
Diseases of Local Importance

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**1st identified
in Guam in
December 2014**

**HLB believed
to be widespread
in Guam.**

**Citrus Greening =
Huanglongbing (HLB)**

**Insect Vector (Asian citrus psyllid)
is widespread on all Mariana Islands.**

HOW TO RECOGNIZE CITRUS GREENING

common symptoms



- Bright yellow shoots
- Leaf drop
- Canopy thinning

HOW TO RECOGNIZE CITRUS GREENING

common symptoms

- Leaf veins: yellow or corky
- Asymmetric leaf mottling



HOW TO RECOGNIZE CITRUS GREENING

common symptoms



- Lop-sided fruits w/
curved columella
- Color inversion

HOW TO RECOGNIZE CITRUS GREENING

common symptoms



Asian Citrus Psyllid infestation



COMMONLY CONFUSED WITH: Citrus Gummosis

- Disease caused by fungus-like, *Phytophthora* spp.
- Leaf and tree symptoms similar to Citrus Greening

The DIFFERENCE???

Sap oozing from trunk or stem.

Psyllid may or may not be present.



COMMONLY CONFUSED WITH: **Nutritional Deficiency**

Nitrogen deficiency:

- light yellow/green leaves
- appear 1st on mature leaves, then young.



Iron deficiency:

- appear 1st on young leaves, then older leaves
- leaves pale yellow **with green veins.**



**THE BEST
DEFENSE IS A GOOD
OFFENSE.**

1. Provide adequate nutrition.
2. Practice good field sanitation.
3. Monitor for ACP insect vectors regularly.
4. Follow label recommendations for insecticides.
5. Rogue diseased plants.

**HLB infection can be hidden
for more than a year.**

Banana bunchy top disease



The major disease for banana in the Marianas.

Plants can be infected for 4+ months before symptoms appear.

Once infected, virus spreads to all parts of the banana mat.

HOW TO RECOGNIZE

Bunchy top disease

common symptoms

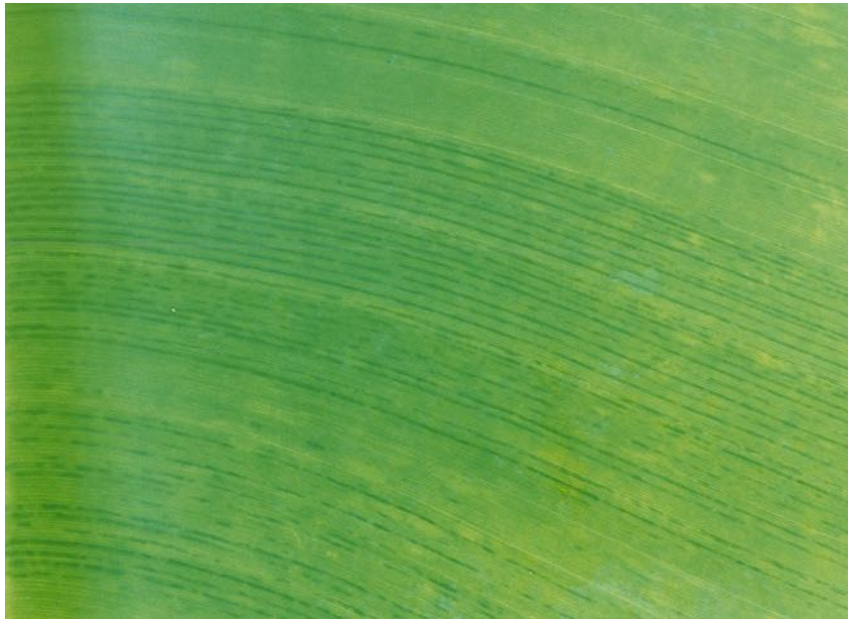
- leaves narrow, short and bunched at collar of pseudostem
- yellow edges or streaking on leaf margins



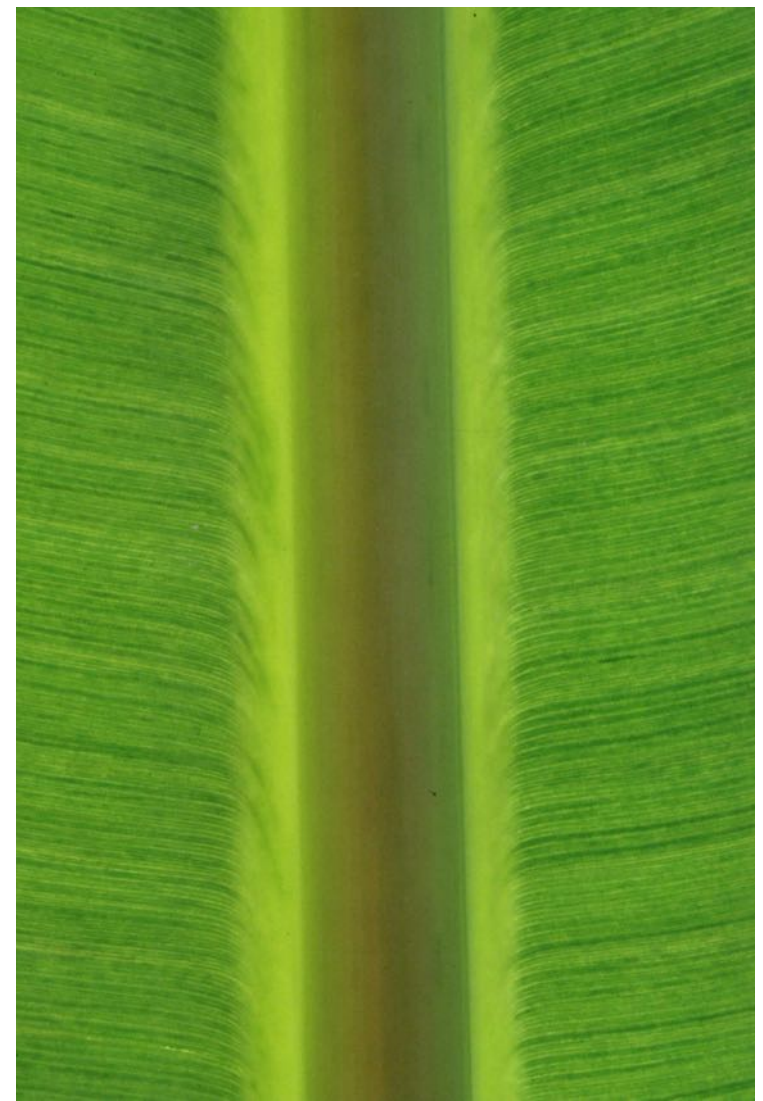
HOW TO RECOGNIZE

Bunchy top disease

common symptoms



**Morse code, dots-
and-dashes**



“J-hooks” at midrib

HOW TO RECOGNIZE

Bunchy top disease

common symptoms



**Banana aphid
presence**



**Streaks may appear
on inflorescence,
if present.**

4 Steps to control Bunchy Top Disease

1. Remove sources of virus and banana aphid.

Remove alternative hosts (taro, ginger and heliconia) from the area.

2. Control for aphids.

Follow label instructions for any insecticide. Apply to whorl and upper part of trunk.

3. Destroy infected plants.

Gouge a hole into the pseudostem, then spray or pour herbicide to kill the entire banana mat (6-8 weeks).

4. Remove diseased mats.

Dig out and remove dead trees and underground corms to prevent re-sprouting.

Tinangaja Disease of Coconut



Disease known
ONLY ON GUAM.

Slow-acting, lethal
disease of coconut
caused by a viroid.

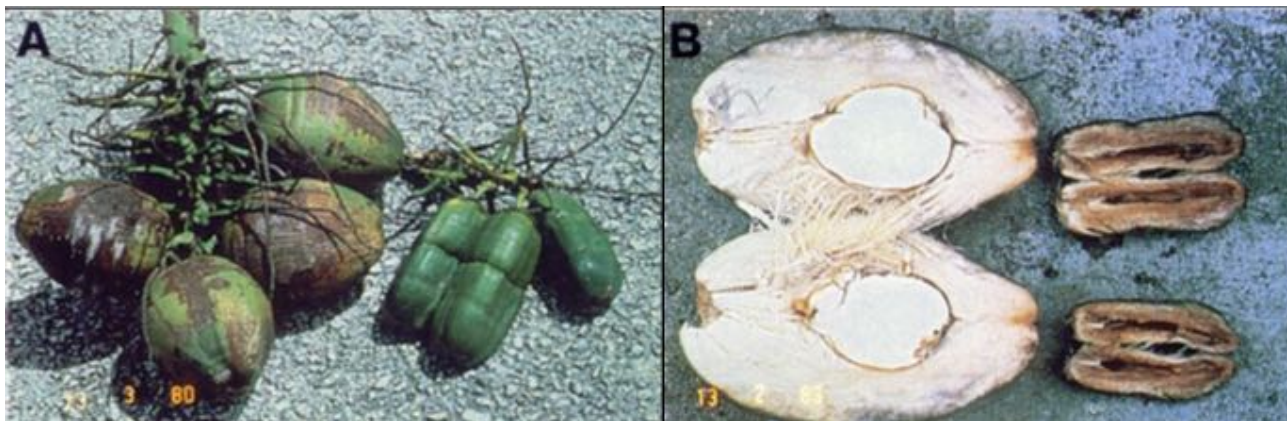
Possibly vectored by CRB.

Tinangaja - Symptoms



Several years between initial infection and appearance of symptoms.

- Reduced & thinning crown
- Nuts - quantity and size reduced until...deformed nuts with no kernel
- Thinning, tapering trunk



Suspected vectors of Tinangaja

- contaminated cutting tools
 - harvesting leaves, nuts, tuba
- pollen- and seed-transmission
 - 1% transmission confirmed with Cadang-cadang
- Coleopteran (includes CRB) insect vectors
 - suspected since 1970s but never confirmed

1917: 1st description
of Tinangaja

1997: Tinangaja estimated to
infect 30% of all coconut palms

Tinangaja Disease of Coconut

2007: CRB detected
in Tumon

2016: 50% of coconut palms
in Tumon with CRB damage

CRB damage to coconut palms





UOG Dean's Circle, House 30

Managing Tinangaja

Prevent mechanical transmission with cutting tools.

Remove flower spike to prevent pollen- and seed-transmission.

How to prevent/limit insect vectors?

Thank you.