

Essential Plant Nutrients

All plants need access to essential nutrients generally found in garden soils. Simple soil tests are an inexpensive way to protect your plants. Collect 5–10 scoops of soil from around your garden site (use a trowel and go down up to 6" in the soil) into a bag or container. Break up clumps, remove plant material like grass and roots, and mix well to get a general sample from your garden. Follow directions on your test kit or submit to your local Cooperative Extension or Land Grant University. Results will tell you what supplements may be needed before the next season's planting.

Nutrient	Symptom of Insufficient Nutrient Availability
Nitrogen	Stunted growth, small pale yellow leaves. Plant may be light green. Older leaves affected first (generally near the bottom of the plant and closer to main stem).
Phosphorus	Red or purplish color on leaves, especially on undersides. Often a problem in cool soils in early spring.
Potassium	Bronzing and die-off of leaf margin (the edges). Some spotting between veins. Chlorotic with brown spots throughout leaf.
Calcium	Newest leaves curled/hooked. Dieback of the terminal bud (the top or newest bud on a stem). New leaves are yellow and older leaves are dark green.
Magnesium	Mottled yellowing between leaf veins in older leaves while veins remain green. Yellow areas may turn brown and die.
Sulfur	Plant as a whole is affected—plant appears a light green.
Iron	Yellow or white areas on youngest leaves. Veins typically green.
Boron	Youngest leaves become light green and may become distorted. Terminal bud (top, newest bud on a stem) may eventually die.
Molybdenum	Narrowed leaves. Yellowing interveinal (in between veins) on older leaves. New leaves start green and become mottled as they expand.
Manganese	Yellow to white colored leaves but veins remain green.
Zinc	Spotting on older leaves, usually between veins. Reddish-brown spots on cotyledons (newly sprouting plants), especially on bean plants.
Copper	Young leaves permanently wilted without any change in color.