Conifer Disease Signs and Symptoms

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Managing a problem is much easier when that problem is just beginning.

The farther along a problem becomes, the more extreme the solution may be.

Does your farm have someone designated to conduct pest monitoring?
Diseases we’ll look at today...

- Rhabdocline Needle Cast
- Swiss Needle Cast
- Diplodia Tip Blight
- Rhizosphaera/Stigmina Needle Cast
- Spruce Needle Rust
- Rosellinia Needle Blight
- Brown Spot Needle Blight
Rhabdocline Needle Cast

- Caused by a fungus affecting only Douglas-fir.
- Causes lesions to develop on current season’s needles.
- In spring, spores are released and will grow in the presence of moisture.
- Infection of needles can begin at bud break and continue through needle expansion.
Rhabdocline Needle Cast

- Generally starts on lower branches of tree.
- Yellow defined spotting on current year’s growth first visible in October.
Rhabdocline Life Cycle

Oct Nov Dec Jan Feb Mar Apr May Jun Jul
Rhabdocline Needle Cast

October-November
Rhabdocline Needle Cast

May 6
Rhabdocline Needle Cast

End of June
Detection - Look in areas that remain wet:

- Low lying areas
- Shady areas
- Along tree lines with more mature trees
- Northern exposures
- Around ponds
- Areas with poor weed control
- Tightly spaced trees
Swiss Needle Cast

- Looks like drought stress or winter burn.
- Needles eventually defoliate and leave interior of tree bare.
- Stunted growth.
- Loss of vigor.
- Some growers report almost complete needle loss to young trees and subsequent death.
Symptoms:
- Needle tips of current and/or previous years needles yellow and gradually brown during late winter
- No distinct margin between healthy and infected needle
- Mottled appearance
Fruiting bodies (pseudothecia) develop through stomata on underside of needles.

Fruiting bodies may be detected anytime on:
- any age needle.
- discolored needle
- green needles, even before symptoms develop!

Infected needle may not defoliate for several years.

As long as needle remains attached, it will sporulate in subsequent years.
Swiss Needle Cast
Management:

- Fungicides used for management are *protectants*, so the product needs to be applied to new growth before spores are released to prevent infection.
Management:

- Timing of first application is critical. Carefully scout symptomatic trees in spring for bud break and fungus sporulation (possible with Rhabdocline).

Four fungicide applications *(most commonly Bravo)*

#1 - when 1st trees in plantation break bud.
#2 - one week after first application.
#3 - two weeks after second application.
#4 - three weeks after the third application.

- 4th application necessary only if spring is prolonged by cool, wet weather, or Swiss needle cast is detected.
Revised Chemical Control of Douglas-fir needle cast:

- In cases where disease presence is heavy, five fungicide applications may be necessary*
  
  - #1 - when trees in plantation break bud.
  - #2 through #5
    - 7 – 10 day intervals
    - Carefully monitoring weather conditions
    - Later sprays most important for Swiss

* Paul Shealer, 2014
Douglas-fir Needle Cast Control Tips

- Plant coastal varieties - Shuswap
- Weed control for good lower branch coverage
- Removal of old/overgrown trees
- May take 2 - 4 years to “clean up a tree”

Good timing
- Monitor for bud break
- Weather conditions (prior to wetting)

- Right product
- Thorough coverage
Diplodia (Sphaeropsis) Tip Blight

- Disease infecting a season’s new shoots
- Infection begins in spring and continues to spread throughout the season.
- Spread in wet weather
Diplodia Tip Blight

- **Hosts:** Austrian and Scotch pines (Damage potential severe), Douglas-fir

- **Symptoms:** browning of twigs starting at bud, wilting of new growth, black fruiting bodies found under bark
Diplodia Tip Blight
**Diplodia Tip Blight**

**Management:**
- For light infestations, prune out damage. Be careful not to use the same pruners to clip healthy twigs.
- For heavier infestation, make a few applications of fungicide beginning at bud break. Bravo (chlorothalonil) is not effective against Diplodia.
  - Heritage, Quadrid (azoxystrobin)
  - Topsin (thiophanate-methyl)
  - Kocide, Champ (copper hydroxide)
Rhizosphaera Needle Cast

- Disease of Colorado blue spruce, Englemann spruce and occasionally white spruce.
- Previous years infected needles are cast during summer.
Stigmina Needle Cast

- Disease of Colorado blue spruce, Serbian spruce, black and white spruce.
- Symptoms very similar to Rhizosphaera needle cast.
**Needle Casts of Spruce**

- Usually starts in lower branches of the tree.
- New growth can be infected in spring (May – June) and may develop yellowing symptoms by late summer.
- A second cycle of infection may occur during the same season in September or October.
Rhizosphaera Life Cycle
Year-old needles turn lavender / brown and have tiny, black fruiting bodies in rows on underside of needles.
Management:

- During infection periods, apply fungicide (chlorothalonil - Bravo) and again 3 weeks later.
Spruce Needle Rust

- From November into spring, telia (spore structures) are orange spots or bands on the needles.
- During bud break, the telia rupture to disperse spores to new growth, where infection will occur.
Spruce Needle Rust

Management:

- Scout for symptomatic needles prior to bud break
- Remove heavily infested trees
- Apply chlorothalonil (Bravo) at 10% bud break.
  - Make a 2nd application 1 week later.
  - Make a 3rd application 3 weeks after the first.
Rosellinia Needle Blight

- Found during cool wet springs
- **Hosts include:**
  - Colorado blue spruce and other spruce species
  - Douglas-fir
  - True firs
  - Hemlock
- **Caused by the fungus** _Rosellinia herpotrichoides_
- Develops mat of fine gray mycelium (web-like fibers) over interior foliage.
- Infected needles brown and can be cast
- **Damage potential:**
  - High in seedling beds in cool, moist areas
  - Moderate in mature trees
Rosellinia Needle Blight

Management:

- Remove heavily infested limbs or trees to increase air circulation and reduce humidity in dense plantings.
Brown Spot Needle Blight

- Occurs on *Pinus* spp.
- Most common on Scotch Pine; can occur on Eastern white pine.
- Very similar to Red-Band Needle Blight or Dothistroma.
- Distribution – worldwide.
- High damage potential.
Infection begins on lower limbs of tree.

Infected needles brown from the tips down.

Small spots form on the needles in August which are yellow first, then light brown with chestnut-brown borders.

Base of needle may remain green.

Sporulation occurs during late spring/early summer.
Brown Spot Needle Blight

Management:

- If control action is necessary, fungicide spray can be applied when new needles are half grown. For severely infested trees, a second application can be made 3-4 weeks later.
PA IPM’s manual – *IPM For Christmas Tree Production*

- 200+ pages with over 400 color photos
- 44 full-color pest and disease fact sheets with practical identification and control information

**Two ways to access:**

- **Purchase** ($40 + taxes/fees)
  - Mail in order form
  - Through PSU Publications website: [http://pubs.cas.psu.edu/](http://pubs.cas.psu.edu/)
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QUESTIONS???