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Huanglongbing (HLB; Citrus Greening) and Nutrient Deficiency Identification

PP328

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HLB FACTS

- HLB is a bacterial disease spread by an insect, the Asian citrus psyllid.
- The bacteria causes damage to the phloem (subsequently disrupts the internal movement of sugars).
- Leaf symptoms include blotchy mottle, yellow veins, or vein corking.
- Fruit symptoms include lopsided, small, and/or misshapen fruit. Fruit also can have a color inversion compared with healthy fruit.
- Once a tree is infected, currently there is **no** cure.
- HLB cannot be cured with fertilizer; however, a good nutrition program can improve productivity of HLB–affected trees.

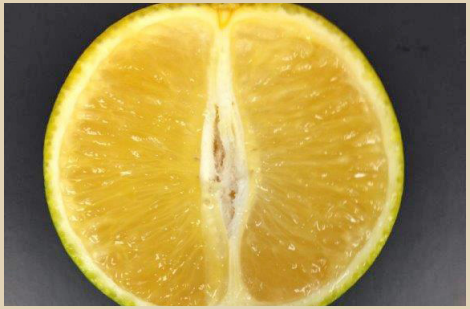
CITRUS NUTRITION

- Citrus nutrition is essential to maintaining healthy and productive trees.
- Trees become symptomatic when lacking a needed nutrient.
- Each nutrient deficiency produces unique symptoms; therefore, visual symptoms can be used to diagnose and create a management plan.
- Common symptoms of nutrient deficiencies are chlorosis and interveinal patterns.
- Unless severe, fruit do not show symptoms of nutrient deficiencies, except with copper deficiency.
- Nutrient deficiencies can be reversed with proper fertilization practices.

IDENTIFICATION OF HLB SYMPTOMS AND NUTRIENT DEFICIENCIES

- Nutrient deficiency symptoms can often be confused for HLB symptoms, and vice versa, although careful identification can easily set them apart.
- The most common HLB leaf symptom is the blotchy mottle pattern. The blotchy mottle pattern is an **asymmetrical** pattern across the midvein.
- Nutrient deficiencies will have various patterns for each deficiency, but the patterns will always be **symmetrical** across the midvein (see other side).
- Both HLB and nutrient symptoms can be seen on the upper and lower side of the leaf.

Young (new) flush is light green and will become dark green as it matures



Healthy cut fruit

Leaves with HLB symptoms

HLB symptomatic fruit

Healthy mature leaves are dark green

Healthy whole fruit

Nutrient deficient leaf

HLB symptomatic fruit & vein corking on leaves

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Nitrogen

Nitrogen

Iron

Manganese

PEN TEST

The pen test is a visual diagnosis tool. This simple test helps to determine if the leaf is HLB-affected or nutrient deficient by determining if the symptoms across the mid-vein are symmetrical or asymmetrical.

TOOLS

Leaf in question

Writing utensil (permanent marker or pen)

INSTRUCTIONS

Draw a circle on each side of the midvein (vein in center of leaf).

Circles should be side by side.

DIAGNOSIS

Determine if the areas within the circles are the same or if they are different.

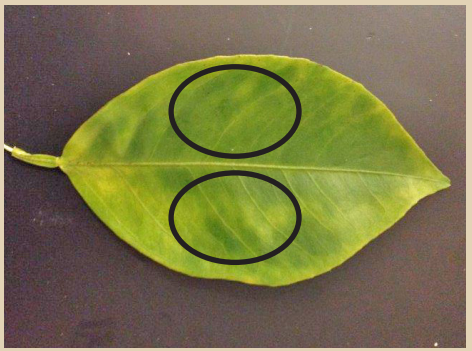
The HLB blotchy mottle pattern will not match.

A nutrient deficiency will be the same in both circles.

IF A VISUAL DIAGNOSIS CANNOT BE MADE, SAMPLES CAN BE SENT TO A LAB FOR DISEASE DIAGNOSTICS. VISIT HTTP://FPDN.IFAS.UFL.EDU FOR DIAGNOSTIC LAB SITE INFORMATION.

Zinc

Magnesium



Pen test on HLB-affected leaf

Pen test on nutrient deficient leaf

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