PLANT NUTRITION - DICHOTOMOUS KEY FOR MINERAL DEFICIENCY SYMPTOMS

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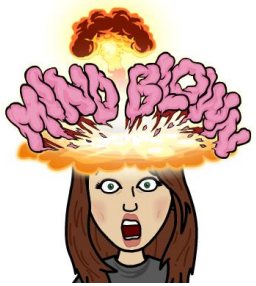

START BY LOOKING A THE PLANT

General chlorosis and/or drying of lower leaves, retarded growth

Chlorosis progresses from light green to yellow, from older leaves up to new growth. Growth is restricted, spindly, loss of older leaves.

NITROGEN

Leaves remain dark green, growth restricted, and distinctive purple coloration of undersides of leaves. Lower leaves dry. Root growth is restricted. Fruit-set delayed.

PHOSPHOROUS

Older or lower leaves affected

Localized mottling or chlorosis with or without dead spots, no drying of lower leaves

Interveinal chlorosis, mottled effect with green veins. Margins curl upward, necrotic spots, stalks slender.

MAGNESIUM

Mottled or chlorotic leaves with spots of dead tissue

Small dead spots at tips and between veins. Margins cup downward with brown spots. Growth is restricted, slender stalks. Roots poorly developed.

POTASSIU

Spots generalized, rapidly enlarging to include veins, leaves thick, stalks with shortened internodes. Young leaves small, interveinal chlorosis, mottled, curl downward.

ZINC

Mottling of older leaves with veins remaining light green. Leaf margins become necrotic, may curl upward, necrotic spots of leaf tips and margins. Symptoms spread to younger leaves as deficiency progresses.

MOLYBDENUM

Young leaves, terminal growth leaves affected

Growing tip distorted, young leaves at tips chlorotic, with necrotic spots expanding to browning of leaf margins and dieback.

Brittle tissue not present in growing tips, young leaves chlorotic, old leaves remain green, stems thick and woody, growing tip necrotic followed by dieback, blossom-end rot of fruit (especially tomatoes)

CALCIUM

Growing tip—leaves and petioles—light green to yellow, brittle tissue, often deformed or curled. Rosetting of terminal growth because of shortening of internodes. Terminal bud dies, new growth may form at lower leaf axils, but these suckers (especially tomatoes) show similar symptoms of chlorosis necrosis, browning, and brittleness. Internal browning, open locules, blotchy ripening to tomato fruit

BORON

Growing tip alive, not distorted, wilting or chlorosis with or without dead spots, veins light or dark green.

Young leaves wilt, chlorosis, necrosis, retarded growth, lodging of growing tip.

COPPER

Young leaves not wiled, chlorosis with or without necrosis and dead spots

Interveinal dead sports not present, chlorosis of tissue may or may not involve veins.

Leaves uniformly light green becoming yellow, veins not green, poor spindly growth, hard and wood stems.

SULFUR

Tissue between veins yellows, veins green, eventually veins become chlorotic. Yellow interveinal tissue becomes white, but no necrosis. Stems slender, short. Flowers abort and fall off, tomato flower clusters are small, thin stemmed.

IRON

Interveinal chlorosis, veins remain green to give checkered pattern. Chlorotic areas become brown to late form necrotic spots of dead tissue

MANGANESE