Diagnosing Declining Palms

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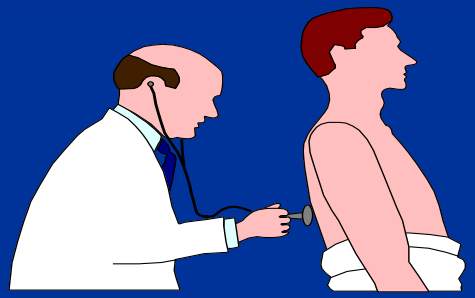
Diagnosing *Declining* Palms

Once the palm is dead, it is often extremely difficult to make a diagnosis (unless there is adequate pre-death documentation)

PLANTS DON'T TALK!



Information about a plant sample must be based on visual observations and from person(s) managing the plant.

Ask the right questions!

Be a Detective!

- In many cases, diagnosis is a process of eliminating potential causes for the symptoms observed
- You may not be able to make a diagnosis until the palm is removed
- Palm autopsies are good learning tools!

Be a Detective!

SureLook Holmes

- **Keep an open mind – anything is possible**
- **Is there a pattern to the problem?**
- **Ask <u>lots</u> of questions**

1. **fertility**
2. **trimming (removing the evidence!!)**
3. **weather patterns**
4. **pesticide usage**
5. **planting date, water table, and so on**

Diagnostic Tools

- Binoculars!!!!!!
- Saws – pole, hand, chain
- Hand pruners
- Box cutter with extra blades
- Paper bags for most disease samples
- Phytoplasma sampling kit
- Digital camera

Two new "keys" for diagnosing palm problems:

1) **Palm Problem Key** on the FLREC website http://flrec.ifas.ufl.edu

2) **Symptoms of Palm Diseases and Disorders** on the Lucid website www.lucidcentral.org

Palm Problems:
A Key to Common Landscape Palm Disorders and Diseases

- **http://flrec.ifas.ufl.edu**
- **upper right side of home page**
  "Palm Problems Website"
- **includes links to EDIS pubs**
- **includes some insect damage**

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SOLUTIONS for your LIFE

- Academic Programs
- Aquatic Plant Management
- Entomology & Nematology
- Environmental Horticulture
- Geomatics
- Plant Pathology
- Palm Production and Maintenance
  - Palm Problems
  - Palm Diseases,
  - Pests of Palms in Florida
  - Palm Nutrition Guide,
  - Container Production of Palms
  - Palm Photo Gallery

A Key to Common Landscape Palm Disorders and Diseases in the Continental United States

To use this key effectively, you must :

- **a)** know how the palm species looks normally (when it is healthy)
- **b)** closely examine the *entire* palm from the top of the canopy to the soil line
- **c)** note the portion of the palm that does not look "normal."

The key is divided into five major headings based

Click the above image to enter the Key to Common Landscape Palm Disorders and Diseases in the Continental United States

Palm Problems
(on FLREC website)

To use this key effectively, you must :

a) know how the palm species looks normally (when it is healthy)

b) examine the entire palm from the top of the canopy to the soil line

c) note the portion of the palm that does not look “normal”

The key is divided into five major headings based on location of observed symptoms:

1) entire canopy (most or all leaves)
2) oldest leaves only
3) youngest leaves only
4) flowers and fruits
5) trunk

A Resource for Pests and Diseases of Cultivated Palms

- developed with USDA-APHIS-CPHST
- will contain six tools (keys) with fact sheets
- 2 tools completed (www.lucidcentral.org):
  1) Screening Aid to Pests (insects)
  2) Symptoms of Diseases and Disorders (with insect damage also included)

Know What Is Normal

You can't diagnose a plant problem without knowing how the plant looks when it is healthy, or what is normal!

“Scales” on under-side of pygmy date palm; more prevalent on newer leaves

“Scurf” is fuzzy palm leaf material that may or may not rub off

Spines indent petiole and rub-off the epidermis when still young

Multi-stem palm: first leaf of new side shoot is usually crumpled

What does the inside of a healthy palm trunk look like?

Disease or chain saw oil? One cross-section is often not adequate.

Steps for Obtaining an Accurate Diagnosis

- Visual observation of individual palm
- Visual observation of entire group of palms or entire landscape
- Sample for laboratory diagnosis (but only if necessary or useful)

Visual Observation of Individual Palm

- *sometimes it is very obvious*

Thielaviopsis Trunk Rot

Severe Boron Deficiency

Visual Observation of Individual Palm

- *sometimes it is not obvious*

Symptoms due to disease or nutrient deficiency?

Visual Observation of Entire Group of Palms

If most of the palms are exhibiting the same symptoms at the same time, usually abiotic.

Visual Observation of Entire Group of Palms

Visual Observation of Entire Group of Palms or Entire Landscape

- Compare with normal, healthy palm
- What does rest of landscape look like?

Sample for Laboratory Diagnosis but only to

- confirm a visual diagnosis, and only if laboratory diagnosis is meaningful
- aid in disease diagnosis
  - but only if sample correct tissue
- diagnosis of some physiological disorders
  - two disorders may result in same symptoms

Sample for Laboratory Diagnosis but . . .

- **Must make as accurate as possible visual diagnosis first, before sampling!!!!!!!!!!!!!**
- **Cannot obtain an accurate lab diagnosis without sampling the <u>correct</u> plant tissue**
- **May need to double sample**
- **Soil and root samples are not very useful**

Sample the Correct Plant Tissue

Disease or Nutrient Deficiency?

- Visual diagnosis is critical
- Lab can always isolate "potential" pathogens, but those "pathogens" may not be the actual cause of the problem

Disease or Nutrient Deficiency?

If you are unable to make visual diagnosis, then double sample – one for disease and one for nutrients. Learn deficiency symptoms!!

- Disease sample: tissue with symptoms
- Nutrient sample: middle leaflets of youngest, fully expanded leaf

Disease or Nutrient Deficiency or Both?

Diseases look very similar to nutrient deficiencies!

Or, they may occur after the nutrient deficiency occurs!

Or, they may occur at the same time!

Note Location Within Canopy And Distribution on Individual Leaves

Sample the Correct Plant Tissue

Disease or Nutrient Deficiency or Both?

- **Visual diagnosis is critical**
  - **pathogen may be only one part of the problem**

Example

Foxtail palms grown in alkaline soil or potting mix are prone to iron deficiency, which leads to Exserohilum leaf spot

Sample the Correct Plant Tissue

Soil and Roots for Disease Diagnosis??

- **In many cases, diagnosis is a process of eliminating potential causes for the symptoms observed**
- **But, you need to think logically about what the potential causes could be so that you can obtain appropriate sample**

Sample the Correct Plant Tissue
Diseases

- **Roots: no documented primary root diseases in the landscape in Florida**

  - root problems in landscape are almost always secondary from planting too deep, planting wrong palm in wrong site, etc.

- **Determine where roots are located (should be at or near soil surface), but seldom need to obtain root sample**

Sabal palms were planted too deep, and into wet site.

No new roots developed.

“Potential” pathogens were isolated, but that was not the real issue!

What should you sample?

DISEASE DIAGNOSIS REPORT

Lab Number: 2617 Sample ID: Royal palm

DIAGNOSIS: A high amount of Fusarium was isolated from the soil, 600 colony forming units per gram. The sample tested negative for Pythium and Phytophthora.

CONTROL: The fungi isolated here may or may not be pathogenic types. Treatments options include Clearys 3336, Medallion or Heritage.

Lab Number: 2618 Sample ID: Royal palm roots

DIAGNOSIS: The fungus Botryodiplodia was isolated from the root tissue in low incidence.

CONTROL: Treat as for lab number 2617.

- Lightning most likely (it was the season!)
- Thielaviopsis trunk rot? confirm by removing the palm and conduct post-mortem
- Root and soil samples were waste of money and time (and confusing)

Samples for Laboratory Disease Diagnosis

- NEVER obtain soil sample for disease diagnosis
- Soil samples for disease diagnosis not accepted by UF clinics
- Other laboratories will process soil samples for disease diagnosis, but the results have no meaning!

Samples for Laboratory Diagnosis Summary

- Cannot obtain an accurate lab diagnosis without sampling the correct plant tissue
- Must make as accurate as possible visual diagnosis first, before sampling
- Use lab diagnosis as confirmation of visual diagnosis
- May need to double sample

Be a Detective!

SureLook Holmes

- **Keep an open mind – anything is possible**
- **Find out exactly what cultural practices have been used in the nursery or landscape – especially fertility practices and pesticide applications for last 6-12 months**
- **Think about the weather patterns (cold damage may take awhile to appear and recover from)**
- **Provide the correct tissue to the laboratory**