

SOIL MANAGEMENT

Macronutrients and Micronutrients

Fertile garden soil is essential to obtain the best growth and productivity from vegetables and flowers. Plants need different amounts of seventeen essential elements to grow. Soils are rarely fertile enough to supply adequate quantities of all the elements needed for best plant growth. Most soils do not contain enough Nitrogen for optimum plant growth. Vegetables and other shallow rooted plants also usually grow better with additional Phosphorus and sometimes Potassium. These three elements, and any other elements that a soil may lack, can be supplied with an appropriate fertilizer and compost. Fertilizers may be either organic or inorganic (often called chemical) materials. Compost and similar organic amendments are a source of plant nutrients, but usually do not provide enough Nitrogen for optimum plant growth.

Plants require seventeen essential elements for growth. If any one of these elements is missing, a plant will not grow, even if all the other elements are present in their required amounts. The elements which plants require in relatively large amounts are called macronutrients. The primary macronutrients are Nitrogen (N), Phosphorus (P), and Potassium (K). Nitrogen promotes green leaves and foliage growth. Phosphorous stimulates healthy root growth and helps with the formation of flowers, seeds, and fruit. Potassium is required for proper development of flowers and fruit, ensuring good size, color, and quantity. Commercial fertilizers show the percentage of these three nutrients on the label. A 16 – 20 – 0 fertilizer contains: 16% Nitrogen, 20% Phosphorus, and no Potassium.

The secondary macronutrients are Calcium (Ca), Magnesium (Mg), and Sulfur(S). [Click here to go to the detailed Macronutrient table for information on symptoms of deficiency and symptoms of excess.](#)

Essential elements which plants need in relatively small amounts are called Micronutrients. The Micronutrients are Boron, Chlorine, Copper, Iron, Manganese, Molybdenum, Zinc, and Nickel. Composting organic matter such as grass clippings and tree leaves is an excellent way to provide micronutrients. [Click here to go to the detailed table for information on symptoms of deficiency and symptoms of excess.](#)