

PURDUE
EXTENSION



PLANT AND PEST
DIAGNOSTIC
LABORATORY

Familiar Diseases in the Landscape

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Plant Disease Diagnostician

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)**



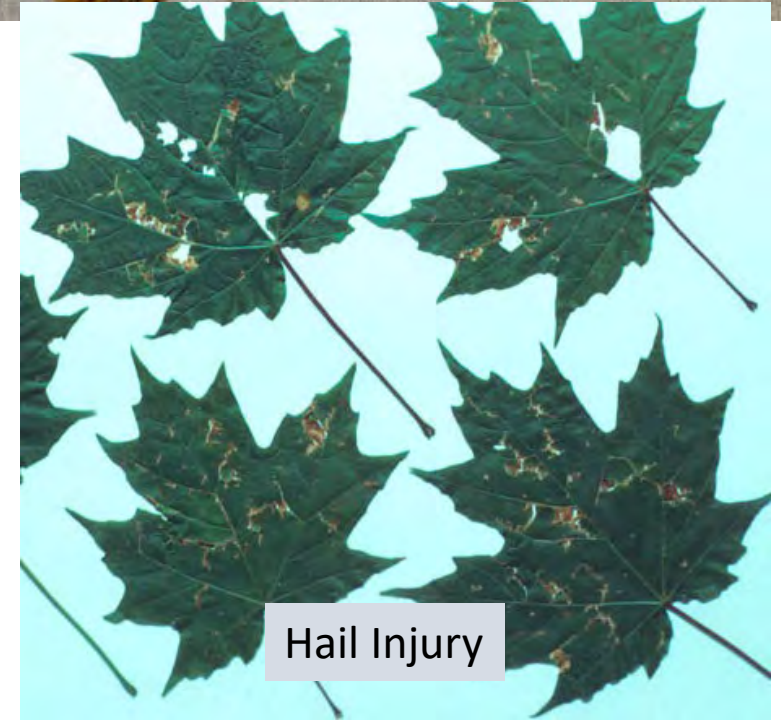
Heat Stress

Leaf Spot = Spot on a leaf
Not so simple

Abiotic Causes



Mites
Boxwood leafminer



Hail Injury

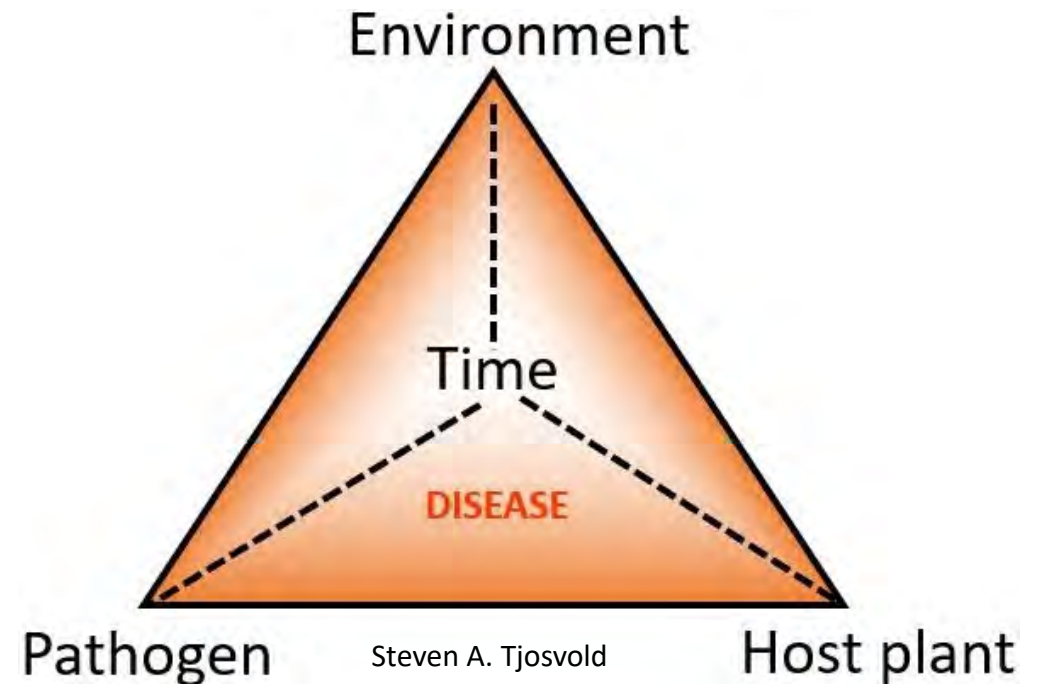


Paraquat

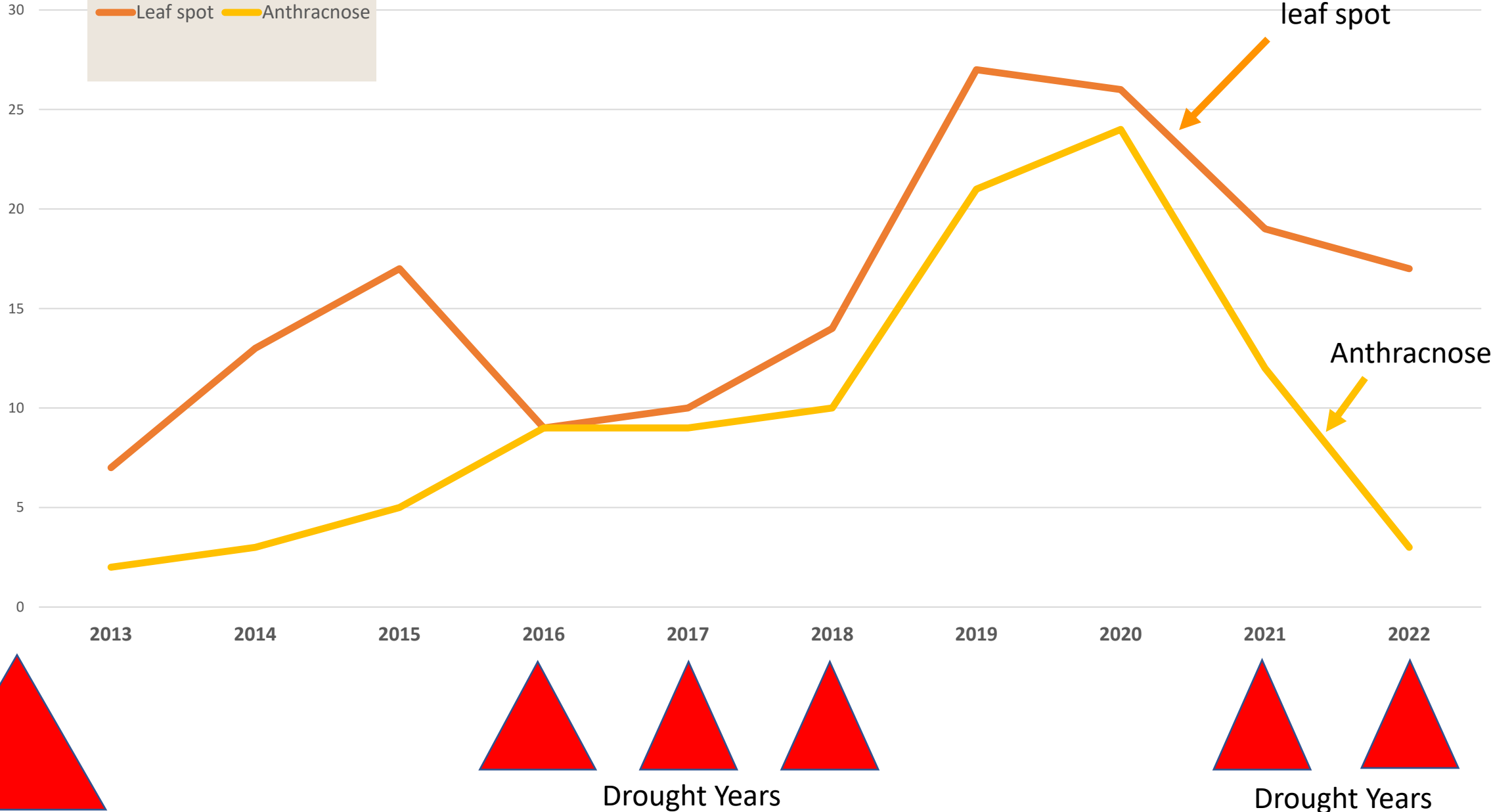


When do Leaf Spots Matter?

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



Red Oak Problems – 2013-2022



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

Anthracnose Diseases – Beyond the Leaf Spot



M.A. Hansen – Va Tech

Dogwood anthracnose –
Discula destructiva



C. Hoysa – VA Coop. Ext.



Sycamore Anthracnose



Spring 2019

Older

Older

2019

Older



Sycamore Anthracnose

**Left – London Planetree
Right – American Sycamore**

**Example of effect of Resistance
and Conducive Environment**

**Purdue Landscape Report Article –
Sycamore Anthracnose**

<https://www.purduelandscape.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





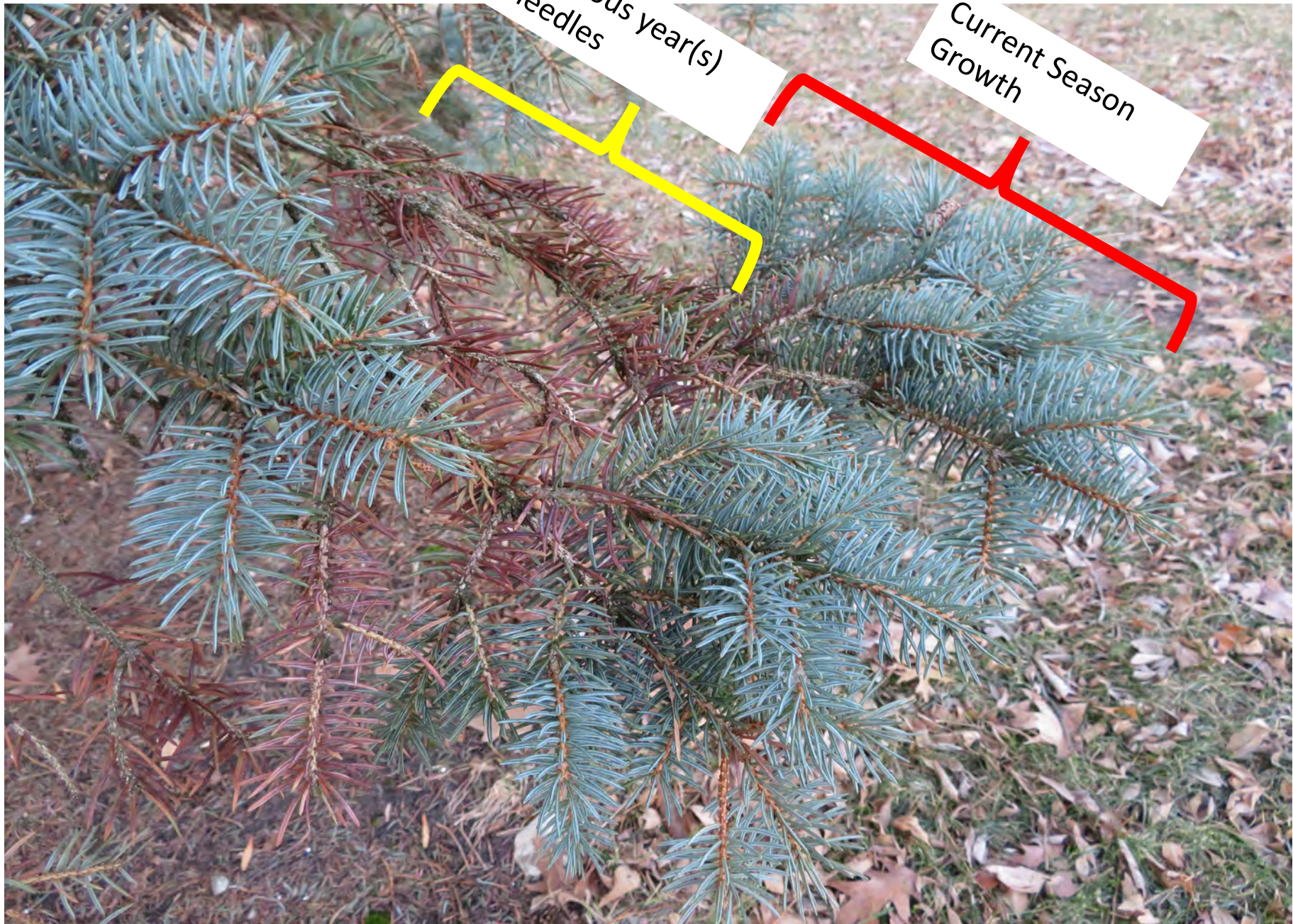
Rhizosphaera Needlecast





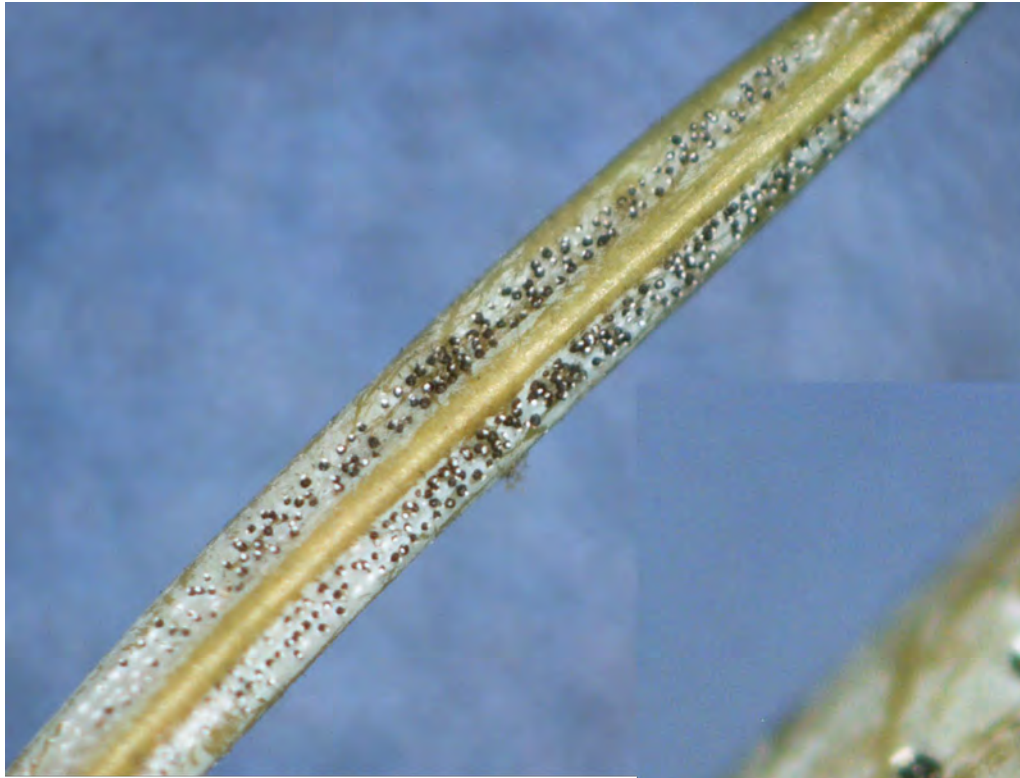
Symptoms first occur
in inner canopy

Moves outward 
then upward 



Previous year(s)
needles

Current Season
Growth



Underside
of needle



Stomatal Cap

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



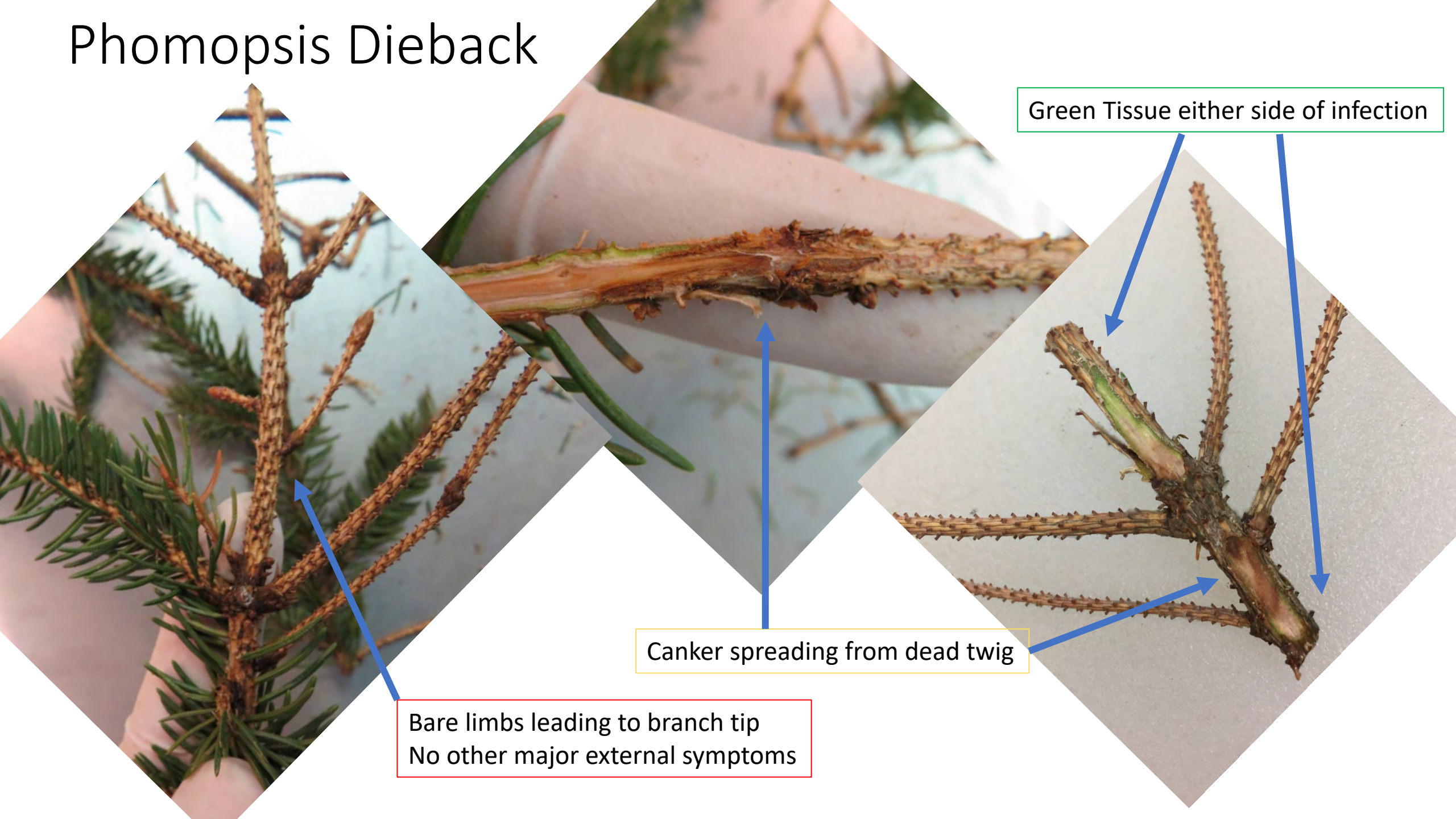
Replacing trees or New planting

- 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



Green Tissue either side of infection

Canker spreading from dead twig

Bare limbs leading to branch tip
No other major external symptoms

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



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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.



Figure 2. The erumpent pimples on the surface are where the perithecia are breaking



Canker management

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

Maple

Verticillium Wilt



Progressive Disease

Magnolia



Smokebush

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	



Marginal Leaf Necrosis



Individual Branch Flagging

Dark streaks follow red lines

**Internal
Vascular
Discoloration**

Smokebush



Maple



Magnolia

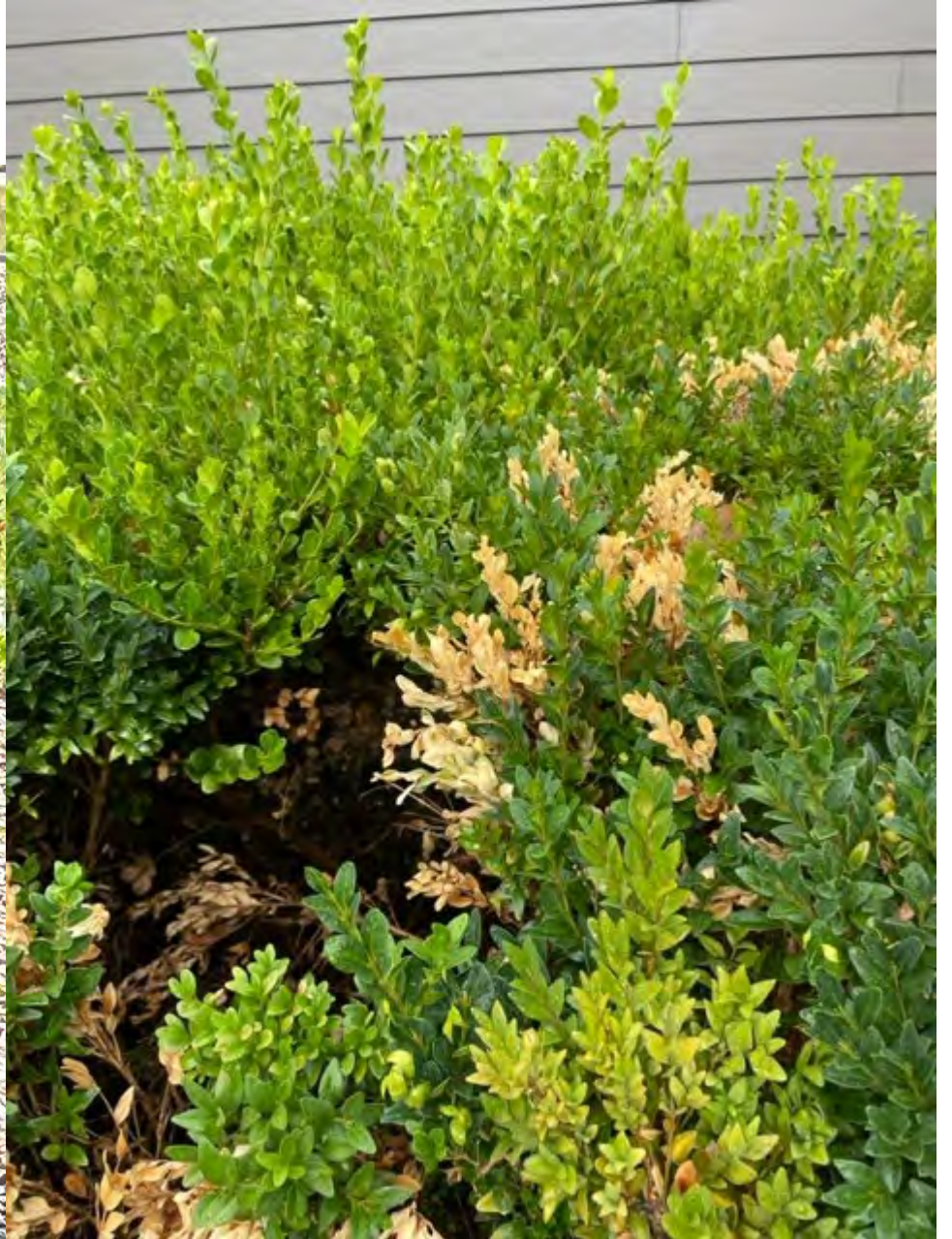


Verticillium Wilt Management

- 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



Volutella Blight



Note:

Multiple causes of stem dieback on boxwood other than

Volutella

- Phytophthora

- Colletotrichum

- Macrophoma

- Boxwood Blight (plus leaf drop)



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: [Kyle 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/awssi/indexAwssi.jsp>



LANDSCAPE REPORT

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.