Pathogens
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IFAS Extension

PLAYING DETECTIVE

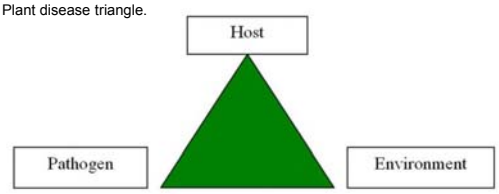
DISEASE?

ENVIRONMENTAL STRESSES?

MANAGEMENT?

Common Ornamental Diseases

Plant disease triangle.



P.F. Harmon, UF/IFAS

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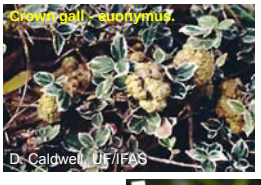
TYPES OF PATHOGENS

- Fungi - powdery mildew, most leafspots
- Bacteria - bacterial leafspots, bacterial rots, crown gall on stems
- Virus - mosiacs, ringspots, stunting

Common Ornamental Diseases

- **Crown and *Sphaeropsis* Gall**



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Common Ornamental Diseases

- ***Ganoderma* butt rot**

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Common Ornamental Diseases

- http://edis.ifas.ufl.edu/PP100


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edis

Ganoderma Butt Rot of Palms[1]

Monica L. Elliott and Timothy K. Broschat[2]

Summary

- Ganoderma butt rot is caused by the fungus *Ganoderma zonatum*. The fungus degrades or rots the lower 4–5 feet of the trunk.
- All palms are considered hosts of the fungus. The fungus is not a primary pathogen of any other plant species.
- Symptoms may include wilting (mild to severe) or a general decline. The disease is confirmed by observing the basidiocarp (conk) on the trunk. This is a hard, shelf-like structure that will be attached to the lower 4–5 feet of the palm trunk. However, not all diseased palms produce conks prior to death.
- A palm cannot be diagnosed with Ganoderma butt rot until the basidiocarp (conk) forms on the trunk, or the internal rotting of the trunk is observed after the palm is cut down.
- The fungus is spread by spores, which are produced and released from the basidiocarp (conk).
- Conditions that are conducive for disease development are unknown.
- There are currently no cultural or chemical controls for preventing the disease or for curing the disease once the palm is infected.
- A palm should be removed as soon as possible after the conks appear on the trunk. Remove as much of the stump and root system as possible when the palm is removed.
- Because the fungus survives in the soil, planting another palm back in that same location is not recommended.

Introduction

Ganoderma butt rot is a lethal disease of palms, both in the landscape and natural settings. While the disease is more prevalent in the southern half of the state, where palms are a [illegible] it is certainly not restricted to that area. The fungus that causes the disease is distributed throughout Florida, from Key West to Jacksonville to Pensacola. It [illegible] in Georgia and South Carolina.

Hosts

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Common Ornamental Diseases

- ***Phytophthora*** **root rot and dieback**


Azalea with wet root rot.

G.W. Simone, UF/IFAS

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Common Ornamental Diseases

- **Powdery and downy mildew**


Azalea with powdery mildew.

D. Caldwell, UF/IFAS

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LEAF SPOTS

Usually fungal
Encouraged by:

- High humidity/ excess moisture
- Wet leaves

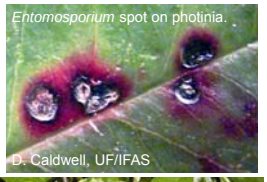
Spread by

- Wind, water, Equipment

GREY LEAF SPOT

Common Ornamental Diseases

- **Leaf spots and blight**


Entomosporium spot on photinia.

D. Caldwell, UF/IFAS


Cercospora spot on pittosporum.

D. Caldwell, UF/IFAS


Taphrina spot on oak.

H. Dankers, UF/IFAS

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Turf Diseases - Fungi

- **Similar to plants, but can't make own food.**
- **Cause almost all turf diseases in Florida.**
- **Reproduce by spores.**
- **Grow by making hyphae, thread-like filaments.**
- **Symptoms: usually spots or lesions.**

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M.L. Elliott, UF/IFAS

Turf Diseases – Dollar Spot

- Usually occurs fall through spring.
- Likely appears where N is lacking and when damp, humid conditions exist.


M.L. Elliott, UF/IFAS

Turf Diseases – Dollar Spot

- 1 to 3-in wide brown to straw-colored patches of dead grass.
- Uneven, light tan lesions with obvious brown borders on the leaves at the outside edge of the patches.
- Patches do not get bigger. As the number of patches increases, they may merge to form larger patches.
- Mycelia, fungal strands, may appear in early morning hours when dew present.

M.L. Elliott, UF/IFAS

Turf Diseases – Fairy Rings

- There are several types of fairy rings.
- Top left: Type 2 ring.
- Lower left: Type 3 ring.
- Bottom: Poisonous mushroom from ring.

M.L. Elliott, UF/IFAS

Turf Diseases – Brown Patch

G.W. Simone, UF/IFAS

Turf Diseases – Brown Patch

- Soft, dark rot seen at base of leaf.
- Leaf has rotten smell.
- Patches can become several feet wide.
- St. Augustinegrass: may be confused with herbicide injury.


M.L. Elliott, UF/IFAS


D. Caldwell, UF/IFAS

BROWN PATCH

Encouraged by:
High humidity/ excess moisture
Wet leaves
temperatures below 80°F
excess nitrogen

Spread by:
Wind, water,
Equipment

Affects:
All warm season grass

BROWN PATCH

Soft Rot Develops at base of leaves

leaves pull out easily
Does not affect roots

Begins as:
small patches
yellow, brown
expands
may have green
grass in middle

BROWN PATCH

Turf Diseases – Take-All Root Rot

M.L. Elliott, UF/IFAS

Turf Diseases – Take-All Root Rot

M.L. Elliott, UF/IFAS

- **Above-ground: chlorotic patches.**
- **May cause stolons to rot.**
- **When severe, bare patches result.**

Turf Diseases – Rust

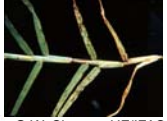
G.W. Simone, UF/IFAS

Turf Diseases – Rust

G.W. Simone, UF/IFAS

Turf Diseases – Helminthosporium leaf spot

M.L. Elliott, UF/IFAS



G.W. Simone, UF/IFAS

- **Caused by 3 fungi.**
- **Most often and obvious on bermudagrass.**
- **Can cause turf to have a purple appearance.**

Turf Diseases – Gray Leaf Spot

P. Harmon, UF/IFAS

Turf Diseases – Gray Leaf Spot

- Causes olive-green to brown spots.
- Spores give spots a silky gray color.
- Entire leaf can turn brown.
- Common on St. Augustinegrass.

P. Harmon, UF/IFAS

Turf Diseases – Anthracnose

- Causes red – brown spots with halos.
- Leaves turn yellow and die – appear as small, yellow patches.

G.W. Simone, UF/IFAS

Turf Diseases – Slime Molds

M.L. Elliott, UF/IFAS

Turf Diseases – Pythium Root Rot

- Occurs at anytime of year.
- Compacted, poorly drained soil are conducive.
- Turf becomes chlorotic and thins out.
- Roots appear off-color with few hairs.

ENVIRONMENTAL STRESS

Temperatures

too high or low for particular species

Drought

Excess rainfall or irrigation

Excess shade/ sun

MANAGEMENT

Proper mowing height

- Don't remove more than 1/3 of the blade at a time

Watering

- only enough to wet the root zone
- Water in morning

Proper fertilization

- Not too much or too little

Sanitation practices

- Remove infected material/ litter

Some slides courtesy of:
Author: Tom Weissling, University of Florida

Photos: University of Florida
University of California
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Some slides from
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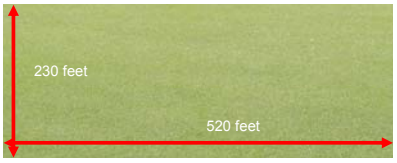
Mary Beth Henry
Thanks!

Area Measurement

- **Squares and rectangles**



230 x 520 = 119,600 ft²

119,600 ÷ 43,560 = 2.75 acres

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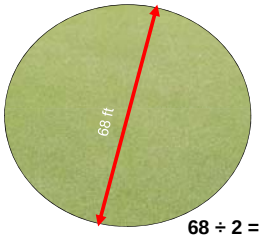
Area Measurement

- Circles



68 ÷ 2 = 34 ft

34 x 34 x 3.14 = 3,630 ft^2

1 acre = 43,560 sq ft

Π= 3.14

Measure Ground Speed

- What is the speed of a golf cart sprayer driven over a test run of 200 feet if three runs are timed at 40, 43, and 39 seconds?
  - (40 + 43 + 39) ÷ 3 = 40.7 seconds
  - 40.7 ÷ 60 seconds per minute = 0.68 minutes per test run
  - 200 feet ÷ 0.68 = 294.1 feet per minute
  - Feet per minute ÷ 88 = mph
  - 294.1 ÷ 88 = 3.3 mph

Feet per minute ÷ 88 = mph

Calibrate by Volume

Percent Dilution

Weed Species	Rate (QT/A)	Water Volume (GPA)	Hand-Held % Solution
Bermudagrass	3-5	3-20	2%

For control, apply 5 quarts of this product per acre. For partial control, apply 3 quarts per acre. Treat when Bermudagrass is actively growing and seedheads are present. Retreatment may be necessary to maintain control.

Percentage	Decimal Equivalent
100%	1.00
10%	0.10
2%	0.02
0.5%	0.005

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Dilution Example

- To treat 18 azaleas:
  - Label rate of insecticide = 3 ounces per gallon
  - 12 seconds to spray 1 azalea
  - 10 ounces collected in 12 seconds
  - 18 azaleas x 10 ounces = 180 ounces
  - 180 ÷ 128 = 1.4 gallons
  - 3 ounces x 1.4 gallons = 4.2 ounces

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Dilution Example

- To mix 3 gallons of a 2% solution:
  - 2 ÷ 100 = 0.02
  - 0.02 x 128 = 2.6 ounces
  - 2.6 x 3 = 7.8 ounces


UF/IFAS Pesticide Information Office

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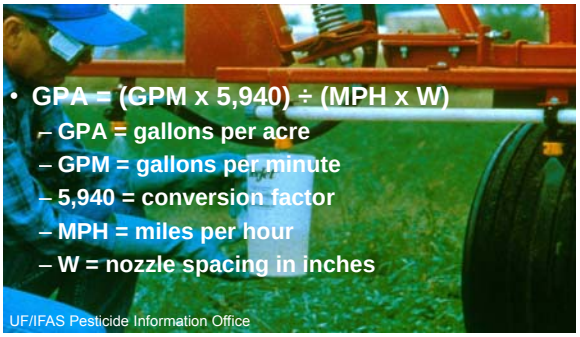
1 gallon = 128 oz

Collect Output


UF/IFAS Pesticide Information Office

- GPA = (GPM x 5,940) ÷ (MPH x W)
  - GPA = gallons per acre
  - GPM = gallons per minute
  - 5,940 = conversion factor
  - MPH = miles per hour
  - W = nozzle spacing in inches

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Collect Output

- Will use a spray volume of 30 GPA
- MPH = 4.5
- Nozzle spacing = 20 inches
- Average nozzle output = 0.44 GPM
- GPA = (0.44 x 5,940) ÷ (4.5 x 20) = 29 GPA

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GPA = (GPM x 5,940)
÷ (MPH x W)