

The hunt for Queensland's "Red October"

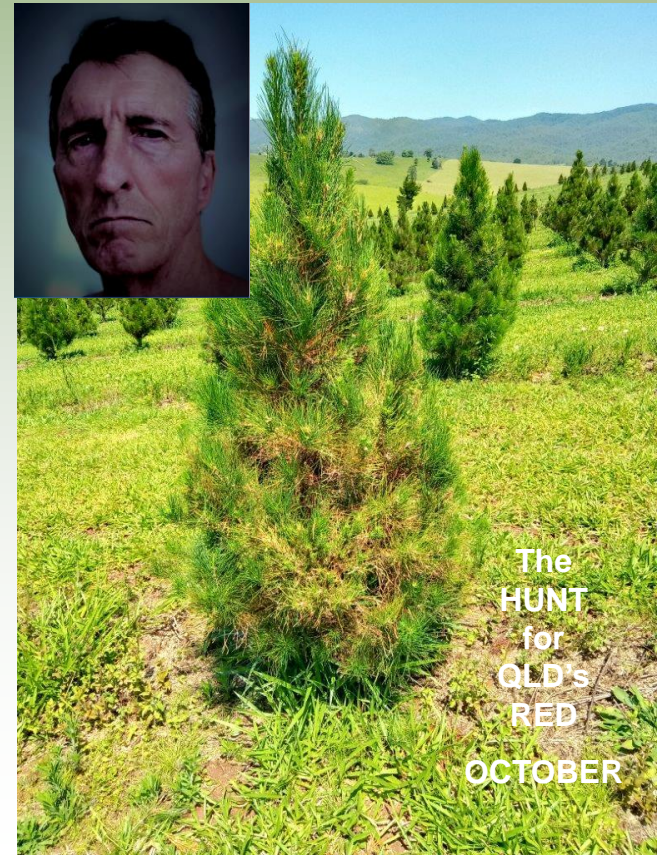


Cercospora Needle Blight
Pseudocercospora pini-densiflorae

2.5 years *post detection*:
Finding an elusive invader!



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16 October 2023



NEW TO AUSTRALIA TROPICAL PATHOGEN

- April 2021 Biosecurity Qld (BQ) sampled blighted *Pinus radiata* on a private Christmas tree farm; Atherton Tablelands, north Queensland.
- October 2021 HQPlantations (HQP) informed that a new to Australia tropical *Pinus* foliage pathogen, Cercospora Needle Blight (CNB), had been confirmed present in North Queensland.
- November 2021 BQ undertook delineation surveys within young (deemed susceptible) HQP *Pinus* plantations, north of Cardwell Qld.
- November 2021 BQ subsequently confirmed positive single detection on a one-year-old *Pinus caribaea* var. *caribaea* seedling.

DECLARED ESTABLISHED

- **November 2021 BQ tracing of interstate supply nurseries, to the initial NQ farm detection, led to surveys on a Stanthorpe *Pinus radiata* tree farm (NSW/Qld boarder region).**
- **November 2021 BQ confirm presence of CNB on the Stanthorpe farm.**
- **November 2021 (approximate) interstate supply nursery deemed free of CNB, therefore not the source of the pathogen.**
- **Unknown date; the Consultative Committee on Emergency Plant Pests (CCEPP) declared CNB established (due to is wide distribution within Qld).**

PATHOGEN BACKGROUND

Naming & Synonyms:

Imperfect asexual state - Anamorph

- *Cercospora pini-densiflorae*
- *Asteromella* spp. (spermatial anamorph)
- *Cercoseptoria pini-densiflorae*

Perfect sexual state – Teleomorph

- *Mycosphaerella gibsonii*

Common Names

- Needle blight of pine
- Brown needle blight of pine
- Brown needle disease (BND)
- *Cercospora* blight of pine
- ***Cercospora* needle blight**



EPIDEMIOLOGY

- Targets older leaves in young trees (1-2 yrs. old).
- Spreads from the lower crown up to the tips of branches.
- Symptoms can be confused with other disorders & similar foliage blight diseases e.g., *Dothistroma*, Red Needle Cast, nutrient deficiencies.
- Under humid conditions spores are liberated.
- This disease persists as fungal structures can overwinter in affected needles (like *Dothistroma*), sometimes as latent infections in sound needles.
- Latent infections give rise to disease in the spring of the following year.

EPIDEMIOLOGY

- Can remain viable for many months in dry infected foliage and subsequently produce large numbers of spores when wetted (Ivory, 1987).
- Rain splash and overhead irrigation in nurseries disperse spores.
- Moist humid conditions assist spore dispersal and infection (Ivory and Wingfield, 1986; Ivory, 1987).
- Spread under field conditions is directly correlated with high rainfall (Singh et al., 1988).
- Spores are easily dispersed within and between neighbouring plants when they are closely-spaced in nursery beds.
- Fortunately spore dispersal is less efficient between trees in plantations (Ivory, 1987).

Murray Upper SF Pseudocercospora BQ sampled trees 15 October 2021:

- Cpt 210, Murray Upper LA : plant date April 2020



HQPLANTATIONS CONCERN!



- **NEW 'Tropical Pathogen'** that can cause a serious needle blight of both exotic and native pines, particularly at the later nursery stage.
- Has caused major production issues of pine seedlings in some countries (Japan and Taiwan).
- Under epidemic conditions in nurseries, near 100% of seedlings have been infected with 50-80% mortality (Ito, 1972).
- Has been recorded as causing severe defoliation (and sometimes mortality) in young plantations (up to two years of age).
- Hosts all *Pinus* plantation species grown in Queensland.
 - possibly including *Pinus* hybrids.
- Possible Trade implications.

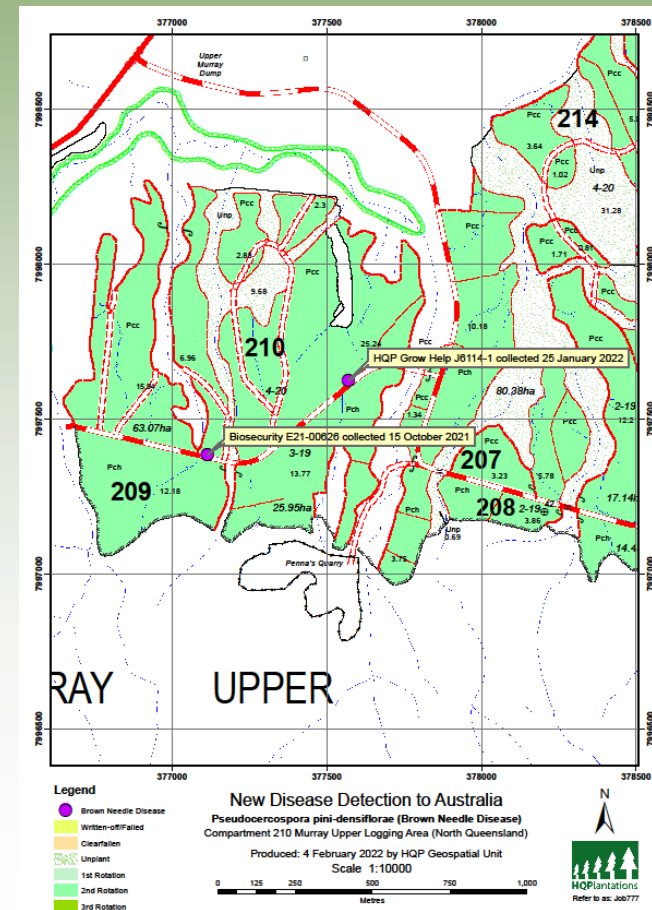
HQPlantations RESPONSE

- Immediate plant material movement restrictions from North Qld (Oct 2021).
- Enhanced wash-down hygiene measures re vehicles, equipment and boots.
- Wash-down measures re vehicles exiting north Qld plantations.
- January 2022 surveys and impact assessments Cardwell surrounds (North Qld)
 - Including Murry Upper BQ plantation detection site.
- Surveys SE Qld including, Stanthorpe tree farm detection site (with permission).

July 2022 SECOND North Qld survey of Cardwell surrounds

- Including resampling of the actual BQ positive detection tree.
- BQ diagnostic identification protocols acquired.
- All samples PROVED ELUSIVE to CNB!
- Initiated FWPA research application.
 - (Commenced September 2023)

October 2022 THIRD N. Qld survey

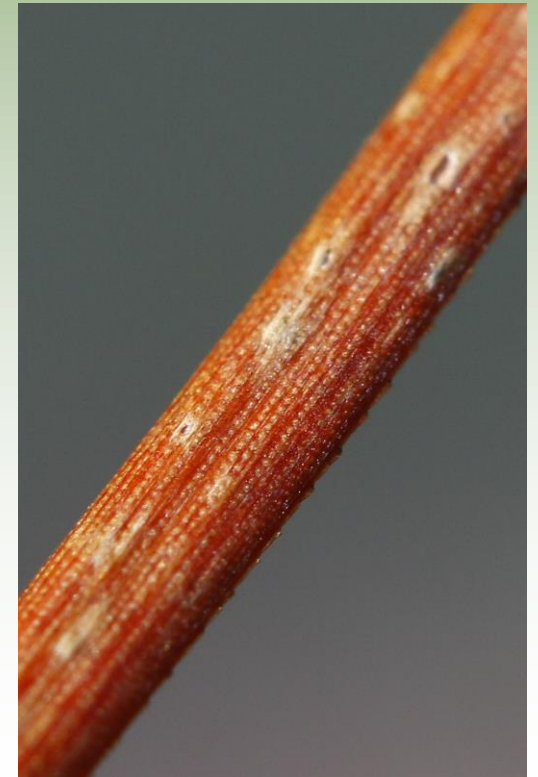


Hunt for the Elusive invader:

What visually separates CNB for other needle blights?



Elusive invader:



DIAGNOSTICS: No Pseudocercospora!

Aplosporella sp.

Bipolaria scrokiniana

Curvularia clavate

Diaporthe sp.

Diplodia sapinea

Fusarium parvisorum (Notifiable pathogen-Mango)

Lophodermium australasiae

Nigrospora p.

Neopestalotiopsis sp.

Phaeomoniella effuse

Pestalotiopsis iberica, can cause Pine needle blight (New
Australian record)

Pestalotiopsis lespedezae

Pestalotiopsis telopeae

Pestalotiopsis vismiae

Where was it: is there any impact, is it actually established, is CNB just elusive or is it actually absent?

- November 2022 FIRST positive HQP identification outside of original BQ detections.**
- Diagnostically CNB proved difficult to determine, with refinements to supplied protocols required.**
- Positive bands from the diagnostic PCR when sequenced come back as CNB.**
- The issue in the past has been sequencing a small PCR product of <200 bp.**
- Special conditions need to be adhered to and once those are employed the sequence comes back as good quality.**
- Re-sequencing of “false” positive diagnostic bands from previous samples resulted in further positive confirmations.**

December 2022

“Still elusive and impact currently unknown”

- Confirmed at multiple locations within Queensland, including within Beerburrum’s SEQ coastal estate.
- Confirmed hosts:
 - *Pinus radiata*
 - *P. caribaea* var. *caribaea*
 - *P. caribaea* var. *hondurensis*
 - *Pinus* hybrid (*P. elliottii* var. *elliottii* x *P. caribaea* var. *hondurensis*).
- Infected ages 1 – 9 years.

NOTE: Sydney diagnostic unit believe it would be difficult to identify to species level if <200 bp.

THERE YOU ARE, I SEE YOU NOW!

