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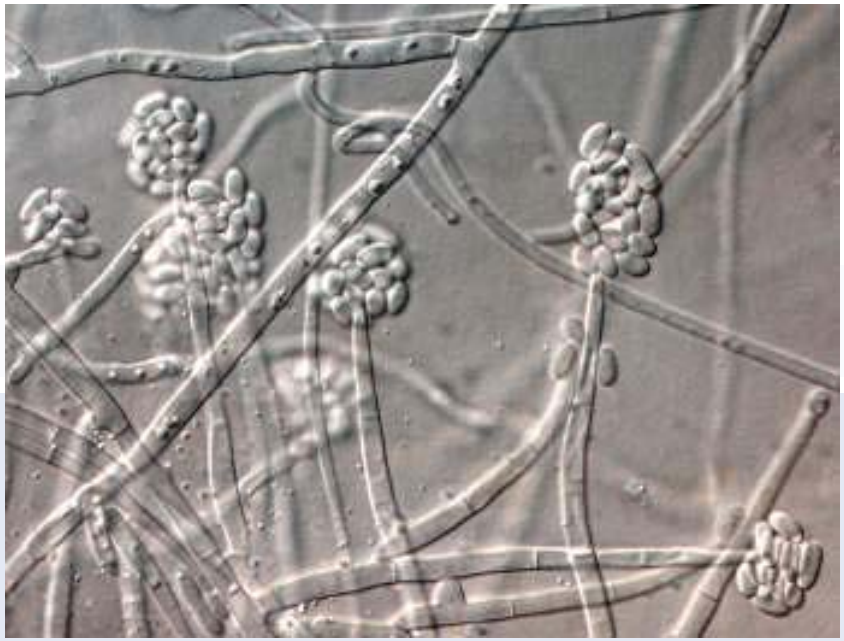
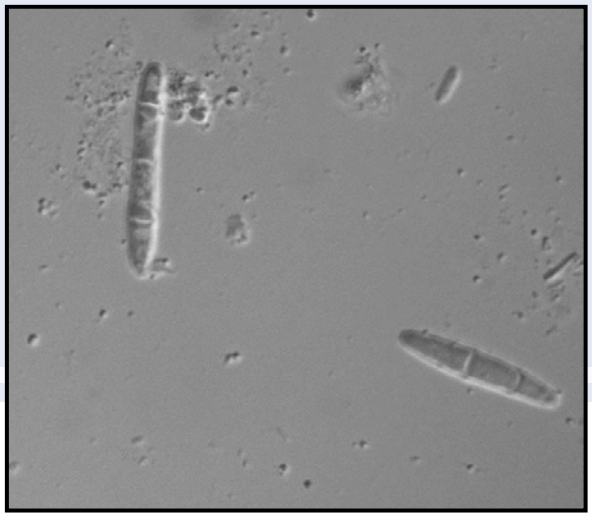
Nectria has 3 different spore states



In culture



In nature, not common

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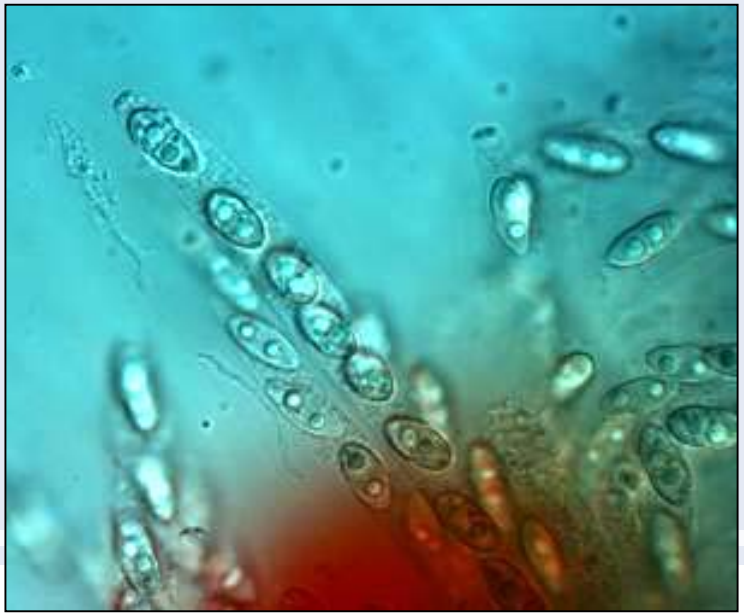

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Spore dispersal ---mainly by water, not wind

- Patchy distribution
- Slow spread

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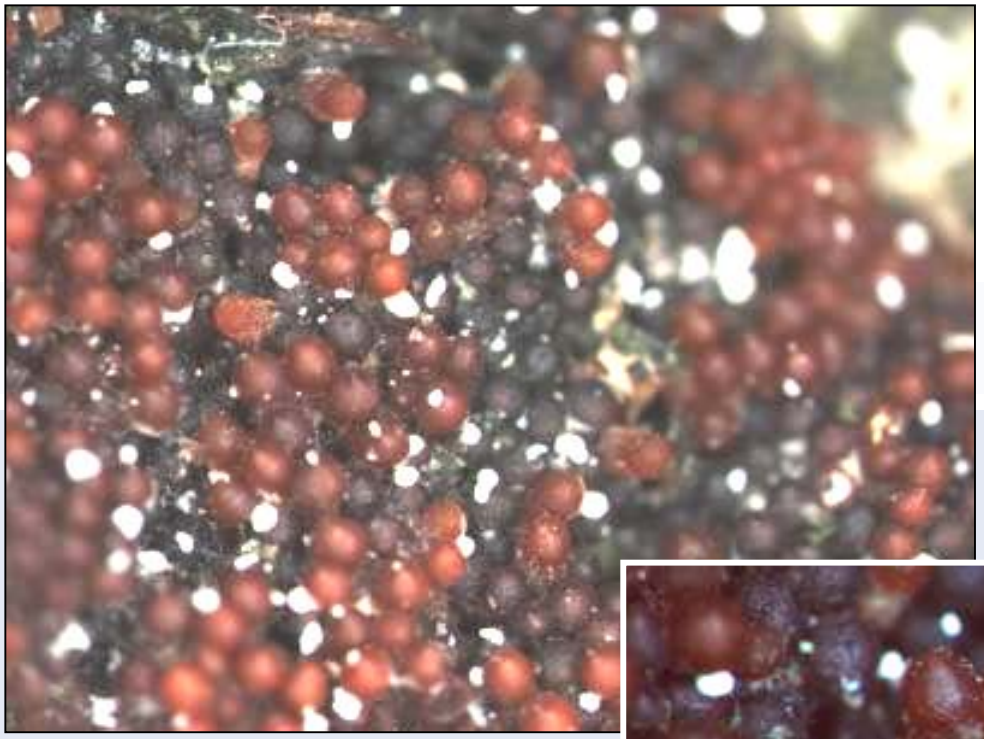
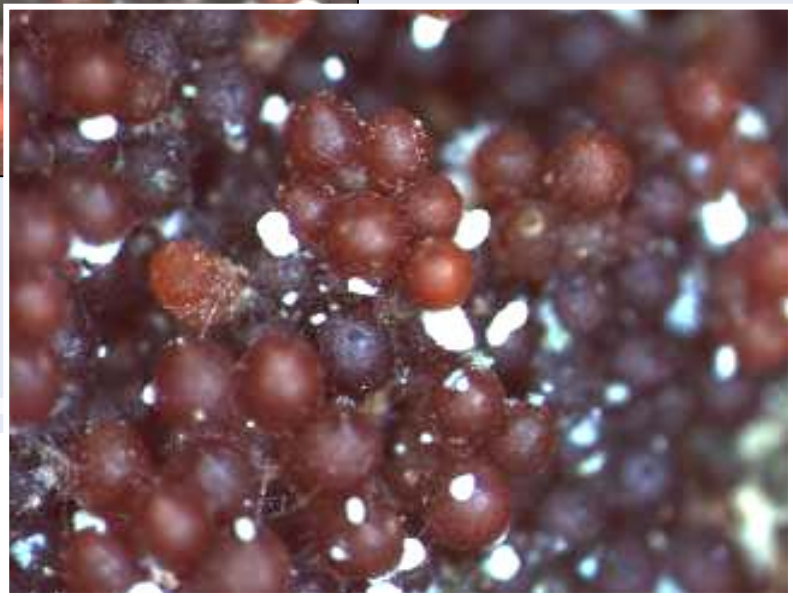
The evidence





- Spores ooze out of fruit bodies when soaked in water or after a rain
- Spores dry in clumps on surface

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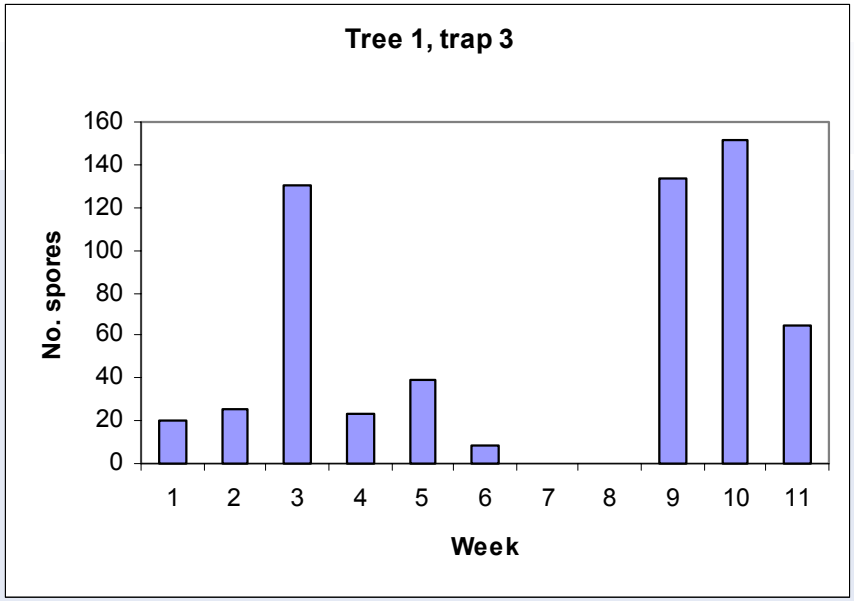
Spore trapping

- To show when dispersal occurs
- The effect of weather on dispersal



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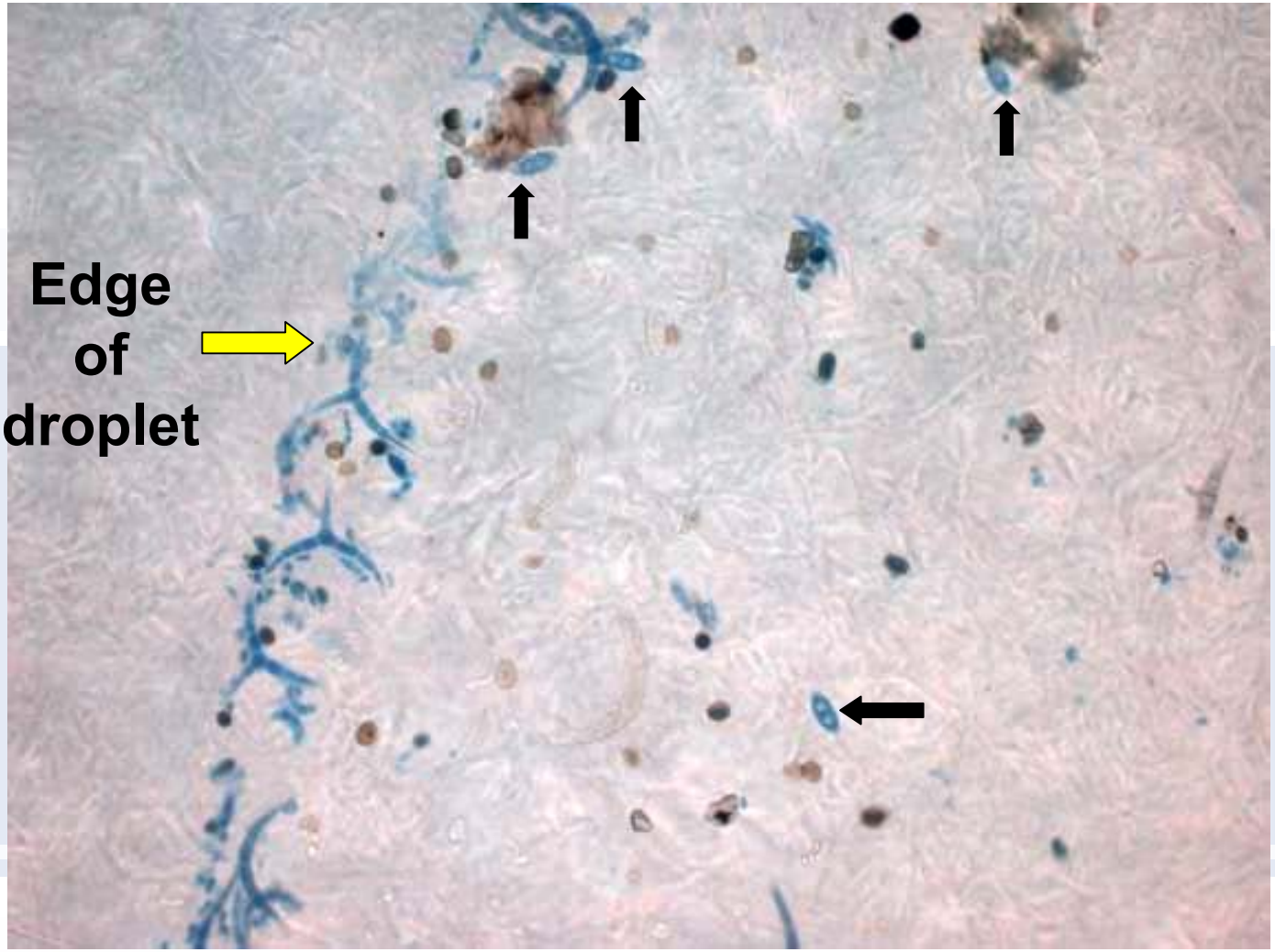
Assessing spore traps



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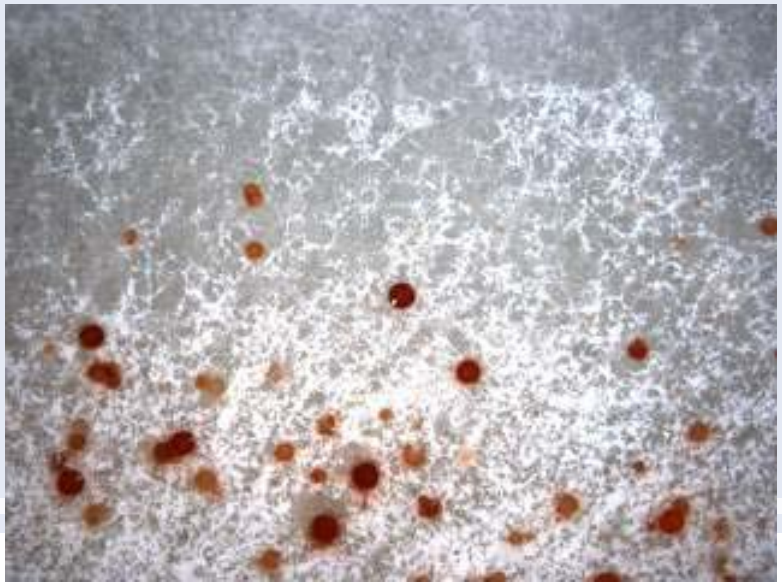
Lab expts. 1. Factors that control fruit body production

- Two compatible mating types are needed
- Suitable nutrient and light conditions



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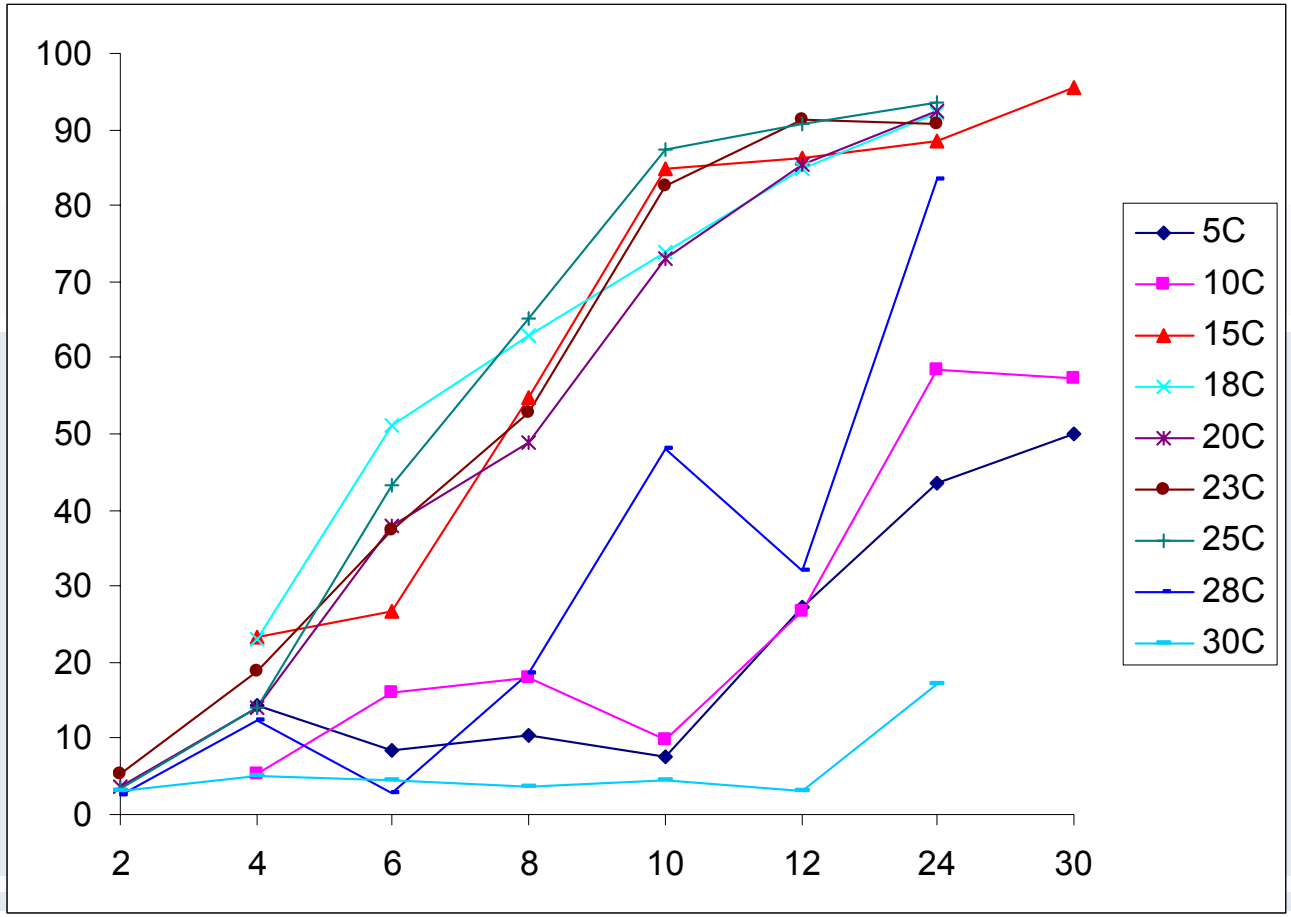
2. Conditions that induce spore germination

Effect of temperature



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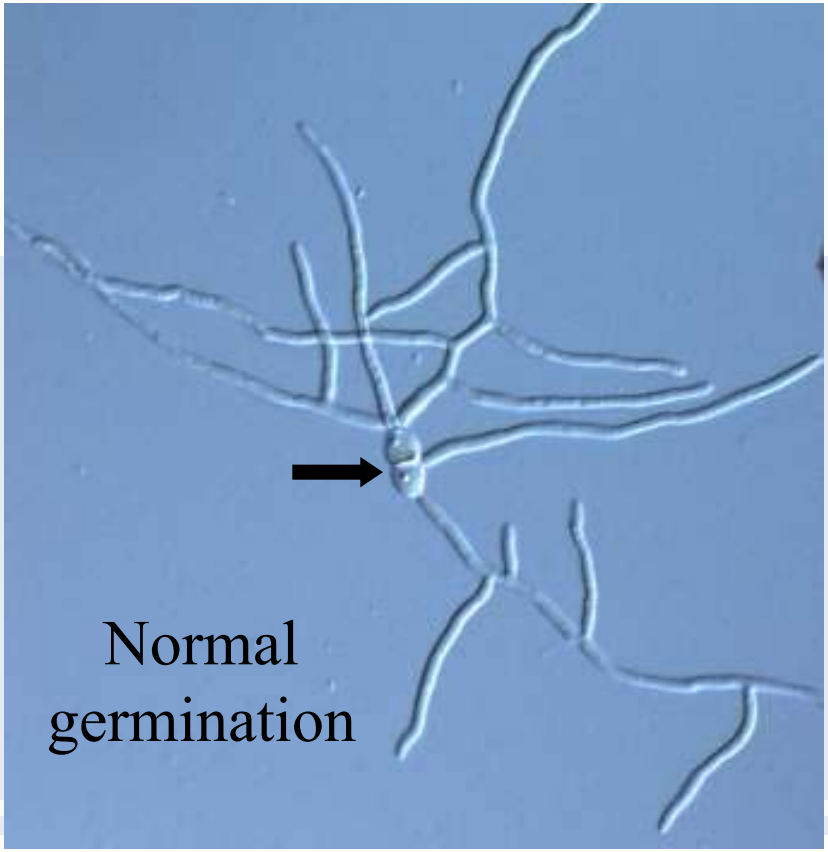
Conditions that induce spore germination

- **Free water is required**



Normal germination

Abnormal germination at 30 C

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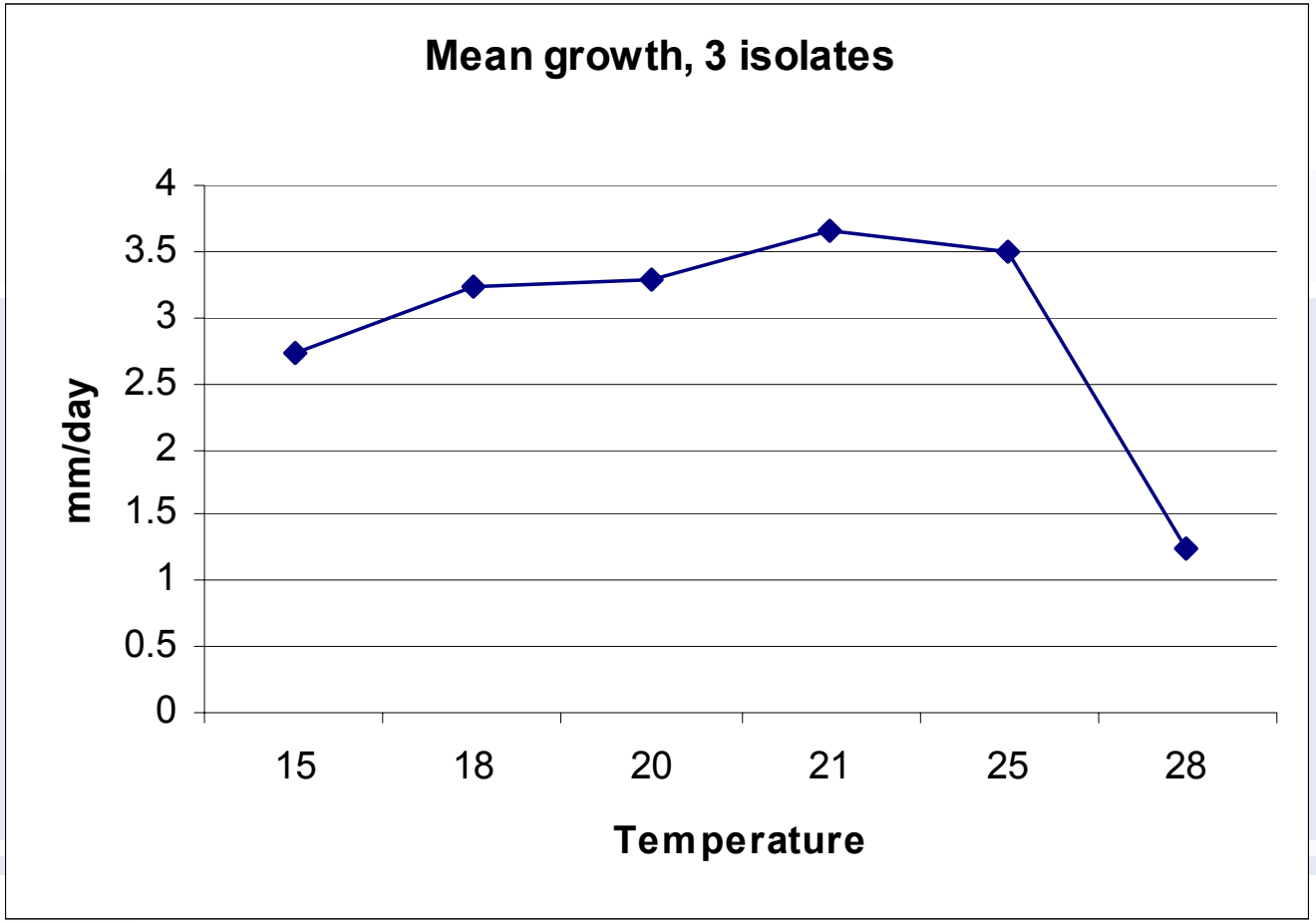
3. Optimum temperatures for growth of cultures agree with spore germination data



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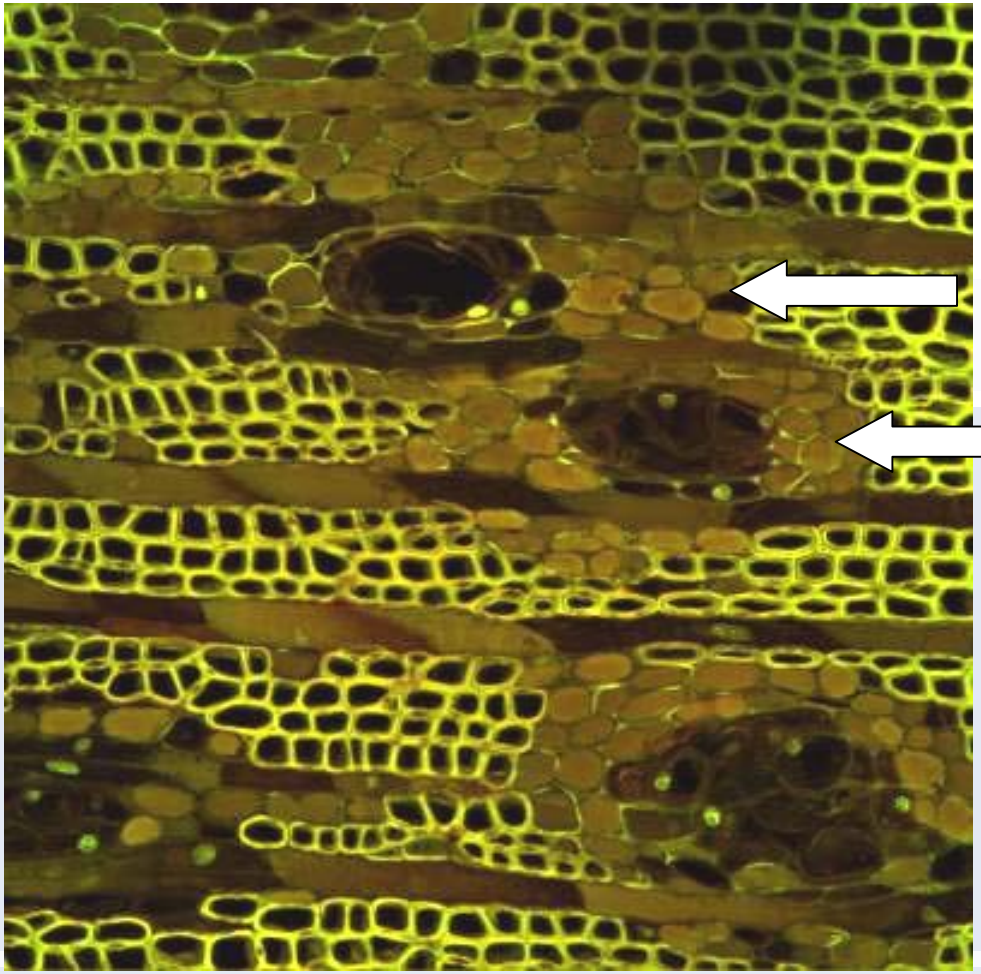
Anatomy of the disease



2-yr-old infection: resistance responses (resin ducts, tannins, phenolics)

Healthy side does not have these features

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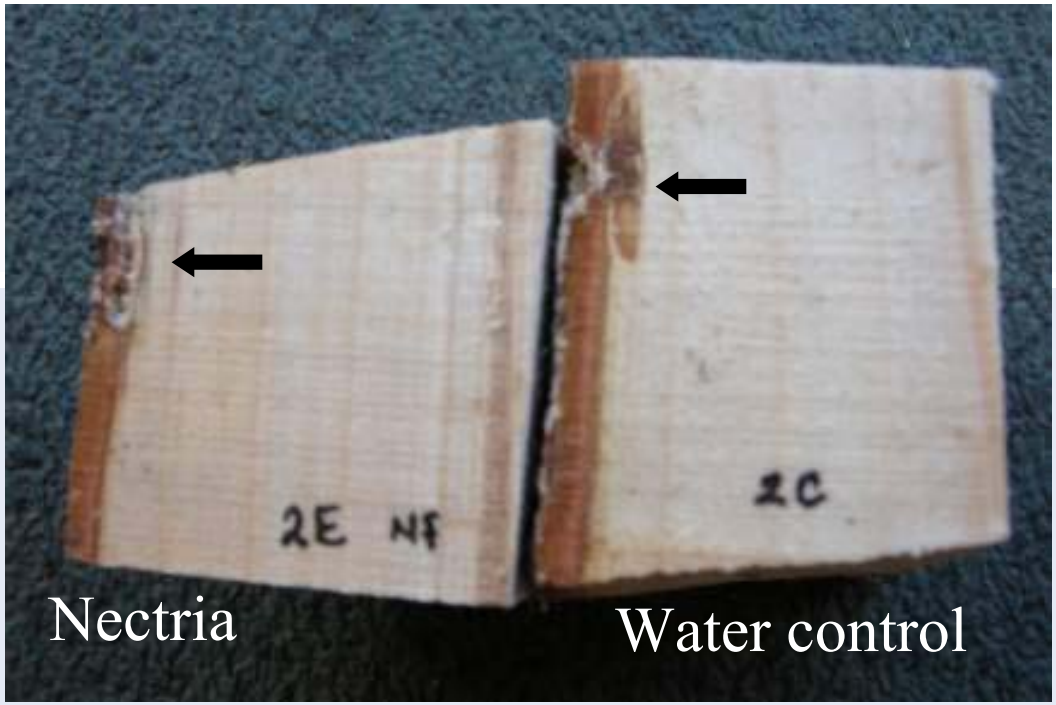
Early disease development and effect on host

Early infection stages, Nov. 2005

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



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Experiment to assess effect of spore type and inoculation method

April 2005

- 45 trees
- 3 inocula
  - Ascospores
  - Conidia
  - water
- 3 types of wounds

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Results after 7 months

- Some trees of all treatments are showing fluting
- Fluting is usually greater with Nectria than with water treatment
- Type of wound has more effect than type of spore used
- Deep wounds show greater fluting than shallow wounds

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What do we know so far?

- Ascospores are present in fruit bodies in all seasons
- A cluster of fruit bodies probably remains active for many months
- Moisture is required for spore release and probably dispersal
- *N. fuckeliana* grows best at warm temperatures, but can probably grow to some extent year-round in NZ
- Spore trapping will allow correlation of spore release with weather conditions
- Successful fruit body production in culture
- Infected radiata pine shows active resistance response. Study of early disease development is in progress.