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Ensis Forest Biosecurity and Protection

Exotic Pest and Disease Threats to New Zealand

Lists, Lists, Lists

- Lists help to record what the threats are BUT lists are invariably linked with ranking the threats.
- This talk will focus on first principles

Background

- NZ forest estate 90% *Pinus radiata*
- *Pinus radiata* is native to California, where the native stands are very restricted.

Background

- First planted in New Zealand in mid to late 1800s in shelter belts.
- Seed from shelter belts used to plant first forests.
- *P. radiata* is now planted worldwide.

Diseases in CA

- Common diseases in California include: Dwarf mistletoe, western gall rust and *Heterobasidion annosum*.
- Dothistroma is not present in the native stands.

- Dothistroma, Cyclaneusma and Diplodia.
- These are relatively minor diseases in North America.

Diplodia whorl canker

- Whorl canker is common in New Zealand; however, in most parts of the world, the disease causes shoot tip death and root disease.
- This pathogen behaves differently here.

Hypothesis

- *P. radiata* came to New Zealand without its associated pathogens.
- As “minor” pathogens were introduced here, they have had a serious impact because of reduced competition for the “food” source.

Nectria

- We would not have predicted that a minor northern hemisphere pathogen of spruce and true firs would have such a major impact on *P. radiata*.
- Lesson: It is difficult to predict how a pathogen will respond outside of its native range.

Western Gall Rust

- Is a serious disease of *P. radiata* in California.
- It is not present in NZ.
- WHY???

Western Gall Rust

- Produces millions of aeciospores per season
- Only infects elongating shoot tips
- Wave year effect



Why is WGR not in NZ?

- Northern and southern hemisphere seasons out of phase
- Long distance dispersal (ITCZ)
- WGR biology

Pathways for WGR

- The introduction of living infected material is the only viable mechanism by which the pathogen could establish here.
- Long distance dispersal is extremely unlikely.

Conclusion

- We cannot predict what will happen when a new pathogen arrives.
- History tells us that “minor” pathogens have had a major effect.
- Pathway management is key to preventing establishment of exotic diseases.