



# Over the Garden Fence

Test your Soil



*By Bob Labozetta (UC Master Gardener, Mariposa)*

Plant nutrients are the chemical elements and compounds necessary for plant growth and reproduction. Healthy soil contains 17 elements plants need, divided into mineral and non-mineral elements. Mineral nutrients enter plants primarily through the soil. Non-mineral nutrients may enter either through the soil or atmosphere. The 17 plant nutrients are categorized as-

**Macronutrients** -- Nitrogen (N), Phosphorus (P), Potassium (K). Usually listed on bags of fertilizers, these are plant-essential elements required in relatively large amounts by plants.

**Secondary nutrients** -- Magnesium (Mg), Sulfur (S), Calcium (Ca). These are plant-essential elements required by plants in very small amounts.

**Micronutrients** -- Boron (B), Chlorine (Cl), Manganese (Mn), Iron (Fe), Nickel (Ni), Copper (Cu), Zinc (Zn), Molybdenum (Mo). These are also plant-essential elements required by plants in very small amounts.

**Non-fertilizer elements** -- Hydrogen (H), Carbon (C), Oxygen (O). These non-mineral nutrients are in the compounds required for photosynthesis. Water, supplied via irrigation or rainfall provides the hydrogen required to convert solar energy (light) into chemical energy (sugars.)

Although plants need much higher amounts of macronutrients than micronutrients, all 17 essential elements must be present for a plant to be healthy. A common problem in California is related to a plant's need for nitrogen, phosphorus, potassium, zinc and iron, as well as symptoms caused by excesses in boron, chloride and sodium.

Before a nutrient can be used by plants it must be dissolved in a soil and water solution. Nutrients are carried up through the plant with water absorbed through the roots. Most minerals and nutrients are more available in acid soils than in neutral or slightly alkaline soils.

Know the pH level in your garden's soil. The pH level measures the acidity and alkalinity of soil. The scale ranges from 4.0 to 9.0. pH Level affects the availability of nutrients to support plants. Nutrients can be absorbed in a pH level from 5.5 to 7.5. Many plants do well at a pH range of about 6 to 7.

To learn whether you need to add nutrients, have your garden soil tested. You can begin by using a soil testing kit sold at most garden centers and nurseries. Note: Ideally, distilled water should be used when administering a soil test. Here is a helpful guide for [Using Soil Test Kits](#).

A more accurate determination of your garden soil's needs is available by laboratory analysis. Please visit our [website](#) for a list of Soil Test Labs in the Central Valley.

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*UC Master Gardeners of Mariposa County serve Mariposa County, including Coulterville, Greeley Hill and Don Pedro. For gardening and event information, call us at 209-966-7078 or email [mgmariposa@ucdavis.edu](mailto:mgmariposa@ucdavis.edu). Find us online at [http://cemarioposa.ucanr.edu/Master\\_Gardener/](http://cemarioposa.ucanr.edu/Master_Gardener/), on Facebook (UC Master Gardeners of Mariposa County), and on YouTube at "UCCE Mariposa". Listen to us on KRYZ 98.5 FM radio Wednesdays at 2pm and Saturdays at 5pm.*