TREE DISEASES –
DIAGNOSING CURRENT PROBLEMS

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Goals For This Talk

- Go through the basic steps in diagnosing tree problems
- Look at some examples of common and not so common diseases
- Learn what sort of sample would be needed for a diagnostic clinic
Why do we diagnose problems?

1. Accurate diagnosis of plant problems is necessary for effective management.

2. Improper diagnosis may lead to wasted time and money, and the problem will continue.
STEPS FOR DIAGNOSING PLANT PROBLEMS

PUTTING THE PIECES OF THE PUZZLE TOGETHER

1. Identify the plant and know its characteristics
2. Examine the entire plant
3. Assess the area it is growing in
4. Get background info
5. Research possibilities
6. Know when to seek help
7. Expect not to always get an answer.
1. Identify the plant and know its characteristics.

- What is healthy?

- What problems are possible or likely?
  
  - For example, diseases and insects tend to be host specific
2. Examine the entire plant

- Examine the entire plant
  - Leaves
  - Flowers/fruits
  - Branches
  - Stem/trunk
  - Roots
  - Internal tissues
Interveinal chlorosis
Leaf chlorosis isolated on a branch
Leaf chlorosis on whole tree
Shelf mushroom on the side of a tree
Vascular streaking
Planted too deeply
Planted too deeply
Girdling roots
3. Assess the entire area

- Are other plants affected?
- What patterns can you see?
- What plants are nearby?
- Any concrete or buildings nearby?
- What’s the soil and drainage like?
4. Background information: What has happened that might have impacted tree health?

- How old is the plant? When was it planted? Where did it come from?
- What was in the area before the plant?
- What’s happened in the area in the last 10 years? Any construction or grade changes?
- Is this the first victim?
5. Do your bookwork

- What are common problems of this kind of plant?
- What possible suspects are there?
- Can we rule out any possibilities? Is there more evidence we need to collect?
I start with www.google.com

Try several queries:
- Spruce diseases
- Spruce problems
- Spruce brown needles

Choose university extension sites if available, from states near Iowa
6. Know when to get outside help

- NPDN Plant Diagnostic Clinics
  - University of Illinois Plant Clinic (May 1 – Sept 15)
    (217) 333-0519
  - University of Wisconsin Plant Disease Diagnostic Clinic
    (608) 262-2863
  - University of Minnesota Plant Disease Clinic
    (612)625-1275
  - Iowa State University Plant & Insect Diagnostic Clinic
    (515)294-0581
What if you can’t figure it out?
- Some diagnoses are complicated
- There is value in ruling out possibilities
- Wait and see; maybe you’ll get more clues
TOOLS FOR DIAGNOSING TREE PROBLEMS

- shovel, small garden digger
- binoculars, hand lens, camera
- permanent markers, tags, labels, vials
- plastic bags, hand clippers, loppers
- saw, pole pruner, hatchet
- soil sampler, gloves, metal probe
- hammer, notepad, etc.
Leaf diseases

- Physical sample needed to diagnose leaf diseases
- Send 10-20 leaves.
Anthracnose

- Sycamore, maple, oak, walnut, ash, etc.
- Tiny lesions or blotches on leaves, scorched appearance
- Some tree species (e.g., sycamore) – cankers on twigs, shoots, petioles and buds
- Defoliation weakens trees.

Ash  Walnut  Maple
Anthracnose

- Weather conditions: cool and moist
- Subsides with onset of warmer temperatures
- Fungi overwinter on infected debris, infected buds, cankered twigs.
A newly recognized disease of bur oaks
Symptoms

- Appear in late summer to fall
- V-shaped brown areas on leaves
- Browning of leaf veins
BOB Management

- Reduce stress on affected bur oaks:
  - Mulching with wood chips
  - Watering during dry periods
- Propiconazol injections for high value trees
  - Late May early June
  - Phytotoxicity problems
  - Consider reducing rate
Leaf Blister Diseases

- Oak leaf blister
- Maple leaf blister
- Common after rainy periods in early spring
- More common in 2009 than for decades
- No management needed
Oak Leaf Blister

- Caused by *Taphrina* species (fungus)
Maple Leaf Blister

- Caused by a different *Taphrina* species
Galls

- Can often diagnose from an image
Crown Gall
Rough Oak Bullet Gall
Horned oak gall
Vascular Diseases

- Need branches to diagnose
- Several branches the size of a pencil to \( \frac{1}{2} \) inch in diameter
- Branch pieces should be at least 10-12 inches
- Send leaves as well so we can look at leaf symptoms
Oak Wilt

- Very destructive in Eastern and Central U.S.
- Red oak group more susceptible than white oak group
- Trees in red oak group die 1-4 months after infection
- White oak group
  - Bur oaks die in 1-7 yrs
  - White oaks - up to 20 yrs
Oak Wilt

- Red oak group -
  - Symptoms appear in late spring or early summer
  - Spore mats under bark
  - Leaves discolor, wilt, fall off
  - Streaks in outer sapwood

- White oak group -
  - Symptoms more variable, slower to develop
Oak Wilt

- Insect vectors: picnic beetles (Nitidulids)
  - Attracted to spore mats
  - Fly to wounds on other oak trees, feed on sap
  - Spread fungus up to several hundred feet
Oak Wilt

- Avoid wounding April 1 through July 1
  - Sap flows from wounds
  - Paint wounds made from April 1 to first hard frost
  - 80% of new outbreaks from wounding during construction

- Break root grafts
  - Trenching machines or vibratory plows

- Woodlands: Do nothing
  - Often dies out naturally after local outbreaks
Verticillium Wilt

- Maple, ash, redbud, catalpa, etc.
- June and July:
  - Sudden wilting of leaves on one or several twigs
  - Entire branch or crown eventually wilts.
  - Decline or dieback of new twigs
  - Yellowing foliage
  - Sapwood discoloration
Verticillium Wilt

- Fungus can survive in soil for many years.
- More common on stressed trees
- Management: Remove infected trees.
- Replant with non-host trees
  - Beech, birch, hawthorn, hickory, honey locust, white and bur oak, poplar, sycamore
Dutch Elm Disease
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Pine wilt on Scots pine
(also Austrian pine, rarely white pine)
Pine Wilt Sample

- Ideally pieces of the trunk
- If not possible (tree still standing)
  - 12 inches of the base of 2 bottom branches.
- Send needles as well so we can evaluate for needle diseases
Wood Decay

- Often can only be diagnosed on site
- Pictures can help
- If there is a possibility it is a hazard tree it is best evaluated by a trained arborist
Cankers

- Sample of the branch with the canker
Cytospora canker on spruce
Thousand Cankers Disease

- Insect/fungal disease complex affecting *Juglans* spp.
- Affects many walnut species, particularly black walnut (*Juglans nigra*)
23,000 Beetles

35 beetles / sq. inch
Thousand Cankers

- Do not mail a sample
- Call your diagnostic clinic if you have a walnut in decline and ask what to do.
THANK YOU!

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