

Integrated Disease Management Strategies for Citrus Black Spot and 'Emperor' Brown Spot



Dr Tamil Thangavel, Plant Pathologist

Bundaberg Research Facility, Department of Agriculture & Fisheries,
Queensland Government

Project Team Members



Tamaya Peressini
Horticulturist, Mareeba DAF



Kaylene Bransgrove
Pathologist, Mareeba, DAF



Dr Andrew Miles
Pathologist/R&D manager, Emerald,
Superior Production Co



Malcolm Smith
Plant breeder, Bundaberg, DAF



Dr. Tamil Thangavel
Pathologist, Bundaberg, DAF



Dr. Lindy Coates
Pathologist/project
lead, Brisbane, DAF



Tony Cooke
Pathology
experimentalist,
Brisbane, DAF

Funding bodies

**Hort
Innovation**
Strategic levy investment

**CITRUS
FUND**



Queensland Government

Department of Agriculture and Fisheries

Programme committee

- Brian Gallagher, Citrus Monitoring Services
- Malcolm Wallis, Citri Care Pty.Ltd

Acknowledgments



abbotsleighcitrus



nutranō
PRODUCE GROUP



Citrus
Australia



Hort
Innovation



SPENCER RANCH
— PREMIUM * QUALITY —



favco®
fruit & vegetable company

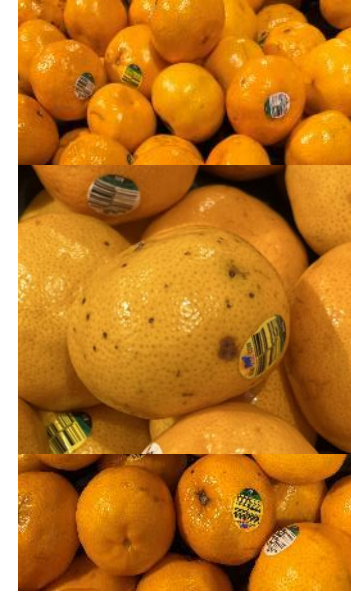
Family business built on family values

Blue Rocks, 411 Gayndah
Mundubbera Road, Glenrae



BUGS
FOR
BUGS

Project Background



Two important citrus diseases

- Emperor Brown Spot (EBS) - caused by *Alternaria* sp.
- Citrus Black Spot (CBS) – caused by *Phyllosticta citricarpa*



Disease Management

a total of all actions, intentional or not, that serve to regulate disease levels so that remain below the economic threshold levels

To screen fungicides for reduction of *Alternaria* inoculum/infection when applied pre-petal-fall.

	Pre-flowering Treatment (Mid Aug - End of September)	Pre-flowering Treatment + Until November
Spray Frequency	Weekly	Monthly

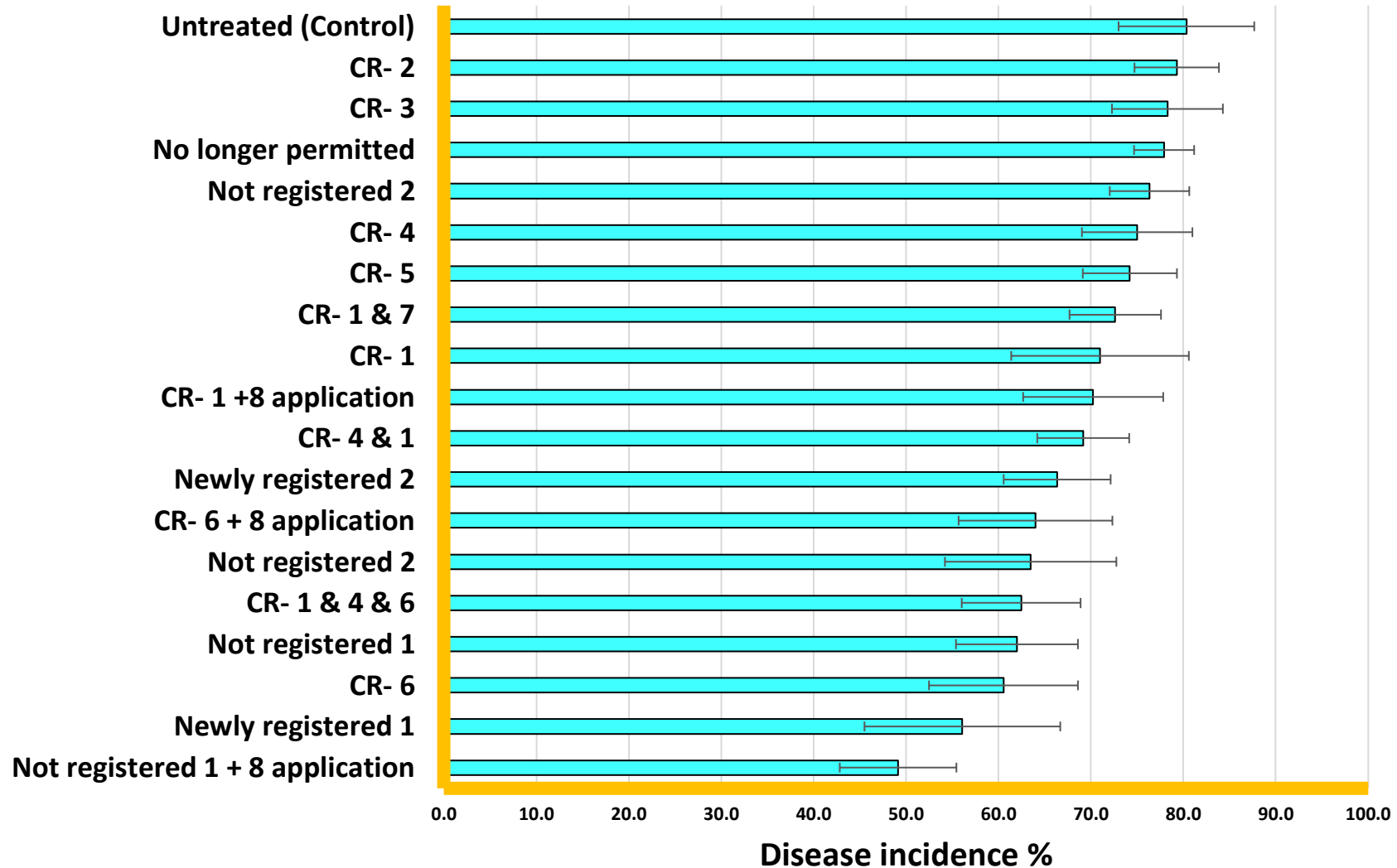
Trial location: Mundubbera

Variety: Daisy

Treatments: 18+1



Treatments applied pre-petal *Alternaria* sp. inoculum prior to flowering



Ongoing Trial at Wallaville

To evaluate the effect of pre-petal fall application of selected fungicides against 'Emperor' Brown Spot

Trial site	Wallaville
Variety	Murcott
Treatments	9 + 1 control
Spray frequency	2 application + Fortnightly interval

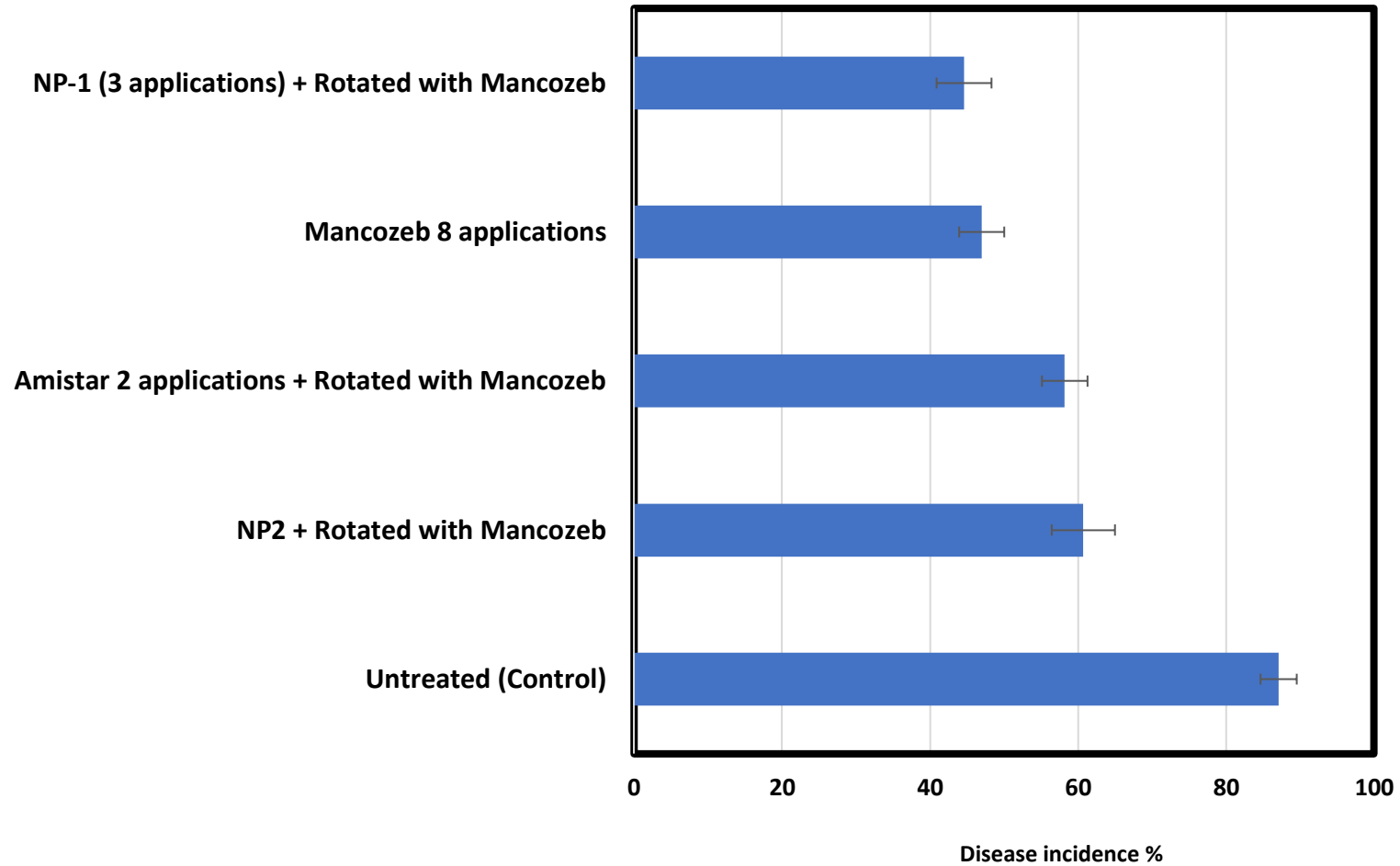


To test a field evaluation of two new SDHI products (NP 1 & NP 2) in comparison to an industry-standard fungicide program.

Trial site	Wallaville
Variety	Murcott
Spray frequency	Monthly



Trial: Evaluation of new SDHI products against 'Emperor' Brown Spot.



Efficacy of NUL3446 compound against 'Emperor' brown spot

Test the effectiveness of low-residue fungicide (NUL446) against "Emperor" Brown spot.

Trial locations:

Munduberra

Variety:

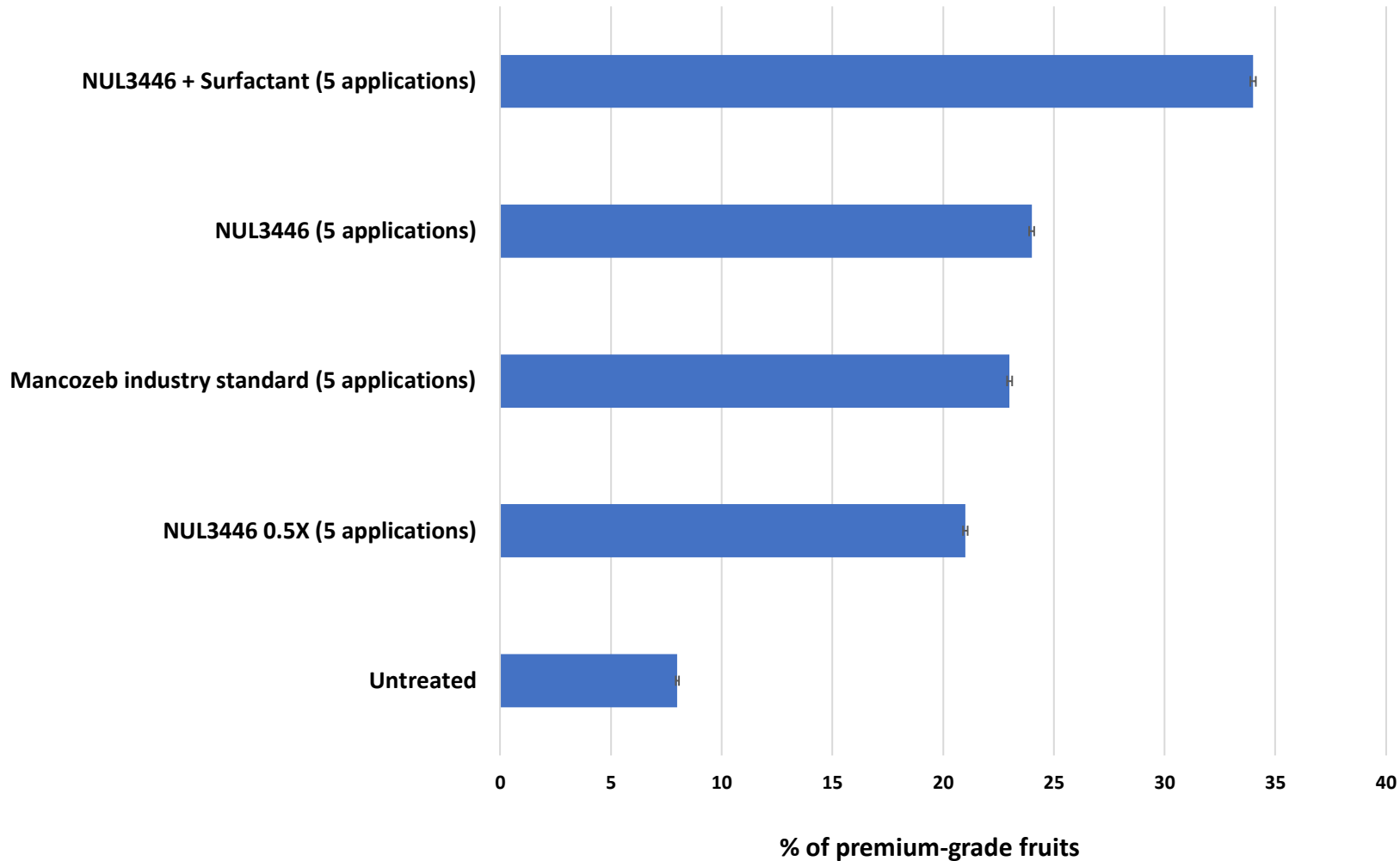
Daisy

Treatments:

10 + Untreated



Efficacy of NUL3446 compound against 'Emperor' brown spot



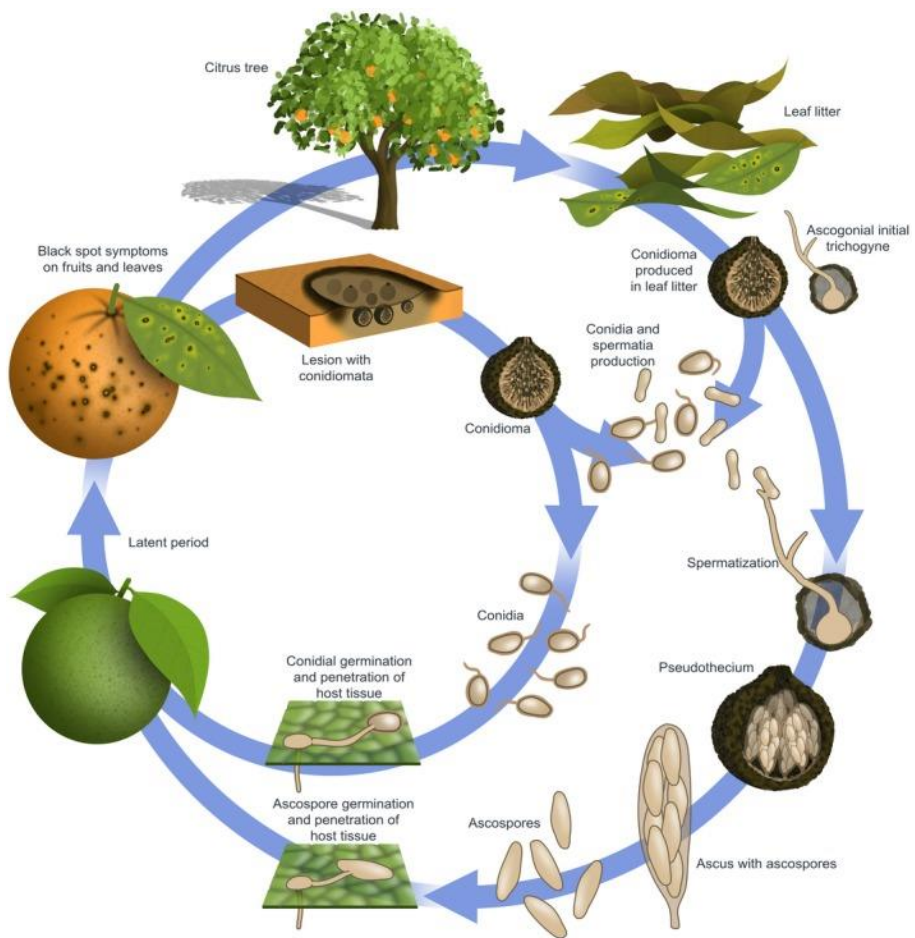
Low-residue fungicide
(NUL3446) showed efficacy in
reducing EBS incidence in fruits.



Key Trial Findings in Managing EBS Disease (2022- 2023)

- **Trials 1 and 2:** Fungicide applications pre-petal fall show potential for improved management of EBS
- **Trial 3:** Low residue fungicide NUL3446 shows potential for EBS management when applied late in the season

Trial: Timing of early copper application and pruning treatments on CBS incidence



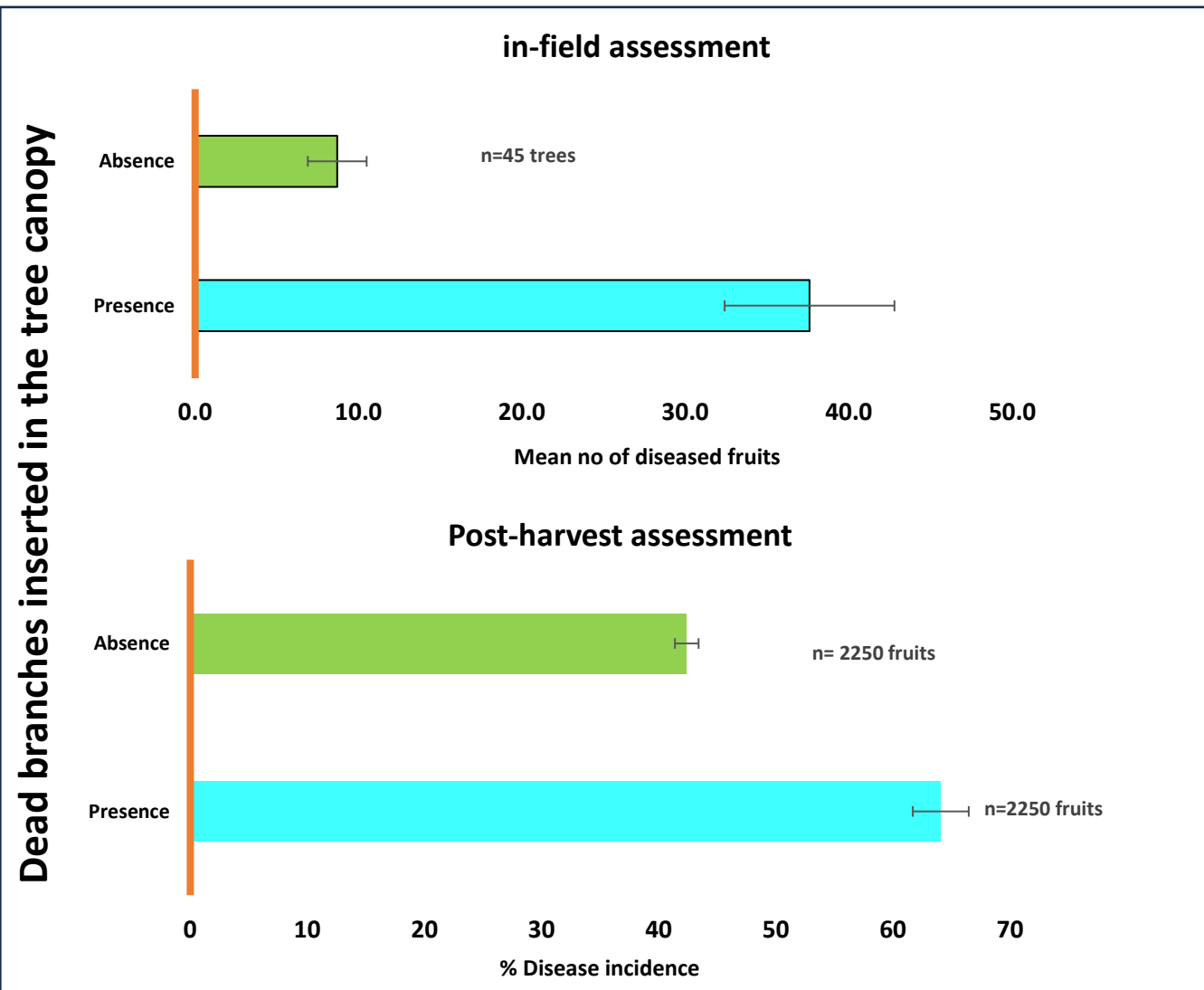


Dead branches in the tree canopies increased CBS levels in imperial Mandarins



Trial conducted at Spencer Ranch at Wallaville

Dead branches in the tree canopies increased CBS levels in imperial Mandarins



2023/24 trials: To test if CBS inoculum source is not from leaves





To determine the effect of dead wood size on disease



To test if the reservoir of the pathogen in branches can be reduced by treating them with chemicals.



To test if the removal of deadwood reduces CBS in Imperial mandarin fruit.





Other ongoing trials/work:

- Testing the phytotoxic effects of acidic, alkaline, and soluble copper fungicides on fruits.
- Collaborating on EBS and CBS disease prediction modeling with CRI, South Africa.
- Developing methods to break the dormancy of the CBS latent phase on fruits.

For more information, please contact me:

Tamil Thangavel, DAF
Bundaberg Research Facility, Bundaberg
tamil.thangavel@daf.qld.gov.au
0481191993