

Table 2. Generalized Symptoms of Plant Nutrient Deficiency or Excess

Plant Nutrient	Type	Visual symptoms
Nitrogen	Deficiency	Light green to yellow appearance of leaves, especially older leaves; stunted growth; poor fruit development.
	Excess	Dark green foliage which may be susceptible to lodging, drought, disease and insect invasion. Fruit and seed crops may fail to yield.
Phosphorus	Deficiency	Leaves may develop purple coloration; stunted plant growth and delay in plant development.
	Excess	Excess phosphorus may cause micronutrient deficiencies, especially iron or zinc.
Potassium	Deficiency	Older leaves turn yellow initially around margins and die; irregular fruit development.
	Excess	Excess potassium may cause deficiencies in magnesium and possibly calcium.
Calcium	Deficiency	Reduced growth or death of growing tips; blossom-end rot of tomato; poor fruit development and appearance.
	Excess	Excess calcium may cause deficiency in either magnesium or potassium
Magnesium	Deficiency	Initial yellowing of older leaves between leaf veins spreading to younger leaves; poor fruit development and production.
	Excess	High concentration tolerated in plant; however, imbalance with calcium and potassium may reduce growth.
Sulfur	Deficiency	Initial yellowing of young leaves spreading to whole plant; similar symptoms to nitrogen deficiency but occurs on new growth.
	Excess	Excess of sulfur may cause premature dropping of leaves.
Iron	Deficiency	Initial distinct yellow or white areas between veins of young leaves leading to spots of dead leaf tissue.
	Excess	Possible bronzing of leaves with tiny brown spots.
Manganese	Deficiency	Interveinal yellowing or mottling of young leaves.
	Excess	Older leaves have brown spots surrounded by a chlorotic circle or zone.
Zinc	Deficiency	Interveinal yellowing on young leaves; reduced leaf size.
	Excess	Excess zinc may cause iron deficiency in some plants.
Boron	Deficiency	Death of growing points and deformation of leaves with areas of discoloration.
	Excess	Leaf tips become yellow followed by necrosis. Leaves get a scorched appearance and later fall off.