Fertilizers contain macronutrients and micronutrients for the plants to use.

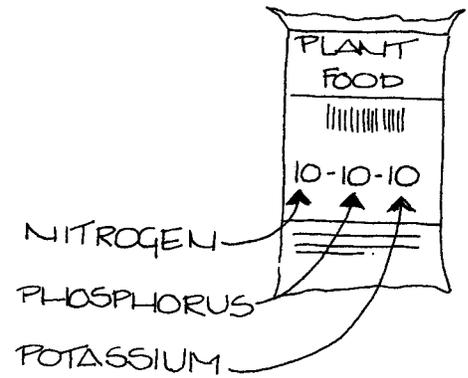
What is a fertilizer?

A fertilizer is a material that you can add to your soil to put nutrients in to the soil. If you look at a fertilizer label, you will see three numbers, for example: 10-10-10

This is the N-P-K value. The order is always the same, and it means this fertilizer contains:

- 10% N (nitrogen)
- 10% P (phosphorus)
- 10% K (potassium)

The label will also list the micronutrients that are included in the fertilizer. Not all fertilizers contain all of the micronutrients.



What kind of fertilizer can I use?

You can use either organic or inorganic (synthetic) fertilizers.

1. Inorganic fertilizers require much care when using them. Too much of these fertilizers can 'burn' your plants' roots by providing too many nutrients all at once. Types of inorganic fertilizers that you might use are:

- **Liquid inorganic fertilizers**
Usually found in a concentrated form and must be mixed with water. They work the fastest because the nutrients are absorbed by the roots along with the water.
- **Powdered inorganic fertilizers**
These are the most commonly used fertilizers for seedlings, houseplants, and container gardens. These fertilizers are dry and must be mixed with water.
- **Granular fertilizers**
A dry material that looks like kitty litter and is usually **broadcast** (scattered on the surface of the soil) or **side-dressed** (placed on the ground along the side of the plant) in the garden. These fertilizers can also be mixed into the soil before planting. Nutrients are available to the plant once they are dissolved into the water in the soil.
- **Time release, or slow-release, fertilizer**
These fertilizers are made to slowly release nutrients to plants over 3 to 6 months. Some slow-release fertilizers even last up to twelve months! These slow-release forms are mixed into the soil before planting and are used mostly for container plants.

2. Organic fertilizers, such as manure, fish emulsion, and seaweed, are made from plant and animal wastes. They are safe to use and do not 'burn' plants easily, but in most cases it takes more organic fertilizer to provide the nutrients that the plants

need. Organic fertilizers not only provide nutrients to the soil but they also help the soil hold water and they keep soil from becoming hard.

How much fertilizer do I give my plants?

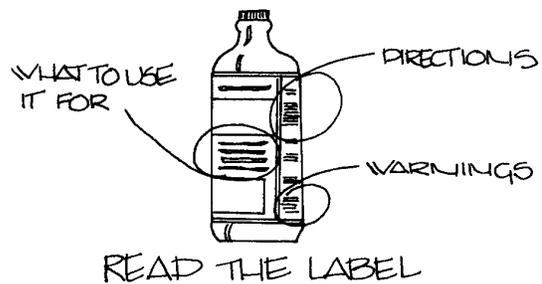
To find out how much fertilizer you need to put on your outdoor garden you must first test your soil. Soil-testing is best done in the fall of the year. You can get a soil test kit from your Extension Office. Follow the directions on how to take the test. The soil-testing lab will send you the results. You will then know how much fertilizer your soil needs, when to put it on your garden, and how to put it on your garden.

Container plants are fertilized more often than gardens because they have very little soil. Follow the directions on the fertilizer label to find out how much and how often you must fertilize your container plants. Use fertilizer made for container plants.

How do I fertilize my plants?

The fertilizer label tells you everything you need to know about using the fertilizer. It will tell you:

- what plants to use it on
- how much fertilizer to use
- how often it can be used
- how to put it on the garden or container plant



It is very important that you READ the fertilizer package label before you put any fertilizer on your garden!

Some fertilizing hints:

- To add fertilizer after plants are growing, many people like to use fertilizers that can be mixed with water and poured onto the plants. These fertilizers can be so different that a teaspoon of one kind of fertilizer in a gallon of water may kill a plant...while the same amount of another one in a gallon of water may not be enough!

Remember to read the package label!

- Have the garden or container soil moist **before** adding fertilizer.
- For vegetables, be sure to get a fertilizer that lists vegetables on its label. Other special plant foods may not be good for vegetables. They may be too strong, the wrong mixture of nutrients, or they may

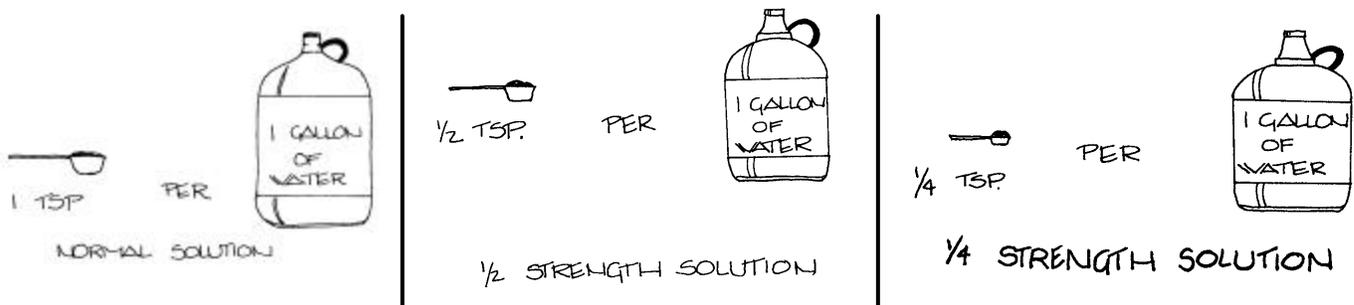


contain poisons that could not only hurt the plant, but you and your family as well. Follow the instructions for container plants if you are growing your vegetables in containers.

How do I mix fertilizers?

Concentrated liquid and powder fertilizers need to be mixed with water to dilute them before putting them on the plant. The fertilizer label will tell you how much fertilizer to mix with water for normal use. When the directions say to use a 1/2 or 1/4 strength solution, it means you use 1/2 or 1/4 the amount of fertilizer in the same amount of water.

For example (with illustration): if the directions say use 1 teaspoon in a gallon of water for normal strength, then you can make a fertilizer with 1/2 strength.... or a fertilizer with 1/4 strength as shown below.



A 1/4 strength solution is used for seedlings and for transplanting. This is called a **starter solution**.

New Words

- broadcast: to scatter seed or fertilizer on the surface of the soil
- dilute: to mix with water to make less strong
- macronutrients: nutrients needed by plants in large amounts
- micronutrients: nutrients needed by plants in small amounts
- side-dressed: to place fertilizer on the ground along the side of the plant
- synthetic: man-made materials
- time release fertilizer
(or slow release): fertilizer, usually in granules, made so that small quantities of fertilizer are released over a long period of time