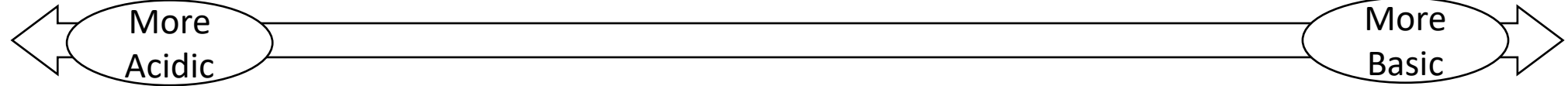


**Potential Nutrient Deficiencies
Grouped By Soil pH**



pH < 5.5

pH < 6

pH > 7.5

pH > 8

Potassium

Phosphorous

Iron

Zinc

Calcium

Manganese

Copper

Magnesium

Boron

Molybdenum

**Availability
of all
nutrients is
generally
maximized
between a
pH of 6.5
and 7.5**

**Deficiencies that occur without regard to
soil pH: Nitrogen, Sulfur**

**Nutrient Deficiencies Grouped
by Most Likely Position of
Symptoms**

**Lowest third of
the plant**

Calcium

Magnesium

Phosphorous

Nitrogen

Copper

**Center third of
the plant**

Potassium

**All over the
entire plant**

Sulfur

**Upper third of
the plant**

Iron

Manganese

Boron

Zinc

What else will look like a nitrogen deficiency? Boron, nickel, and molybdenum deficiencies might look like all over yellowing that is worst at the base of the plant, because those three micronutrients are critical for healthy nodule formation.

Macronutrient and Secondary Nutrient Deficiency Symptoms

Calcium: poor root development, stunting, hollow hearts, poor nodule formation

Magnesium: mottled yellowing on leaves, with some necrotic spots especially on lower leaves

Nitrogen: overall yellowing, with more pronounced yellowing, bronzing, or even necrosis at the base of the plant

Phosphorus: stunting, few branches, poor root development, darker than normal leaves, red veins especially in the lower canopy

Potassium: yellow leaf margins, especially on leaves in the center of the canopy

Sulfur: all-over yellowing that affects leaf tissue and veins equally

Micronutrient Deficiency Symptoms

Boron: swollen leaves and nodes at the top of the plant, poor nodulation; in severe cases, can result in stem splitting and hollow hearts later in the season

Copper: whitish-grey lesions on more mature leaves, crinkly leaves

Iron: interveinal chlorosis and bronzing or necrosis, especially on newer leaves

Manganese: interveinal chlorosis, especially on newer leaves

Molybdenum: yellowing and poor nodule formation

Nickel: yellowing and poor nodule formation, sometimes developing into necrotic leaf tips on younger leaves

Zinc: irregular, mottled yellowing that is lighter in color than other deficiencies (almost white in color), especially on newer leaves