Needle Blight
*Mycosphaerella gibsonii*

Photo: H. Hashimoto, Bugwood.org # 1949016
**Needle Blight**

- Fungal pathogen
- First recorded in Japan in 1913
- Serious disease of exotic and native trees in *Pinus* spp.
- Mostly affects seedlings and saplings
- Under epidemic conditions, may cause 100% infection rates and 50-80% death rates
- Disease severity influenced by:
  - Species infected, age of tree infected, environmental conditions

Photo: H. Hashimoto, Bugwood.org # 1949016

Needle blight symptoms on *Pinus thunbergii*. 
Host Plants

• Numerous species of *Pinus* trees including:
  – Rocky Mountain bristle cone pine
  – shortleaf pine
  – lodgepole pine
  – slash pine
  – ponderosa pine
  – white pine
  – loblolly pine

• Under laboratory conditions, other conifers are susceptible

• Resistance to the disease reported in a few *Pinus* spp.
Potential Distribution
Risk Map (2011)

Map courtesy of www.nappfast.org – accessed 11/12/2013
Disease Symptoms

- Appear within 2 to 5 weeks of infection on lower needles
- Lesions that are 5–10 mm long
  - initially light, yellow-green bands; fade to gray-brown
  - no reddish tint
- Dark fruiting bodies on lesions.
- Host loses leaves, has stunted growth, and may die
Identification

Fungal species can be distinguished by examining conidia - asexual non-motile spores of a fungus.

Conidia of *Mycosphaerella* sp.

Photo: William Jacobi, Colorado State University, Bugwood.org, #5366775
Spread and Transmission

- Pathogen spreads on infected nursery stock
- Hyphae can overwinter in affected needles or as a latent infection on healthy-looking needles
- Spores dispersed by rain splash or overhead irrigation
- 2 to 3 days of moist, humid conditions required for fungal dispersal and infection
Monitoring and Management

- **Monitoring**
  - conduct a survey for visual symptoms and collect blighted needles

- **Chemical control**
  - in nurseries, use manebo (or mancozeb) or copper-based fungicides

- **Cultural control**
  - all diseased seedlings should be removed and burned early in the season
Look-alike Species

Dothistroma blight (*Mycosphaerella pini*)

Note – Needles infected by *M. gibsonii* do not have a reddish tint as with other pine diseases.

*M. pini* symptoms on *Pinus ponderosa*.

Photos: (Left) Robert L. James, USDA Forest Service, Bugwood.org #1241609; (Right) Susan K. Hagle, USDA Forest Service, Bugwood.org #1241610
Look-alike Species
Diplodia blight (*Sphaeropsis sapinea*)

*S. sapinea* symptoms on *Pinus ponderosa*.

Note - Needles infected by *M. gibsonii* do not have a reddish tint as with other pine diseases.

Photos: (Left) Joseph O’Brien, USDA Forest Service, Bugwood.org #5029014; (Right) Susan K. Hagle, USDA Forest Service, Bugwood.org #1241526
Look-alike Species
Brown Spot Needle Blight (*Mycosphaerella dearnsesii*)

*M. dearnssii* symptoms on *Pinus palustris* (longleaf pine)

*M. dearnssii* symptoms on *Pinus sylvestris* L. (Scots pine)

Photos: (Left) - David J. Moorhead, University of Georgia, Bugwood.org, #0908075; (Right) - Darroll D. Skilling, USDA Forest Service, Bugwood.org, #1949034
Look-alike Species

Pine Needle Rust (*Coleosporium asterum*)

*Above:* *C. Asterum* symptoms on red pine. Below: fruiting bodies (aecia) on pine host.

*Photos: (Left) USDA Forest Service - North Central Research Station Archive, USDA Forest Service, Bugwood.org, #1406007; (Right top) Susan K. Hagle, USDA Forest Service, Bugwood.org #1241526; (Right bottom) - USDA Forest Service - North Central Research Station Archive, USDA Forest Service, Bugwood.org, #1406003*

*C. Asterum* symptoms on *Pinus resinosa* (red pine)
Look-alike Species
Needle Cast (*Ploioderma* and *Lophodermium* spp.)

- Lodgepole pine needle cast symptoms (above);
- Immature fruiting bodies of *Ploioderma* spp. on *Pinus nigra* Arnold (below)

Photos: (Left) – David J. Moorhead, University of Georgia, Bugwood.org, #0485002; (Top Right) – USDA Forest Service Archive, USDA Forest Service, Bugwood.org, #1241614; (Bottom right) - Sandra Jensen, Cornell University, Bugwood.org, #5492330

Ploioderma needle cast symptoms on *Pinus virginiana* (Virginia pine)
Look-alike Species

Pitch Canker Disease (*Fusarium circinatum*)

Pitch canker symptoms on *Pinus elliottii* Englem (slash pine)

Longleaf pine with pitch canker, note resin soaked wood & resin on stem

Slash pines showing resin on outside of stem

Photos: (Left) – Terry S. Price, Georgia Forestry Commission, Bugwood.org, #1247233; (Middle) – Jason Smith, University of Florida; (Right) – Tyler Dreaden, University of Florida
Authors

Annika Minott
Graduate Research Assistant, Doctor of Plant Medicine Program, University of Florida

Smriti Bhotika, Ph.D.
Postdoctoral Associate, Department of Entomology and Nematology, University of Florida
Editors

Stephanie Stocks, M.S.
Assistant-Inf, Extension Scientist, Department of Entomology and Nematology, University of Florida

Matthew D. Smith, Ph.D.
Postdoctoral Associate, Department of Entomology and Nematology, University of Florida
Reviewers

Jeff Eickwort, B.S.
Forest Biologist, Florida Department of Agriculture and Consumer Services, Florida Forest Service

Jason Smith, Ph.D.
School of Forest Resources and Conservation, University of Florida

Aaron Palmateer, Ph.D.
Associate Professor, Tropical Research and Education Center
Collaborating Agencies

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References


  – http://caps.ceris.purdue.edu/webfm_send/586


  – https://edis.ifas.ufl.edu/fr298#FIGURE 2
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