Key Plants and Key Pests in Central Florida Landscapes

Presented by:
Theresa Badurek, MLA
Urban Horticulture Extension Agent

Created by Eleanor Foerste, Dr. Cathy Neal, Celeste White
University of Florida Extension
IPM
Integrated Pest Management

• Natural processes of control are emphasized
  – Genetic - host plant resistance
  – Pest exclusion
  – Prevention and through cultural practices
  – Physical Control
  – Biological control through natural enemies
  – Chemical control as a last resort

• Tolerance
• Scouting & Monitoring
Shrubs

- Hibiscus
- Holly
- Indian Hawthorn
- Juniper
- Ligustrum
- Viburnum
Hibiscus

Hibiscus rosa-sinensis
Hibiscus - Key Pests

**Insects**
- Aphids
- Scale
- Mealybugs
- Spider mites
- Whiteflies

**Nematodes**
- Root knot

**Other**
- Environmental stress
Aphids

- Sooty mold
- Distorted new growth
- Pear-shaped insects with cornicles
- Spring and throughout growing season
Aphids

Management

- Natural biological control
- Soaps, oils, insecticides

Parasitic wasp

Aphid mummies
Scale

- Chlorotic feeding damage on upper leaf surfaces
- Oval or round stationary insects, various colors
- Sooty mold with soft scales
Scale

- Year round occurrence
- Crawlers spring through fall

Management

- Natural biological control
- Oils or insecticides

*Parasaissetia nigra*, Nigra scale feeds on young stems of hibiscus.
Pink Hibiscus Mealybug

- Rosetting of terminal growth with deformed flowers.
- Stunting of plants
- Over 200 host plants
- Hibiscus is favored
- Biological control
- Systemic pesticide - Imidacloprid
Spider Mites

- Stippled or bronzed leaves
- Mites, eggs, cast skins, webs visible with hand lens
- Warm and dry conditions favor two-spotted mites
- Cool and moist conditions favor southern red mite

Southern red mite *Oligonychus ilicis*
Two-spotted spider mite *Tetranychus urticae*
Spider Mites

Management

- Biological control - predatory mites
- Soaps, oils, Neem oil, miticides
Whiteflies

- Leaves pale or spotted
- Sooty mold
- Adults are tiny, white, moth-like
- Nymphs are translucent yellow ovals

Silverleaf whitefly *Bemisia argentifolii*
Whiteflies

Giant whitefly

- Larger
- Obvious waxy filaments
Whiteflies

Management

• Silverleaf and giant whitefly are very difficult to control
• Biological control
• Soaps, oils, insecticides

Citrus whitefly
Dialeurodes citri
Root Knot Nematodes

- Decline and thinning of canopy
- Roots may be brown, stunted and galled

Management

- Provide adequate water and fertilizer
- Remove and replace plants and soil
- Replace with tolerant species
Environmental Stress

• Flower buds drop before opening
• Leaves turn yellow and may drop

Cold damage
Environmental Stress

**Causes**

- Response to injury or stress
- Insects or nematodes
- Excessive water or fertilizer
- Cold temperatures

**Management**

- Correct cultural problems
- Provide cold protection
- Prune and re-grow
Holly

Ilex species
Holly - Key Pests

**Insects**
- Florida wax scale
- Tea Scale

**Diseases**
- Cylindrocladium leaf spot
- Dieback
- Fusarium root rot
- Sphaeropsis gall

**Nematodes**
- Root knot
Florida Wax Scale

- Creamy, round spots on stems and leaves
- Chlorotic spots
- Sooty mold
- Leaf drop
- Immatures black with white fringe
Florida Wax Scale

- Mature scale present year round
- Monitor crawlers spring - summer

Management
- Natural biological control
- Soaps, oils, insecticides

*Cerothiplaster floridaeis*
Tea Scale

- Chlorotic feeding damage on leaves
- Undersides of leaves white with waxy threads
- Tiny, armored scales
- Mature scale present year round
Tea Scale

Management

• Conserve natural biological control
• Soaps, oils, insecticides

Fiorinia theae
Cylindrocladium Leaf Spot

- Dark purple to black circular leaf spots
- Leaf drop
- Twig dieback
- Common on *I. vomitoria*
- Also occurs on *I. crenata, I. cornuta, I. opaca*
Cylindrocladium Leaf Spot

- Warm temperatures, high humidity, excessive leaf wetness
- Spreads by splashing water

Management
- Adjust irrigation to keep foliage dry
- Remove fallen leaves
- Fungicides
Dieback

- Holes or bare areas in plant
- Most common in yaupon holly
- Spreads by splashing water
- Injuries allow points of entry
- Occurs most often in dense or excessively sheared plantings
Dieback

Pink limb blight

- Can be caused by several fungi
- Fungal signs may not be apparent

Management

- Prune out below symptoms
- Plant replacement
- Fungicides after pruning may limit new infections
Sphaeropsis Gall

- Swellings on young twigs
- Irregular galls on older wood
- Witches broom
- Horizontal branches “tip up”
- Dieback
Sphaeropsis Gall

- Most severe on ‘East Palatka’ and ‘Savannah’
- May spread rapidly by pruning

Management

- Prune below symptoms
- Don’t prune when rainfall is expected
- Sterilize pruners
- Fungicides after pruning may limit new infections
- Remove severely infested plants

Galls

Witches broom
Root Knot Nematodes

Decline and thinning of canopy

Roots may be brown, stunted and galled

Susceptibility varies by species

Management

- Provide adequate water and fertilizer
- Remove and replace plants and soil
- Replace with tolerant species
Indian Hawthorn
Raphiolepis indica
Indian Hawthorn
Key Pests

**Insects**
- Florida wax scale
- Chili thrips

**Diseases**
- Entomosporium leaf spot
Florida Wax Scale

• Mature scale round, convex, creamy
• Immatures darker with white fringe
• Sooty mold
• Chlorotic spots, leaf drop

*Ceroplastes floridensis*
Florida Wax Scale

- Present year round
- Monitor crawlers spring - summer

Management
- Natural biological control
- Soaps, oils, insecticides
Chilli Thrips

- Over 100 different hosts
  - 40 different families
- Very difficult to diagnose
  - Much smaller than other thrips

Management

- Most chemical controls for thrips are effective
Entomosporium Leaf Spot

- Dark leaf spots with purple borders
- Growth distortion
- Leaf drop
- New growth flushes most susceptible
- Optimum temperature 59-77° F
- 9-12 hours leaf wetness or high humidity
Entomosporium Leaf Spot

Management

• Minimize overhead irrigation, especially at night
• Improve air circulation
• Maintain low fertility level
• Systemic and foliar fungicides

Conidia are spread by splashing water
Juniper - Key Pests

**Insects**
- Spider mites
- Webworm

**Diseases**
- Mushroom root rot
- Rhizoctonia web blight
- Wet root rots
Spider Mites

- Pale or off-color foliage
- Mites, eggs, cast skins, webs visible with hand lens
- Two-spotted spider mites (warm and dry)
- Southern red mites (cool and moist)
- Spruce mites (winter)
Spider Mites

Management

- Biological control - predatory mites
- Soaps, oils, miticides

Two-spotted spider mite
*Tetranychus urticae*

Southern red mite
*Oligonychus ilicis*
Webworm

- Individual branches turn red and die
- Webbing holds foliage and soil together at base of stem
- Girdled bark

*Glyphidocera juniperella*
Webworm

• Ground cover types of juniper affected most often
• Girdling damage occurs in winter, symptoms show in spring

Management

• Remove dead branches
• Insecticides, Bt
Mushroom Root Rot

- Slow decline, thinning of canopy
- Gray-green color
- White mycellium under bark at soil line
- Wide host range
- Associated with old plantings
Mushroom Root Rot

Management

• Remove diseased plants and roots
Rhizoctonia Web Blight

- Random areas of dead foliage
- Both new and old growth affected
- Threadlike mycelium visible with hand lens
Rhizoctonia Web Blight

- Soil-borne fungus, splashes into canopy
- Hot, wet weather

Management
- Minimize overhead irrigation
- Improve air circulation
- Approved fungicides
Wet Root Rots

- Off-color foliage, oldest foliage first
- Branch or plant death, may be one-sided
- Roots dark and rotted, strip off easily
Wet Root Rots

- Disease triggered by excessive soil moisture
- Contributing factors:
  - Poor drainage
  - Over-watering
  - Planting too deep
  - Shallow rooting
  - Other cultural conditions
Wet Root Rots

Management

• Correct cultural problems
• Apply fungicide if diagnosed early
Ligustrum

*L. sinense*

*L. japonicum*
Ligustrum - Key Pests

**Insects**
- White peach scale

**Diseases**
- Cercospora leaf spot
- Mushroom root rot
- Wet root rots
**White Peach Scale**

- Heavy infestation forms white crust on stems and twigs
- Common pest on *L. sinense*, not *L. japonicum*

**Management**
- Monitor for parasites (beneficial insects)
- Horticultural soap and oil
Cercospora Leaf Spot

- Yellow leaf spots with purple margins; brown raised areas on undersides of leaves
- Typical on older plantings of *L. japonicum*
- Poor plant health, dense plantings, shade
- Late summer and fall
Cercospora Leaf Spot

Management

• Reduce leaf wetness
• Avoid excessive pruning
• Provide adequate fertilizer and water
• Use approved fungicides; spray both leaf surfaces
Mushroom Root Rot

- Slow decline, thinning of canopy
- Desiccation
- Wide host range
Mushroom Root Rot

- White mycellium at soil line
- Mushrooms sometimes seen

Management

- No control on existing plants
Wet Root Rots

- Off-color foliage, oldest foliage first
- Branch or plant death; may be one-sided
- Roots dark and rotted, strip off easily
Wet Root Rot

Management
• Correct cultural problems
• Apply fungicide if diagnosed early

• Disease triggered by excessive soil moisture
• Contributing factors:
  • Poor drainage
  • Over-watering
  • Planting too deep
  • Shallow rooting
  • Other cultural conditions
Viburnum

V. odoratissimum, V. suspensum
Viburnum - Key Pests

**Insects**
- Aphids
- Spider mites
- Thrips
- Whiteflies

**Disease**
- Mushroom root rot
Aphids

- Pear-shaped insects with cornicles
- Sooty mold
- Distorted new growth
- Spring and throughout growing season

Management

- Natural biological control
- Soaps, oils, insecticides for high populations
Spider Mites

- Stippled or bronzed leaves
- Mites, eggs, cast skins, webs visible with hand lens
- Southern red mites most common
- Cool and moist conditions favorable

Management

- Natural biological control
- Soaps, oils, Neem oil, miticides
Thrips

- Flecked, bleached or silvered appearance
- Spots of shiny black excrement
Thrips

- Adults tiny, black, elongated
- Nymphs translucent
- Peak during spring

Management
- Use insecticides for severe infestations, spinosad - biological
Whiteflies

- Leaves pale or spotted
- Sooty mold
- Adults are tiny, white, moth-like
- Nymphs are translucent yellow ovals

Citrus whitefly  
*Dialeurodes citri*

Silverleaf whitefly  
*Bemisia argentifolii*
Whiteflies

Management

- Biological control – parasitic wasps
- Soaps, oils, insecticides
- Silverleaf is more difficult to control
Mushroom Root Rot

- Slow decline, thinning of canopy
- Desiccation
- White mycelium under bark at soil line
- Wide host range
- Can occur anytime; most symptoms appear in summer
Mushroom Root Rot

Management

- Remove diseased plants and roots, and adjacent plants in a hedge
Trees

- Crape Myrtle
- Oak
- Pine
- Southern Magnolia
Crape Myrtle
*Lagerstroemia indica*
Crape Myrtle Key Pests

**Insects**
- Crape myrtle aphid
- Metallic beetles

**Disease**
- Powdery mildew
Crape Myrtle Aphid

- Sooty mold
- Distorted new growth
Crape Myrtle Aphid

- Yellow, pear-shaped insects with black spots on abdomen.
- Unlike most aphids, all adults of this species are winged.
- Late summer through fall
- Host specific

*Sarucallis kahawaluokalani*
Crape Myrtle Aphid

Management

- Natural biological control
- Soaps, oils, insecticides

Lady bug larvae feeding on aphids
Metallic Beetles

- Small blue beetles
- Leaf notching

Management
None recommended
Powdery Mildew

- White powdery growth on leaves, shoots and buds
- Growth distortion
- Leaf curling
- Fungus

Leveillula taurica
Powdery Mildew

- Cool, dry conditions
- Most severe in shade

Management

- Use resistant varieties
- Apply fungicides when needed
Oak

*Quercus* species
Oak - Key Pests

**Insects**
- Borers
- Caterpillars
- Insect-induced galls
- Twig girdler

**Diseases**
- Oak leaf blister
- Root and butt rots

**Other**
- Mistletoe
- Psocids
- Spanish moss
Borers

- Foliage discoloration, wilting, branch dieback
- Small holes in trunk
- Sap staining, sawdust or pellets on bark or at base of tree
- Tunnels may be seen if bark is removed
- Trees affected are generally weakened or wounded by another factor

Flathead borers
Roundhead borers
Ambrosia beetles
Clearwing moths
Carpenter worms
Borers

**Management**

- Keep trees healthy to prevent infestation
- Prune out dead and dying branches
- Remove and destroy severely infested trees
- Trunk applications of insecticides on nearby high-value trees
Caterpillars

- Holes or jagged edges in leaves, sometimes complete defoliation
- Caterpillars visible in trees, understory shrubs, on walls or other surfaces
- Pellets of frass under trees

**Eastern tent caterpillars**
*Malacosoma americanum*
Caterpillars

- Often occur after leaf emergence in spring
- Many types have one generation per year, others two to four
- Levels of infestation vary from year to year; outbreaks occur occasionally

Fall webworm *Hyphantia cunea*
Caterpillars

Management

• Populations usually kept in check by weather and natural enemies
• Feeding rarely causes serious damage to healthy trees
• Remove and destroy webs

Tussock moth caterpillar
Insect-induced Galls

- Galls occur in many forms, colors and shapes
- Plant response to egg-laying or feeding by wasps, midges, mites and others
- Small exit holes on outside of gall
Insect-induced Galls

Management

- Select gall-free plants for installation
- Leaf galls are harmless
- Prune out stem or branch galls if possible
Twig Girdler

- Wilted or dead twigs hanging in trees or on the ground
- Severed ends whittled to a dull point
- Damage occurs in the fall
Twig Girdler

- Beetle is seldom seen

Management
- Collect and destroy twigs from the ground
- No insecticidal control usually warranted
Oak Leaf Blister

- Raised or wrinkled blisters on new leaves
- Distortion of newly expanding leaves
- Brown necrotic areas on leaves later in season
- Infection occurs during mild, rainy spring weather

Management

- Fungicide use not recommended
- Rake fallen leaves to reduce inoculum
Root and Butt Rots

- Crown dieback, foliage discoloration, leaf drop
- Shelf fungi or mushrooms at or near base of tree
- Construction damage to roots or trunk
- Poor soil conditions
- Old age
Root and Butt Rots

**Management**

- Proper planting and establishment
- Avoid wounds to trunk
- Protection during construction activities
- Do not allow soil grade changes
- Remove fruiting bodies to reduce spread
Mistletoe

- Parasitic plant
- Usually noticed when oaks lose leaves in spring
- Seeds spread by birds
- Other hosts include pecan, hickory, other hardwoods

Management

- Prune at least 1 foot below attachment
Psocids

- Herds of small insects move actively on tree trunks or branches
- Tree may be covered with webbing
- Insects feed on lichens and fungi; cause no harm to plants
Spanish Moss

- Easily recognized moss hanging from branches of trees
- May be prolific on trees which have thinned from other causes of decline
- Epiphytic, not parasitic

Management

- Unnecessary in most cases
- If desired, remove mechanically
Pine

Pinus species
Pines - Key Pests

Insects

- Borers
- Pine bark beetles
- Pine sawflies
- Pine tip moths

Diseases

- Fusiform rust
Borers

- Branch wilt and dieback
- Holes, sap staining or sawdust
- Trees weakened or wounded by other factors
Borers

Management

• Keep trees healthy to prevent borers
• Remove infested or highly susceptible trees
• Trunk sprays of insecticides on nearby trees
Pine Bark Beetles

- Pitch tubes and/or boring dust on bark
- Foliage color changes to yellow to orange-brown
- Attracted to weak or wounded trees
- Southern pine beetles (SPB) may infect healthy trees
Pine Bark Beetles

- Adults bore through bark and construct egg galleries.
- Larvae tunnel in inner bark.
Pine Bark Beetles

Management

• Minimize tree stress, avoid root injury
• Remove weak or infested trees
• Insecticide application to trunk may protect healthy trees from SPB
Pine Sawflies

- Larvae look like caterpillars
- Large numbers feed on pine needles
- Stubby, tufted appearance of pine shoots
- Cyclical; 8-10 year intervals
- All pine species susceptible
Pine Sawflies

Management

- Populations usually controlled by natural enemies
- Use approved insecticides during outbreaks
- Promote recovery after attack and watch for bark beetles
Pine Tip Moth

- Needle drop, dying tips, color change
- Webbing and resin at shoot tips
- 3-5 generations per year
- Slash pine most susceptible
- Damage occurs most often on young trees
Pine Tip Moth

Management

- Damage is mostly aesthetic
- Prune out damaged tips if desired
Fusiform Rust

- Spindle shaped galls on branches or stems
- Bright yellow blisters in spring
- Fungus must spend part of life on pines, part on oak
Fusiform Rust

Management

• Prune branches below galls
• Remove trees with galls on main trunk or on branches near main trunk
Southern Magnolia
Magnolia grandiflora
Southern Magnolia – Key Pests

**Insects**
- Black twig borer
- Magnolia white scale

**Diseases**
- Algal leaf spot
Black Twig Borer

- Conspicuous twig dieback
- Twigs break off
- Entrance holes on undersides of twigs
- Problem is primarily aesthetic
- Prune out and destroy infected twigs

*Xylosandrus compactus*
Magnolia White Scale
or False Oleander Scale

- White armored scales, yellow-brown bodies underneath
- Clustered along midrib or scattered on both leaf surfaces
- Feeding damage causes yellow spots on leaves
Magnolia White Scale

• Adults present year-round, stationary
• Eggs and crawlers visible with hand lens

Management

• Mature trees usually do not require treatment
• Monitor parasitism—parasitic wasps help control
• Time contact insecticides for crawlers
Algal Leaf Spot

- Silvery gray, green or tan raised spots
- Most damaging on slow-growing, weakened plants
- No fungicides recommended
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