Common Nutritional Disorders of Vegetable Crops in Alabama

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NITROGEN DEFICIENCY

**Deficiency:** Uniform chlorosis of older leaves; necrosis can develop after a long period; youngest leaves appear green & healthy; older leaves turn necrotic.

Potential Causes:

- Leaching from excessive rainfall or irrigation
- Most of the N applied could be in the NO$_3^-$ form, which readily leaches compared to NH$_4^+$. Can be antagonized by K, i.e., high soil K will reduce foliar N.
NITROGEN DEFICIENCY

SOIL TEST & FOLIAR ANALYSIS TO CONFIRM

ADD N CONTAINING FERTILIZER
**Deficiency**: General chlorosis of lower leaves; plants appear stunted; plants develops a very dark green appearance; some plant species show a purpling/reddening of lower or stems leaves (tomatoes, corn); fruit and seed development depressed. Once apparent, likely too late to correct.

**Potential Causes**…

- High soil pH decreases P uptake (P precipitates with Ca)
- Low soil temperatures
Phosphorus Deficiency

- Soil test & Foliar analysis to confirm
- Add N containing fertilizer
- Check soil pH
**Deficiency:** Increased disease susceptibility; develop chlorotic areas on leaves (often marginal); these areas rapidly turn necrotic; necrosis decreases as you move towards younger leaves; poor fruit quality.

**Potential Causes...**

- K can leach in humid, sandy soils

- K uptake is antagonized by other cations -- high levels of soil NH$_4^+$, Na$^+$, Ca$^{2+}$, Mg$^{2+}$
POTASSIUM DEFICIENCY

SOIL TEST & FOLIAR ANALYSIS TO CONFIRM

ADD K CONTAINING FERTILIZER
FOLIAR FEEDING OF VEGETABLES usually NOT needed and will not CORRECT a PRIMARY MACRONUTRIENT deficiency

- DO NOT FOLIAR APPLY N, P, OR K – CANNOT MEET PLANTS NEEDS W/ FOLIAR FEEDING

- NOT TO BE CONFUSED WITH TRANSPLANT OR STARTER FERTILIZER

- POSSIBLE TO SUPPLY SECONDARY AND MICROS VIA FOLIAR FEEDING, BUT BETTER TO HAVE IN SOIL
  - KEY IS TO SOIL TEST, KNOW PARTICULARS OF EACH VEGETABLE CROP
**Calcium Deficiency**

*Deficiency:* Irregular chlorosis of foliage at top of plant; incomplete formation of leaves, flowers and roots; leaf marginal necrosis; blossom-end rot; black heart in celery.

**Potential Causes:**

- Improper soil pH (usually too low)
- Failure to lime with a Ca containing material
- Fluctuations in soil moisture; drought stress; flooding
CALCIUM DEFICIENCY

SOIL TEST & FOLIAR ANALYSIS
TO CONFIRM

LIME W/ DOLOMITIC
LIMESTONE/USE Ca FERTILIZER

CONTROL SOIL MOISTURE
CALCium DEFICIENCY

APPLY Ca nitrate OR Ca chloride???

NEVER USE Ca chloride above 85°F

USE ~4 lb of either per 100 gal of water
Magnesium Deficiency

Deficiency: Interveinal chlorosis of older leaves; necrosis develops over time; can get a red-pink interveinal pigmentation in some plant species.

Potential Causes…

Improper soil pH

Failure to lime with a Mg containing material
Magnesium Deficiency

Soil test & foliar analysis to confirm

Lime with dolomitic lime and/or use Mg fertilizer
**Magnesium Deficiency**

- Prevent or alleviate some symptoms, use Epsom salts injected or foliar.
- At 1 to 2 lb. Mg per acre (depending on crop, 2 to 3 applications or weekly)
For micros, unlikely that you will see widespread problems.

More common to see pockets of plants with deficiency problems.

With the exception of Mo, micros become very insoluble at high pH.

Foliar application of materials can alleviate the deficiency.
**Boron Deficiency**

*Deficiency*: Youngest leaves appear thick w/a coppery texture. Leaves curl & crack; growing points – vegetative and floral buds abort, reform, & then abort again. Plant appears it had been pinched back. Corking occurs on the leaves. Internodes shortened.

**Potential Causes…**

- Improper soil pH – pH to high
- W/ exception of Mo, micros become insoluble @ high pH
**Boron Deficiency**

**B-deficiency most widely reported micro problem in vegetables**

- **Especially in asparagus, most bulb & root crops, Cole crops & Tomatoes**
  - Apply 1–2 lb. B/A under Medium B level
  - Apply 2–3 lb. B/A under Low B levels
  - Use Borax (11.36%), Solubor (20.5%) or other fertilizer grade borate

- **Some crops, B applied preventatively:**
  - Apply 2–3 lb/A on Asparagus every 3rd year
  - Apply 2–3 lb B/A broadcast on broccoli & other Cole crops
Toxicity: B can become toxic. Some plant species are sensitive to higher levels of B in the soil especially following a crop that received a supplemental B application, e.g., beans following a Cole crop.