It's not a disease (or is it?): Managing urban #foresthealth

Carrie Lapaire Harmon, PhD
Extension Plant Pathologist
UF Plant Diagnostic Center and
Southern Plant Diagnostic Network

Today's topics

- Overview of diagnostics and sample submission
- New diseases, disorders, and mgmnt
  - #NotADisease (herbicides)
  - Diplodia ("Bot canker") of oaks
  - Needle blight of pines
  - Palm problems

Diagnosis is hard, but it's not rocket science

- Plants only have so many ways to tell us they're sick (symptoms)
- Plants have needs – fulfill the needs and disease will be the exception, not the rule (right plant, right place)
- Plants don't live forever
- Plants are not plastic (they will never do well in median strips, parking lots, planted in fill dirt, etc.)
- Dead plants tell no tales (crispy twigs or turf are never sufficient for diagnosis)
- A photo is worth a thousand dead plant samples (can't get a good sample, at least get a good picture)

A few reminders

- Disease = plant + pathogen + environment + time
- Disorder – not a disease (no pathogen)
- Symptom – What the plant says (limited vocabulary!)
- Sign – what the pathogen says (may be tough to see)

Appropriate disease samples

- Leaf spot/foliar blight
  - ~ A dozen affected leaves or a whole intact stem with leaves
- Wilt diseases
  - Whole plant, nothing dead. Photos and phone call!
- Virus diseases
  - New symptomatic tissue, note insects present
- Mature trees/palms
  - Photos and a phone call first

- All samples must have clear information on irrigation, age of planting, number affected, when symptoms started, and any pesticides applied.

Ask questions

- What's the plant? (know what normal looks like, what conditions the plant likes)
- What were the growing conditions? (SSICC: sun, soil, irrigation, chemicals, culture)
- What is the submitter worried about? (symptoms, other?)
- What else does the submitter know? (stealth diagnostics – folks often know a lot more than they'll write on a submission form)

Use your tools

- Them interwebs - Google is great, Bing not so much, for science. Use trustable sources. UC Extension – yes. GardenersForAGreenerPlant.com, maybe not
- Your extension specialists
- Got a microscope? Get trained to use it!
- Practice collecting plant samples so you can explain to others

Not diseases: herbicides

- What?
  - Shortened internodes
  - Bud proliferation
  - Tip dieback
  - Bud necrosis

Hibiscus (Rose of Sharon)

Privet

Look for mites, thrips, and ask about lawn weed and feed products

#NotADisease: herbicides

UF IFAS Extension UNIVERSITY of FLORIDA

FOR332

Effects of Metsulfuron-Methyl-Containing Herbicides on Ornamentals[1]

Chris Marble, Jason Smith, Timothy K. Broschat, Adam Black, Ed Gilman, and Celeste White[2]

Introduction

Over the past few years, there have been num
ries regarding damage to ornamental plants g
turfgrass areas that have been treated with me
methyl-containing herbicides. Most of the ino
in regards to stem die-back, brown "fried" or
foliage, delayed leaf appearance, and patches
(dead tissues) in the phloem (plant's vascular
(Figure 1). Injury symptoms are typically repo
four weeks following applications made durin
weather (although not exclusively).

Metsulfuron-methyl, also known as MSM, is

ranging from 0.25 to 1 ounce of formulated product per

Figure 2. Live oak injury following a metsulfuron application to the root zone at a 1 oz. per acre rate.
Credits: Jason Smith, UF/IFAS

Figure 1. Phloem necrosis shown as streaking brown sections of wood exposed by peeling the bark back in a live oak (*Quercus virginiana*) branch affected by metsulfuron-methyl.
Credits: Jason Smith, UF/IFAS

- Uptake over time
- Might not see effects until months later
- Look for (dicot) weed-free lawns around dicot ornamentals

Carrie L. Harmon, UF-IFAS Plant Diagnostic Center

Diplodia on oaks

- "Bot canker" (*Botryosphaeria* and *Diplodia* are in the same fungal family)
- Two species, *D. corticola* and *D. quercivora*, in FL
- Branch cankers
- Flagging
- Tip dieback
- Phloem necrosis
- Some species have "bleeding" sap
- Long streaks of brown in the sapwood in trunk infections
- Wedge-shaped discoloration

J. Smith, UF

Carrie L. Harmon, UF-IFAS Plant Diagnostic Center

Diplodia on oaks

- Likely enters plants through wounds, leaf scars, open stomata, lenticels
- Seen mostly in planted nursery stock (cultivated plants)
- Often live harmlessly in the plant until stress
  - Transplant shock, drought, flooding, freeze damage, herbicide, soil compaction
- Fungus produces a toxin and also interferes with wound healing/callus formation

J. SMith, UF

T. Dreaden, UF

A. Black, UF

Diplodia on oaks

- No fungicidal management effective
- Prune out cankers, sterilizing pruners between cuts
- Apply fungicide to pruning wounds (benzimidazoles)
- Prevent tree stress, especially wounding, transplant shock, and drought

Needle blight of pines

- Slash pine problem fall 2012 in central FL
- Significant dieback in stands of planted pines
- Natural stands unaffected
- Bleeding cankers, dieback, mortality
- *Diplodia* (*Sphaeropsis*) spp. isolated
  - Same species that cause "pine tip blight" throughout US
- *Mycosphaerella gibsonii* also isolated (needle blight, Cercospora blight)

J. Smith, UF

Carrie L. Harmon, UF-IFAS Plant Diagnostic Center

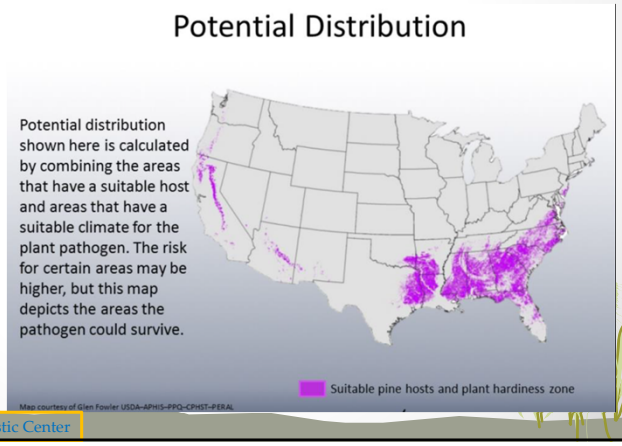
Needle blight of pines

- Numerous species susceptible, most pines
- Symptoms include lesions, needle drop, stunting, mortality
- Lesions do not have reddish tint symptomatic of other diseases
- Primarily a disease of seedlings and samplings, may cause disease in mature trees
- Tree age and environmental conditions predict likelihood of mortality

Carrie L. Harmon, UF-IFAS Plant Diagnostic Center

Needle blight of pines

- Spreads through nursery stock (long-distance)
- Spreads within canopy by windblown or splashing spores



Carrie L. Harmon, UF-IFAS Plant Diagnostic Center

Needle blight of pines

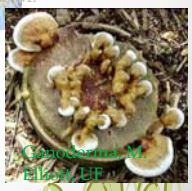
Management (nurseries)

- Survey often, reduce overhead watering, lower humidity
- Remove unthrifty seedlings/nursery stock and burn
- Fungicides

Carrie L. Harmon, UF-IFAS Plant Diagnostic Center

Palms, palms, everywhere palms (are dying, it seems)

- Phytoplasmas (LY and TPPD)
- Fusarium wilts (palmarum and canariensis)
- Abiotic (nutrition, transplant shock, lightning, deep planting)
- Thielaviopsis and Ganoderma
- Rachis blights
- Palm skeletonizer, weevils, red palm mite



Carrie L. Harmon, UF-IFAS Plant Diagnostic Center

Lethal Yellowing (LY) & Lethal (Texas Phoenix Palm) Decline (TPPD)

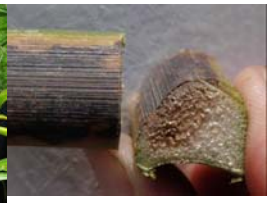
- Plant hopper vector
- Shared symptoms: fruit drop/flower necrosis, collapse of spear leaf
- TPPD: fast decline of older leaves, late stage root rot and instability (sabal palms, Phoenix palms, others)

M. Elliott, UF

Carrie L. Harmon, UF-IFAS Plant Diagnostic Center

Fusarium, nutrition, and look-alikes

Fusarium wilt (not always wilt!)



Rachis blight

Nutritional

Palm Problems Key

http://flrec.ifas.ufl.edu/palmprod/palm-problems-key/

Sampling and diagnosis

- Photos and a phone call are always the best way to start (pdc@ifas.ufl.edu and 352-392-1795)
- Fusarium wilts, rachis rot:
  - symptomatic rachis
  - culture, then if we get Fusarium, PCR
- Phytoplasma diseases:
  - sawdust from the trunk (no pseudobark)
  - PCR
- Ganoderma:
  - Must have the conk (not rotted, dry paper bag)
  - Microscopy of the spores

Other Woody Ornamental Problems

- Bacterial leaf scorch
- Ganoderma
- Herbicide damage

Bacterial leaf scorch

- Bacterium: *Xylella fastidiosa*
- Leaf hopper vector
- Very wide host range (woody plants)
- Symptoms: marginal leaf necrosis and branch dieback; symptoms are progressive; eventually lead to death, but may take a long time
- PCR of sap

Carrie L. Harmon, UF-IFAS Plant Diagnostic Center

Ganoderma

- Fungus: *Ganoderma* spp.
- Wounding/root grafts
- Very wide host range (woody plants)
- Symptoms: branch dieback; symptoms are progressive; may eventually lead to death, but may take a long time; watch tree for structural issues
- Some *Ganoderma* fungi just eat dead plants (saprophytic)
- Microscopy of conk

Carrie L. Harmon, UF-IFAS Plant Diagnostic Center

#NotADisease

- Disease is the exception
- Right plant, right place, right care = happy trees
- Train your eye for disease while appreciating all the healthy plants around you (#EveryoneIsAPlantPathologist)

Carrie L. Harmon, UF-IFAS Plant Diagnostic Center

Thank you

- Carrie Lapaire Harmon
- UF Plant Diagnostic Center

Google UF PDC

UF PlantDiagnosticCenter

@FLPlantDr