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Forest Biosecurity and Protection

***Nectria* ecology summary
March 2007**



SCION

1. How does the fungus spread and infect the host?
2. How does the host respond to the fungus?

1. Spread and infection: Spore Trapping

- ▶ Is there a correlation between spore release and environmental conditions?

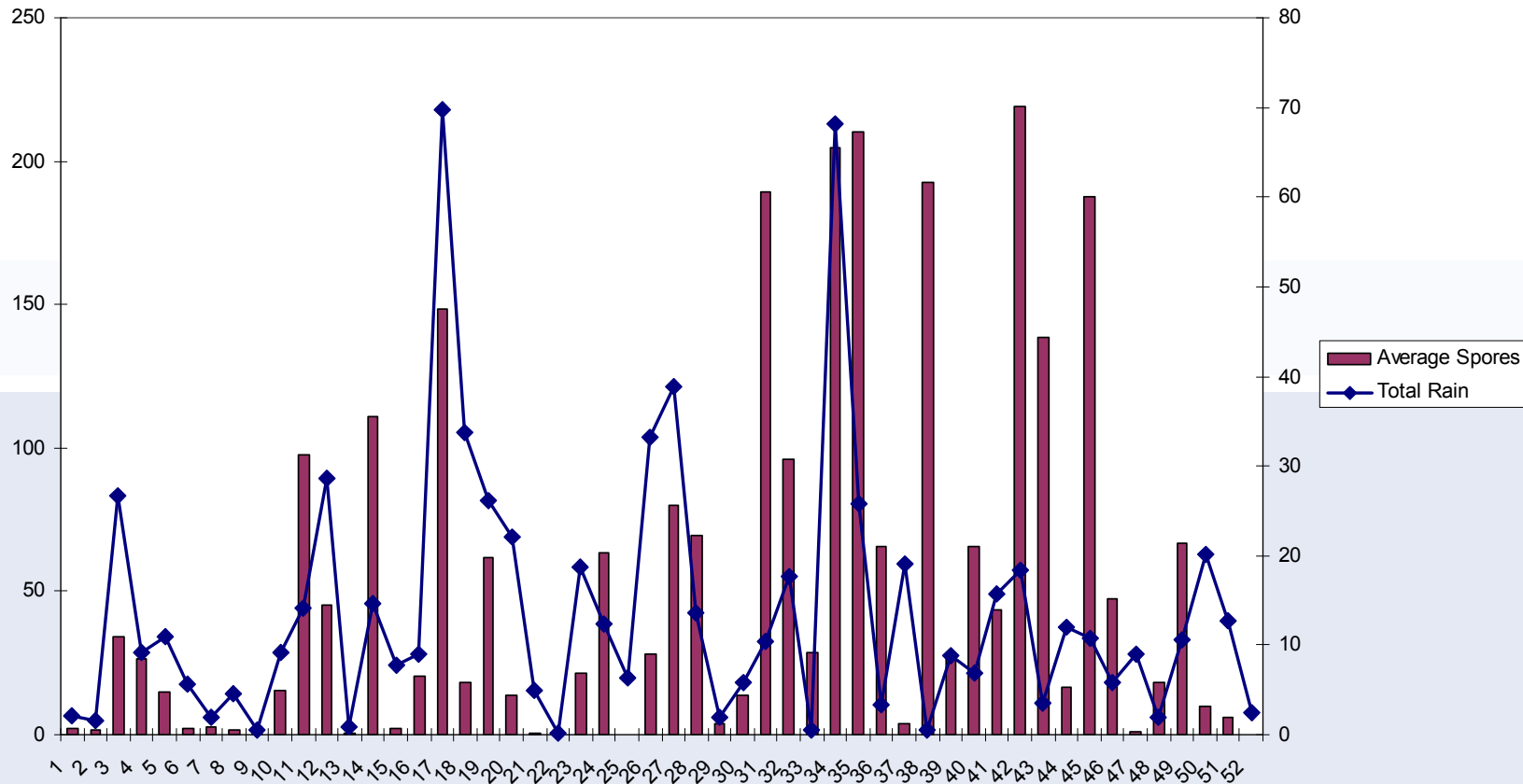


1. Spread and infection: Spore Trapping

- 3 spore traps around each of 2 trees
- Traps changed weekly for one year
- Collected environmental data



1. Spread and infection: Spore Trapping



- Some relationship between rainfall and spore release

1. Spread and Infection: Spore Trapping



- Further investigations:
 - ▶ Ice melt on stems
 - ▶ Temperature
 - ▶ Consecutive rain days

1. Spread and Infection:

Long-term spore viability



- Aim: determine long-term viability of ascospores within perithecia.
- Preliminary trials: May require an overwintering period.
- Methods:
 - ▶ 4 treatments: room temp, 4°C, -18°C, room temp/- 18 °C alternating
 - ▶ 2 wood blocks/treatment
 - ▶ Assessed after 1, 2, 3, 6 and 12 months

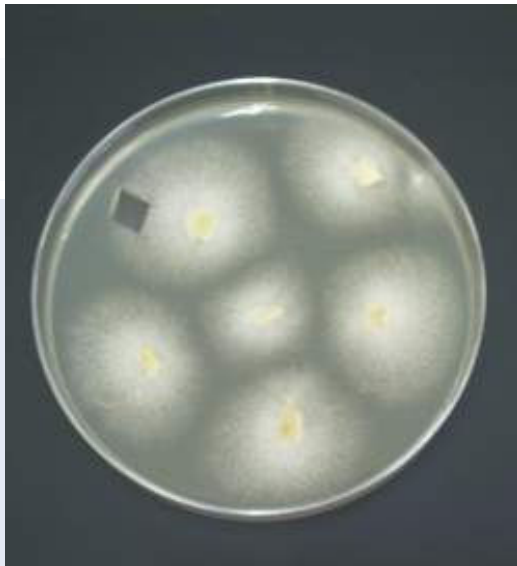
1. Spread and Infection: Development of perithecia



- Aim: determine how long after infection perithecia are produced & how long they remain viable
- Assess inoculation conc. trial monthly - photographs
- Collect data from pruned stub trial, other observations

1. Spread and Infection:

Effect of resin on growth and germination



- Aim: examine the effect of pine resin on mycelium and spores.
- Methods:
 - ▶ Grow *Nectria* on medium containing resin.
 - ▶ Assess spore germination when resin is present.

PROBLEM: Pine resin does not dissolve in water!

1. Spread and Infection: Inoculation Trial



- Pat & Margaret set up in April 2005
- Aim: Determine infection potential of ascospores and conidia
- Methods:
 - ▶ 45 trees
 - ▶ 3 inoculations: water, ascospores, conidia
 - ▶ 3 wound types: shallow, deep, branch

1. Spread and Infection: Inoculation Trial: 2 year results



- Some trees in all treatments showing fluting
- Fluting is usually greater with *Nectria* than water
- Type of wound is most important factor (especially deep wounds)
- Felled 9 trees:
 - ▶ *Nectria* isolated from 2/3 controls.
 - ▶ Will fell rest of the trial to look at infection patterns

1. Spread and Infection:

Mating Study



- Two mating types needed to produce fruitbodies in culture
- How many mating types are there?
- Do you need more than one mating type for fruitbody production in the field?



2. Host Response:

Early disease development and effect on host

Pat: Early infection stages, Nov. 2005

- Inoculated 8 trees
- Harvest 2 trees every 2 months
 - Reisolate fungus
 - Study changes in wood and bark



2. Host Response:

Early disease development and effect on host

Inoculated in August
2006

- Inoculated 8 trees
- Harvest 2 trees every
2 months
 - Reisolate fungus
 - Study changes in
wood and bark



2. Host Response:

Early disease development and effect on host

- Very little fungus isolated from trees or seen under microscope
- Fungus often isolated from controls





- *Nectria* dispersed by water and appears to have some correlation to rainfall patterns
- *Nectria* perithecia are viable all year round



- Ian Simpson, Ensis
- Peter Oliver & Ross Chambers, City Forests
- John Spiers, City Forests
- David Thode, PF Olsen
- Aaron Gunn, Paul Greaves & contractors, Wenita
- David Orlovich, Mary Anne Miller, Otago University