



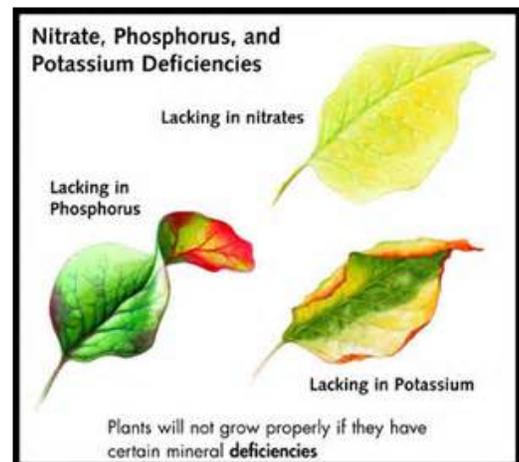
What's in Your Bag of Fertilizer?

by Sharon Plein, UC Master Gardener

If you walk into any nursery outlet or hardware store and visit the fertilizer aisle, you may be bewildered by the number of commercial products available for the home gardener. There are product formulations for specific types of plants and they come in many sizes, weights and nutrient compositions. There are organic (derived from living materials, such as compost, manure or bone meal) and inorganic (synthetic) fertilizers in liquid and granular formulas. Inorganic granular products are popular because many are easier to handle and spread than organic fertilizers, like manure. They also don't require mix and spray application like liquid types. Selecting a fertilizer can be very confusing and leave you with many questions. What does a bag of fertilizer need to promote healthy plant growth, and what do those numbers on the containers mean?

The answer to those questions can be found in the set of numbers on the bottoms or backs of fertilizer packages. The three numbers indicate the amounts of three essential mineral elements (macronutrients) for plant growth: nitrogen (N), phosphorus (P) in the form of phosphate, and potassium (K) in the form of potash. Phosphate and potash are not 100% pure forms of the elements, but that does not really matter for the home gardener. Fertilizer companies combine the 3 elements in a ratio that is conducive to plant growth.

N, P, and K are listed as percentages of the container's weight. For example, if you purchase a twenty pound bag of 15-15-15, you are buying 3 pounds each of Nitrogen, Phosphate, and Potash (20 lbs. x .15 = 3). This formula will help you determine the price and value of your fertilizer purchase. Not all packaged fertilizers contain N, P, and K. There may be zeroes in the list of mineral elements nutrients. Mixed or balanced fertilizers will contain all three numbers and provide the nutrients necessary for plant growth and production of flowers, vegetables, and fruits in your home garden. Some fertilizers may also contain other micro elements, like iron (Fe), sulfur (S), and zinc (Zn) to correct soil deficiencies.



Missing nutrients

Nitrogen is the first listed element in a balanced fertilizer "recipe." In nature, N may not be readily available in soil because it comes into the soil after animal or dead plant materials decompose and undergo chemical changes. Adding nitrogen to the soil is essential because growing plants deplete nitrogen and irrigation leaches it from the root zone. Nitrogen affects the growth, size and color of the plants. It causes plants to develop their desirable green color and promotes a fast greening response that is especially apparent in lawns. Do not subscribe to the "more is better philosophy." Too much N can easily burn plants. Too little N available to plants first shows up as an overall paler green in plants, then may cause older leaves to turn yellow and drop off, while the growing tips appear healthy. Plants benefit from periodic addition of nitrogen during the growing season.

Phosphorus (P), the second essential element in the fertilizer “recipe,” helps plants establish strong root systems, and produce fruits, flowers and seeds. Phosphorus promotes beautiful blooms in flowers and bulbs. I think of phosphorus as a “petal pusher.” Symptoms of phosphorus deficiency are leaf tips that look burnt, and older leaves that appear very dark green or reddish purple.

Potassium (K) is the third element listed in a balanced fertilizer mix. It contributes to the overall vigor of plants. It also promotes nitrogen utilization and seed production. K causes the nitrogen and phosphorus in your fertilizer to work better. Symptoms of K deficiency are older leaves that wilt or look scorched. Leaves may yellow or become pale between the veins. Scorching or burning appears to begin at the edges or margins of the leaf. California soils are rich in potassium, so it is rarely an element that is limiting plant growth.

Our dry western soils have high pH levels and may require the addition of other mineral nutrients (micronutrients) such as iron, sulfur and zinc to promote plant growth. Symptoms of deficiencies of all three of these elements include yellowing of leaves. Leaves deficient in iron show yellow leaves with green veins. Sulfur deficiency causes younger leaves to turn yellow first, but older leaves may yellow as well. Zinc deficiency is indicated by very small leaves especially at the terminal end. Since it is difficult for a novice to diagnose deficiencies of iron, sulfur, and zinc, consult an expert or Master Gardener for advice.

Fertilizers alone are not the answer to a gardener’s prayer. Plants also need adequate water and organic materials such as composts or manures to enrich the soil, improve its texture and promote water penetration. Be sure to read and follow application instructions on the fertilizer container. If you have additional questions about how much and when to fertilize your plants, visit the UC Master Gardeners website at:

http://ucanr.edu/sites/UC_Master_Gardeners/.

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