

What's Wrong With Your Plants and Why?

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Abiotic vs. Biotic Problems

- **Abiotic – non-living agent (non-infectious).**
 - Extreme temperatures
 - Excess or deficient water, light or nutrients
 - Soil compaction, soil grade changes
 - Damage from cultural practices: herbicides, fertilizers, pruning, mulching



Abiotic vs. Biotic Problems

- **Biotic – living agent** (infectious).
 - Pathogens - parasitic microorganisms that cause disease (fungi, bacteria, viruses, phytoplasma)
 - Pests – insects, mites, nematodes or mammals feeding on or damaging plants.



Abiotic vs. Biotic Problems

Symptom Progression

- Biotic disease – symptoms progress and nearby plants become infected.
- Abiotic disease – generally a lack of symptom progression. Does not spread.
 - Exception – nutritional deficiency symptoms progress slowly.



Abiotic disease – Herbicide Injury



What's Wrong?

Biotic or Abiotic

Steps in Problem Diagnosis

- **Know the Plant**
- Inspect the Site and Look for Patterns
- Look for Symptoms or Signs
- Examine cultural practices and weather conditions
- Identify Potential Causes
- Consult Resources and Reach Diagnosis

Steps in Problem Diagnosis

Know the Plant

- Identify the species and cultivar affected
- Know what problems commonly affect the species. For example:
 - Red Maple – Phyllosticta Leaf Spot, gloomy scale
 - Flowering Dogwood – Powdery Mildew, spot anthracnose

Steps in Problem Diagnosis

Know the Plant

- What's normal for specific plant?



Fall Needle Drop on White Pine

Steps in Problem Diagnosis

Know the Plant

- Look at the Whole Plant (foliage, stems, branches, leaves, and roots)
- Note the color, size, and thickness of the foliage
- Check the trunk and branches
- Examine the Roots

Check the Trunk and Branches



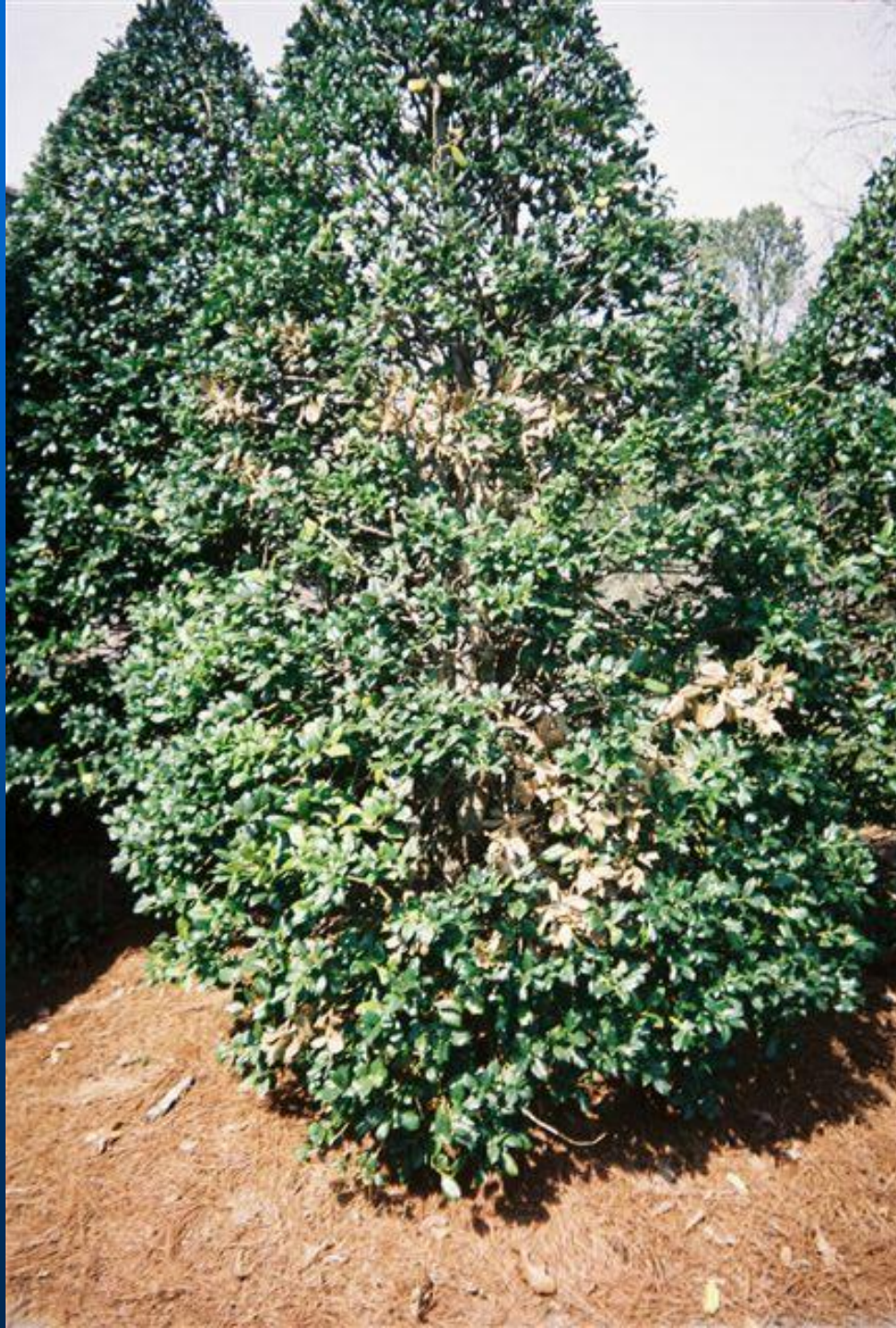
- Look for wounds, cankers, exit holes and other clues

Pitch Tubes on Bark, Southern Pine Beetle

Check the Trunk and Branches



- Sapsucker damage to sugar maple
- Don't mistake sapsucker damage for borer exit holes





Check the Trunk and Branches But...



Girdling Roots



Girdling Injury



Planted too deep



Deep Planting or Covered Later

- Check for flare at base of trunk



Girdling Roots

- Girdling roots are a common problem with trees that are planted too deep



Too Much Mulch Over The Root Ball



- Problems caused by too much mulch
 - Keeps trunk tissue wet
 - Can increase rodent damage
 - Mulch can intercept rain and irrigation
 - Can keep poorly drained soils too wet
 - Can encourage surface roots
 - Can encourage development of stem girdling roots

Planted too deep

Old root system has died



Steps in Problem Diagnosis

Inspect the Site and Look For Patterns

- Determine prevalence of problem.
 - Large area, all plants – generally abiotic.
 - Scattered, localized – generally biotic.
- Check for distribution of symptoms.
 - Uniform – generally abiotic.
 - Random – generally biotic.
- Are the symptoms/patterns related to geography? (soil, low spot, etc)
- Is the damage limited to one type of plant?
 - Multiple plant species - often abiotic
 - One species – often biotic

Observation of Field Patterns

Abiotic Problem



- Symptoms distributed in a large area. Damage pattern is uniform.

Gas leak from building

Observation of Patterns

Random vs. Uniform



Leaf Spot (Fungal) - Biotic



Marginal Leaf Scorch - Abiotic

Observation of Field Patterns

Random vs. Uniform



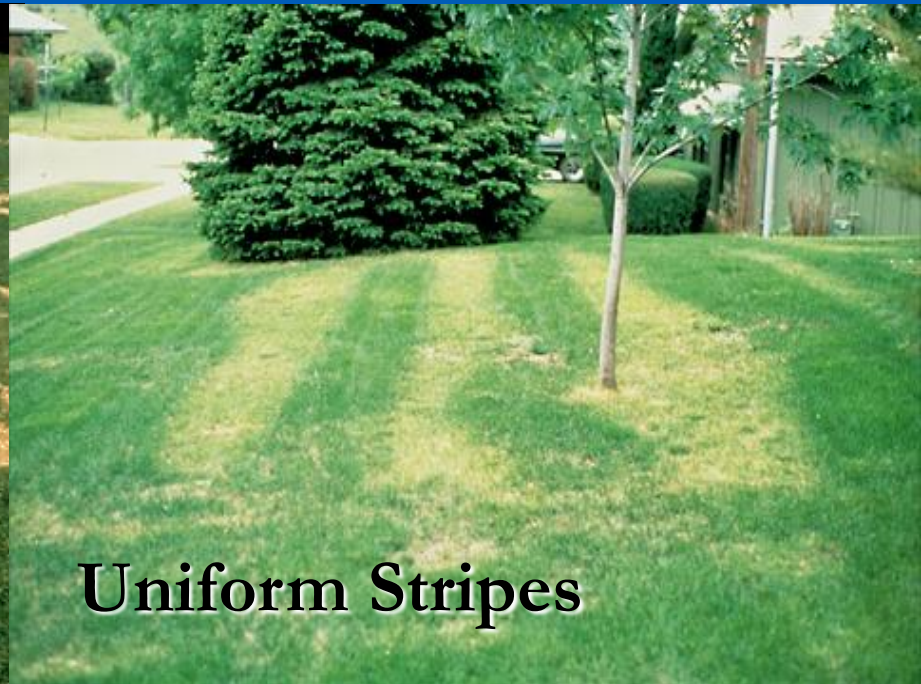
Boxwood Phytophthora Root Rot
Biotic



Oak Nutrient Deficiency - Abiotic

Observation of Field Patterns

Random vs. Uniform



Bermuda spring dead spot - Biotic

Fertilizer application problems - Abiotic

Steps in Problem Diagnosis

- Know the Plant
- Inspect the Site and Look for Patterns
- Look for Symptoms and/or Signs
- Examine Cultural Practices and Weather Conditions
- Identify Potential Causes
- Consult Resources and Reach Diagnosis

Look for Symptoms and/or Signs

- **Symptoms** - plant reactions or alterations of a plant's appearance due to a disease or disorder.
- **Signs** - actual presence of the pathogen, its parts or by-products seen on a diseased host plant.

Symptoms



Signs



Steps in Problem Diagnosis

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Steps in Problem Diagnosis

Examine Cultural Practices and Weather Conditions

- Ask questions - Collect as much background information as possible
- When was the problem noticed?
- Was the damage sudden or gradual?
- Has the problem spread?
- How old are affected plants?
- What cultural practices have been performed recently? Herbicide Sprays?

Hail Damage



Steps in Problem Diagnosis

■ **Identify Potential Causes**

- Consult Resources and Reach Diagnosis
- Get Laboratory Assistance
- Take samples (plant, soil)
- Don't forget pictures

Most Common Diseases of 2009

Ornamentals

- **Phytophthora Root and Crown Rot**
 - Boxwood, Juniper, Hydrangea, Leyland Cypress, Pansy, Petunia,
- **Fungal Leaf Spots** (Oak Leaf Blister, Anthracnose, and other leaf spots)
- **Armillaria Root Rot**
 - Oakleaf Hydrangea, Cotoneaster
- **Pythium Root Rot**
 - Pansy and other flowers
- **Powdery Mildew**
 - Dogwood, Crape Myrtle, Rose
- **Botryosphaeria Canker / Dieback**
 - Leyland Cypress, Japanese Maple, Cleyera
- **Bacterial Leaf Spots**
 - Basil, Begonia, Oakleaf Hydrangea, English Ivy
- **Azalea Leaf Gall**
- **Sooty Mold**
 - Various Trees and Shrubs (Hackberry Woolly Aphid)