Outline

- Leaf Spot Problems of Trees
  - And when they are an issue
- Rhizosphaera Needlecast of Spruce
- Phomopsis Dieback of Spruce
- Botryosphaeria Canker
  - BotBotBotBotBotBotBotBot
- Verticillium Wilt
- Boxwood Problems of 2023

Leaf Spots on trees: Why They (mostly) Don't Matter

- What do leaf (or needle) spots do?
- Damage tissue
- Reduce photosynthetic capability
  - (Produce Food)
- Mar aesthetics
- Possible early leaf drop
- …But they don't kill trees! … usually

Common Leaf Spots

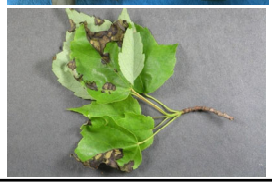
Tubakia Leaf Spot
(and iron chlorosis) - Oak

Tar Spot - Maple

Guignardia Blotch
Horsechestnut
NOT Chestnut or Hickory

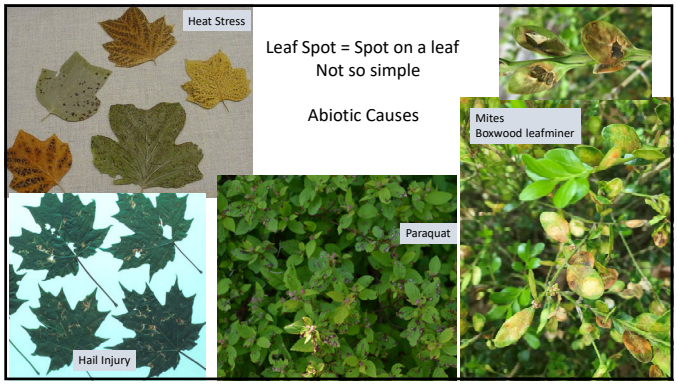
Common Leaf Spots

Taphrina Diseases – Peach leaf curl and Leaf Blister
Peach, Oak, and Maple



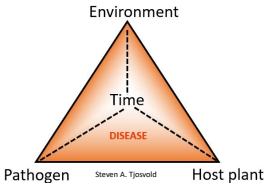
Common Leaf Spots - Anthracnose

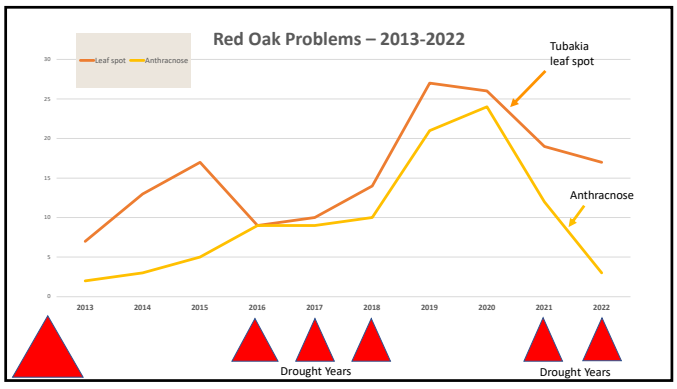
Anthracnose –
Maple, Oak (with iron chlorosis)



When do Leaf Spots Matter?

- Severe leaf spot infections can mean multiple things
  - Highly susceptible host
    - Stressed
  - Conducive environment
    - Rainy, Humid, Overcast, Cool-Warm
  - A virulent pathogen





When do Leaf Spots Matter?

- - An issue when the whole tree is defoliated for successive years or multiple times in a year
- - Or
  - Cause premature needle drop of Conifers
  - Are capable of infecting branches

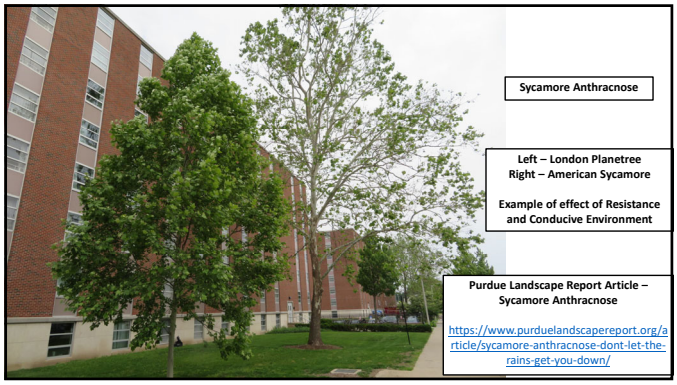
M.A. Hansen – Va Tech

Dogwood anthracnose – *Discula destructiva*

Anthracnose Diseases – Beyond the Leaf Spot

C. Hoysa – VA Coop. Ext.

Sycamore Anthracnose



Sycamore Anthracnose

Left – London Planetree
Right – American Sycamore

Example of effect of Resistance and Conducive Environment

Purdue Landscape Report Article – Sycamore Anthracnose

https://www.purduelandscapereport.org/article/sycamore-anthracnose-dont-let-the-rains-get-you-down/

The trouble with a Blue Spruce is That…

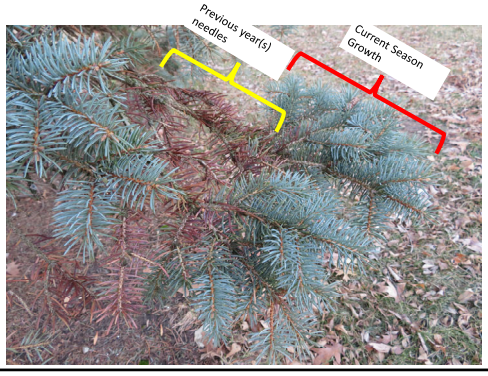
…..it eventually becomes a Rat

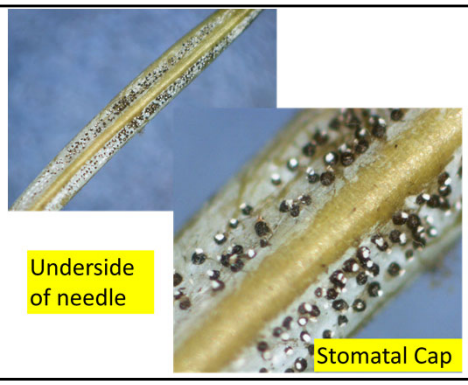
Rhizosphaera Needlecast


Rhizosphaera Needlecast


Symptoms first occur in inner canopy

Moves outward then upward





Rhizosphaera vs. Stigmina:
Dots vs Smudges

Round pycnidia; ooze of spores
Movement dependent on water

Elongate conidiophores
'Feathery' appearance
Not as reliant on water

Rhizosphaera Management

Existing trees:
- Increase air flow
- Remove dead branches and lower whorl of branches
- Manage grass and weeds
- Fungicide applications
  - Chlorothalonil, Copper salts

3 Applications from before budbreak through to Summer

Wet Years are Worse

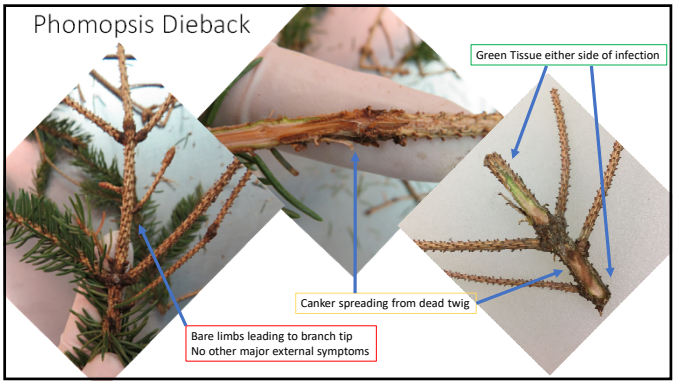
Rhizosphaera Management

Replacing trees or New planting
- Proper plant spacing

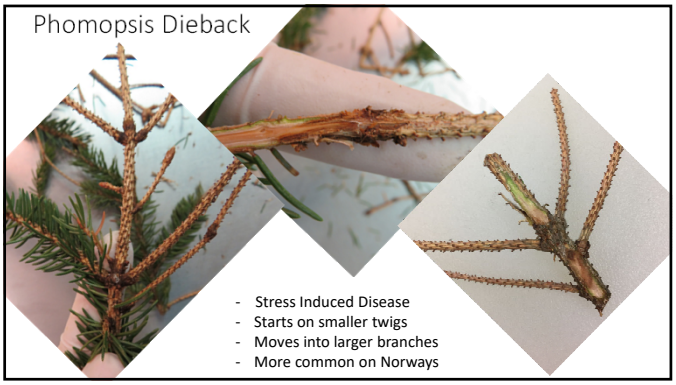
- Plant resistant or tolerant varieties (i.e. 'Fat Albert') or species (P. glauca, P. abies, etc.)

Phomopsis Dieback of Spruce

Phomopsis Dieback



Phomopsis Dieback



- Stress Induced Disease
- Starts on smaller twigs
- Moves into larger branches
- More common on Norways

In severe cases, can look like Cytospora Canker

Non-Cankered – Not Phomopsis

Drought Stress: Green Needles present
Green stem inside

Need to cut into stem for discoloration

Phomopsis twig blight and Canker management

- Mainly on older or stressed landscape trees
- Not only on Norway, but seems to be more common
- More common on trees in part to deeper shade

Phomopsis twig blight and Canker management

- Avoid drought stress
- Manage stress from other diseases
- Prune out affected branches
- Clean pruners
- Currently, fungicides are not effective
- Plant in full sun conditions

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Phomopsis Dieback of Spruce

March 30, 2021 - Included in Issue: 21-04
By: John Bonkowski

We receive a large number of spruce samples each year at the PPDL, with the vast majority being from Colorado blue spruce with needlecast. Many others show lower needle yellowing, which could be associated with nutrient deficiency or root stress. Figure 1 and 2.

Figure 1: A spruce tree suffering from root damage and water stress.

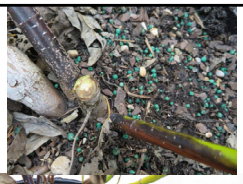
Figure 2: A young spruce tree under the effects of transplant and root stress.

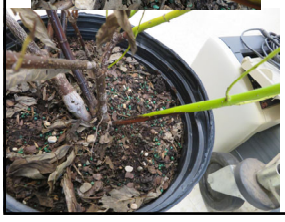
However we are receiving an increasing number of Norway spruce samples with small branch dieback from the tips. This tip dieback symptom can

Botryosphaeria Canker and Dieback

- Wide host range
- Kill bark and tissue below
- Cuts off vascular tissue
- Leads to dieback

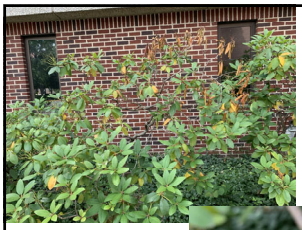
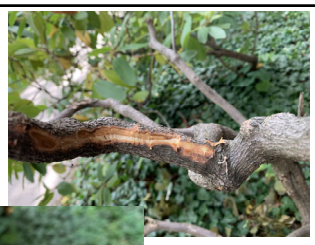
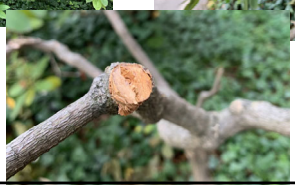
Magnolia





Botryosphaeria Canker and Dieback

Dogwood

Rhododendron

Kermes Scale and Bot Canker

Oak

Botryosphaeria
Canker and Dieback

Kermes Scale and Bot Canker

Botryosphaeria
Canker and Dieback

Botryosphaeria Canker and Dieback

Kermes Scale and Bot Canker

Canker management

- Lots of canker fungi exist
- Management is similar
- Fungicides not recommended

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Opportunistic canker pathogens

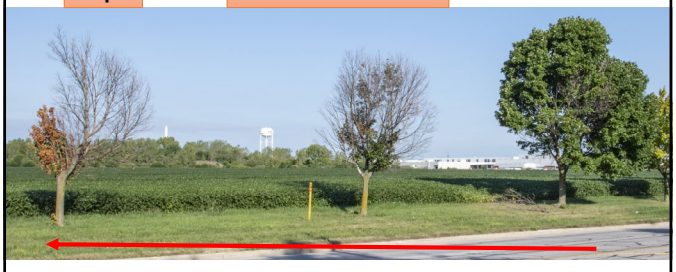
August 14, 2018 • Included in Issue: 18:13
By: Janna Beckerman

Diseases that affect the twigs, branches, and the main trunk of a tree are referred to as cankers or blights. Cankers appear as a general sunken area of darkened tissue on the twigs or branches, often surrounding a branch stub (Fig. 1). Canker diseases can be a serious problem in the landscape when they are not properly managed, and even when they are. All woody plants can be infected by canker pathogens.

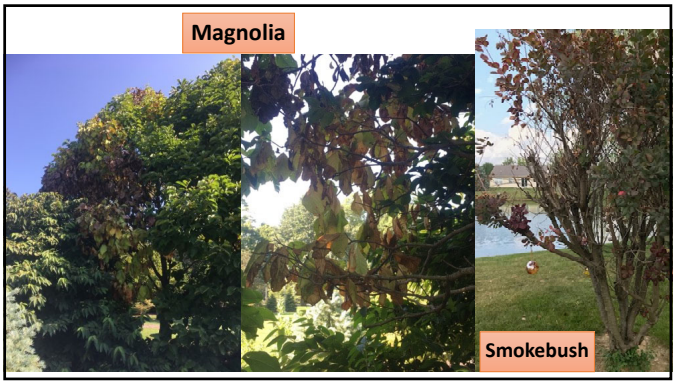
Many canker pathogens produce fruiting bodies, which contain sacs of spores (asci or conidia) that forcibly release the spores when the conditions are right. These pustules are easy to find on the surface of the canker (Figure 2). As the canker grows, the twig or branch may become girdled, causing the wilting and death of the leaves past the point of infection on the tree. On stone fruit, this can cause gummosis, too (Fig. 3).

Figure 1. The branch stub serves as a wound that enables a pathogen, in this case, Nectria spp., to infect. Photo by Janna Beckerman.

Maple — Verticillium Wilt

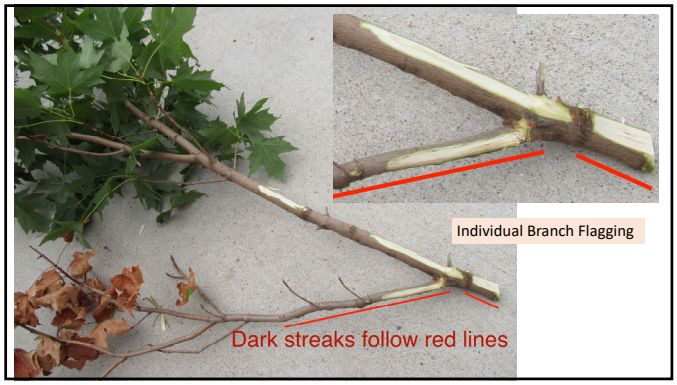


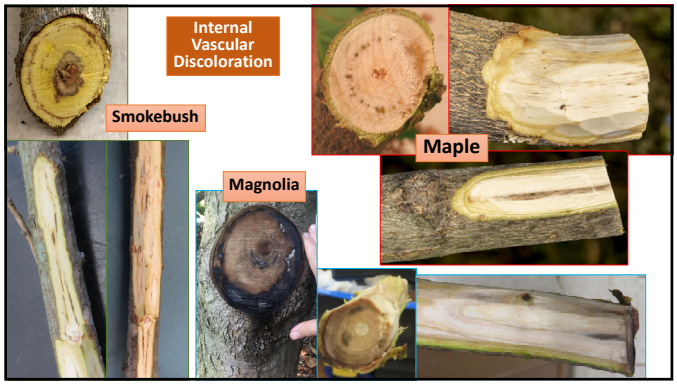
Progressive Disease



Wide host range

Verticillium Susceptible Trees and Shrubs		
Ash	Elm	Sassafras
Azalea	Lilac	Serviceberry
Boxwood	Magnolia	Smoke Tree
Brambles	Maple	Sumac
Buckeye	Ligustrum	Tulip tree
Blackgum	Redbud	Viburnum
Cherry/Plum/Peach	Rose	Yellowwood
Currant	Over 300 total species	





Verticillium Wilt Management

- Soilborne – once present, always present
- Difficult to manage
- Prune out limbs with severe symptoms
- Fertilize with Potassium
- Irrigate during hot/dry periods
- Replant? Use resistant species

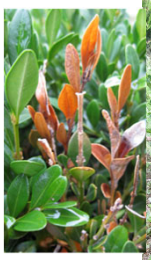
The Boxwood Apocalypse

So cold it kills!

… and it leads to …

Volutella blight

- Infects members of the Buxaceae.
- Infects leaves, stems and stolons.
- Opportunistic blight that infects stressed plants
  - Stresses include high light in summer and winter injury



Note:

Multiple causes of stem dieback on boxwood other than Volutella

- Phytophthora
- Colletotrichum
- Macrophoma
- Boxwood Blight (plus leaf drop)

Volutella Blight

2023– Boxwood Winter Injury and Volutella blight

157 Boxwood Samples with Freeze/frost damage

Cold Injury During a Very Mild Winter?

March 14, 2023 - Included in Issue: 23-02
By: Kim Daniel

Remember the pre-Christmas freeze? What about the extremely long fall? The Midwest experienced above-average temperatures through most of the winter, but those extremely cold temps in late December made for more than a few pipes to freeze in the southern part of the Midwest.

The dichotomy in weather patterns over the last several years has been mind-boggling. We've gone from flooding to drought in most recent growing seasons, to the extremes in temperatures this winter. Though it's an inconvenience for us, plants don't have the option of heated seats or umbrellas, thus stress or death can occur in these extremes.

Figure 1. Accumulated Winter Season Severity Index for winter 2022-2023 in the United States from the Midwest Regional Climate Center. https://mrcc.purdue.edu/research/swssi/indexwssi.jsp

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Boxwood Browning, Blights, and Cankers – 2023 Update

July 25, 2023 - Included in Issue: 23-11
By: John Bonkowski

In the last five years, we have received 233 samples from Indiana, alone, with concerns ranging from boxwood leafminer to Volutella dieback and cold damage (Figure 1, 2, 3). Often, we find multiple problems on any given sample, and very frequently we see *Volutella* in association with dark cankers of stems that appear to have had some amount of cold injury earlier in the season.