Red Pine Regeneration

Forest Health Issues

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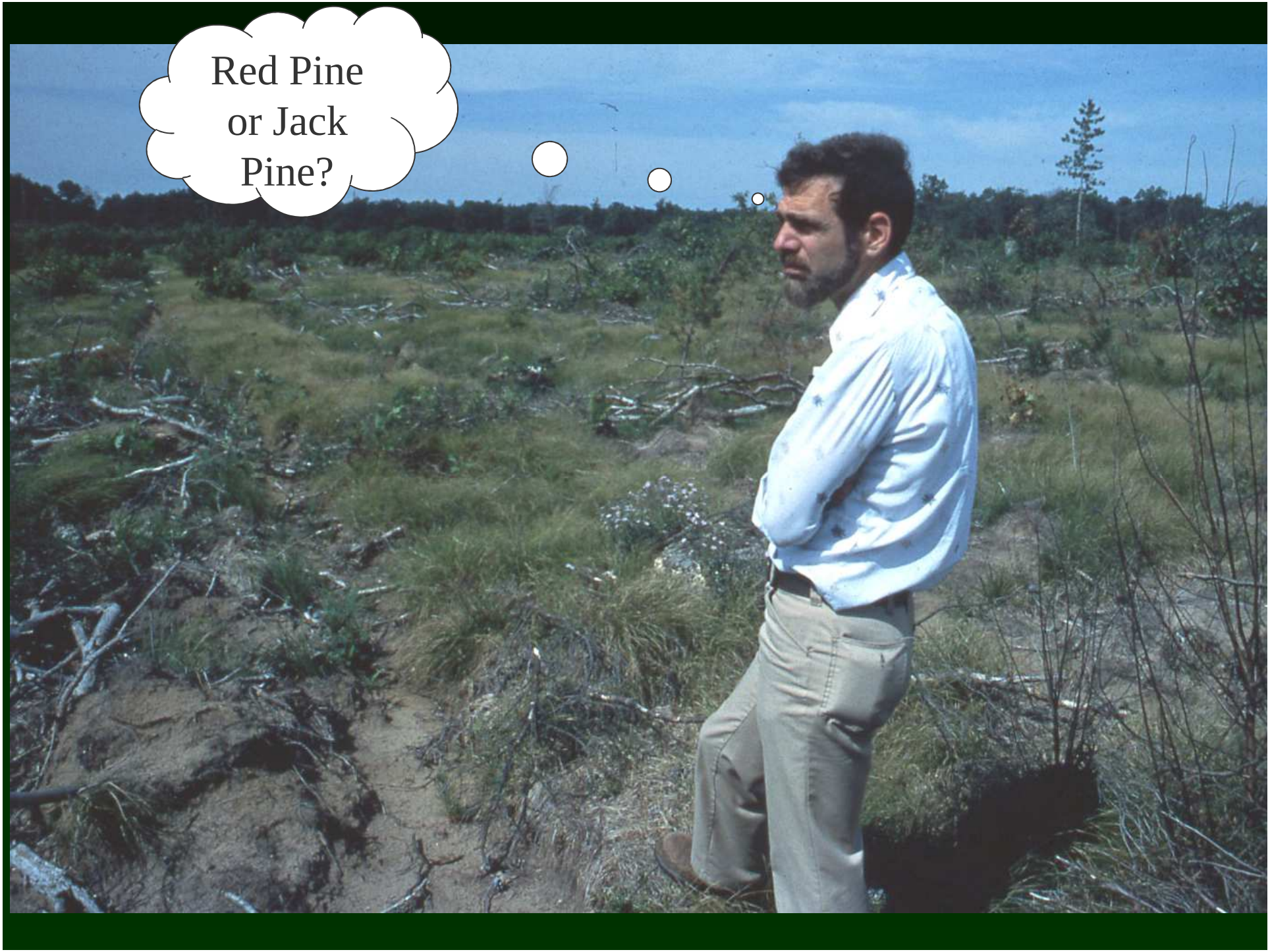

Red Pine
or Jack
Pine?

Start with the site

Site index is used to estimate productivity of the site, but the productivity of the stand depends not only on the site but how well it is used (Benzie, 1977).

- Problem rows (hand planting)
- Root injury from planting (Armillaria)
- Diplodia/ Lophodermium from nursery
- Transport and handling of seedlings
- Site Problems
  - Competition
  - Pests

Root /Root Collar

- White Grubs
- Pine Root Collar Weevil
- Armillaria Root Rot
  - ✓ J-rooting
  - ✓ Root injuries

White Grubs

White Grubs

- Most conifers
- C-shaped grubs in soil
- Growth Loss
- Dead seedlings

Pine Root Collar Weevil

- Scotch, Austrian, white and red pines
- Off-color foliage
- Resin-soaked root collar and soil
- Grub-like larvae in soil

Pine Root Collar Weevil

Armillaria spp.

- A “humongous fungus”
- Attacks stressed trees
- 1000’s of hosts
- Conifers and hardwoods
- Major factor in most tree declines in the Lake States, including birch, oak, spruce, balsam fir
- Kills pines of all ages, from seedlings to over mature trees

“Shoe String Root Rot”

Shoe Strings /Rhizomorphs

Mycelial mats or fans

Armillaria Root Disease

- Attacks trees predisposed by other stressors
  - Drought
  - Light soils

Stem & Shoot

- Spittlebugs
- *Scleroderris* canker/shoot blight
- *Sirococcus* shoot blight
- *Diplodia* (*Sphaeropsis*) shoot blight

Spittlebugs

- Saratoga spittlebug
  - Alternate hosts
  - Growth loss
  - Topkill
  - Symptoms:
    - Flagging
    - Feeding scars
    - Stem deformities

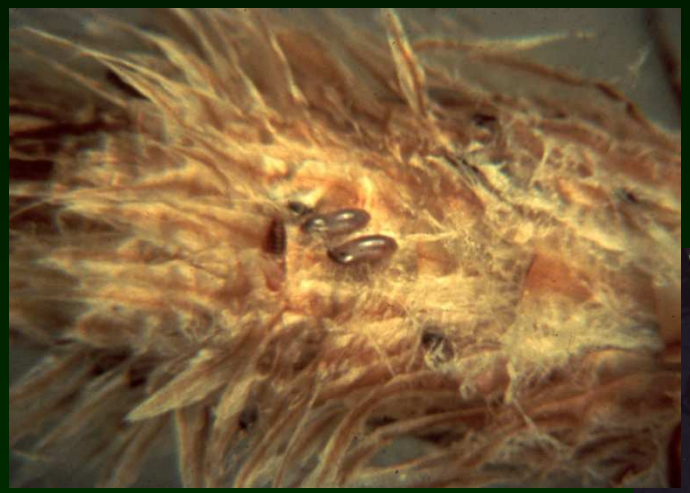
Saratoga Spittlebug

flagging

feeding scars

stem deformities

Saratoga Spittlebug



Stem Impacts

Impacts

Impacts

Scleroderris shoot blight

Caused by *Gremmeniella abietina* (aka *Scleroderris lagerbergii*

Cold-loving fungus, affects red pine

Grows and causes disease under the snow in winter

First symptoms: needles turn red from the base outward

Usually affects only about the bottom 6’ of trees.

Sirococcus Shoot Blight

- Shoot and branch dieback
- Overwinters on needles
- Springtime infection
- Needle droop
- Needles to Shoots to Cankers
- Two-story stands

Sirococcus shoot blight

Caused by *Sirococcus conigenus*

Usually only the current year shoots are affected

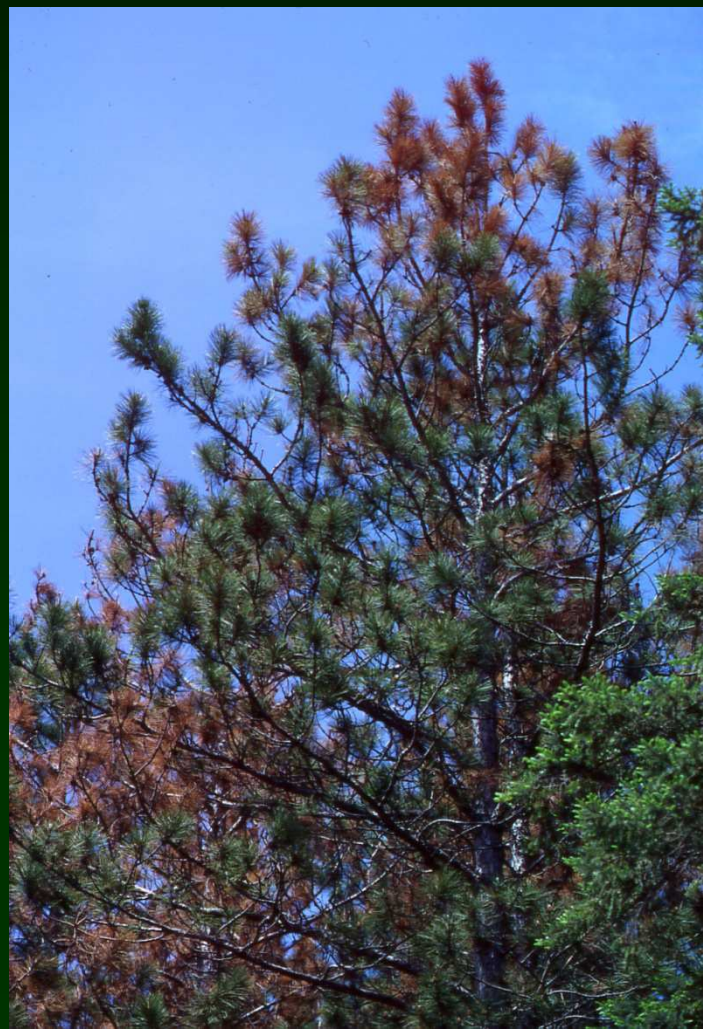
The disease was once known as “deerskin droop,” because it was first found near the Deerskin river in Wisconsin, and *sometimes* has a characteristic drooping symptom.

These trees suffered several years of heavy infection

Diplodia shoot blight

Caused by *Diplodia pinea*, aka
Sphaeropsis sapinea

Not restricted to current year's growth



Also occurs on jack pine, Scots pine, and can be very severe on Austrian pine

Diplodia cankers usually cause a dark stain in the wood where the canker occurs

Diplodia shoot blight is often associated with red pine growing on poor, droughty sites

Diplodia Shoot Blight

- Shoot blight
- Stem canker
- Collar rot
- Stress
- Rain-splashed and windblown
- Red, jack, Scotch, Austrian pines

Wyman Nursery / Baraga Plains

Small black fruting bodies of *Diplodia pinea* occur on needles and cones

Hail wounds often serve as infection courts for *Diplodia*

Hail storms can cause the sudden appearance of shoot blight symptoms

Red pine plantation adjacent to a mature red pine stand

Uneven-age management in red pine

"This path leads to the dark side"

Red pine seed-tree-shelterwood cut on the Huron-Manistee NF

In some stands, 95-99% mortality occurred

Devastated red pine regeneration under red pine shelterwood

Diplodia Shoot Blight

Complicating factors

- *Diplodia pinea & D. scrobiculata*
- *Diplodia* is often present in younger trees as a “latent” infection
- Stress can trigger an epidemic event
- Hail storms can trigger an epidemic event

Foliage Problems

- Conifer Sawflies
  - Late sawflies
  - Early sawflies

Conifer Sawflies

- Colony or single feeders
- Spring versus summer sawflies
- Poor sites/off-site plantings: highest risk
- All pines, spruce, larch

Red-Headed Pine Sawfly

Red-Headed Pine Sawfly

Pine Sawflies

- Poor sites/off-site plantings: highest risk
- Reduce edge
  - Plant in blocks

Webspinning Sawfly

Red pine pocket mortality on H-M NF near Cadillac, MI

Pocket mortality in red pine near Cadillac, MI

Thank you

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