Department of Industry, Tourism and Trade

Mango Dieback

NT FARMERS

AUSTRALIAN MANGOES®

NORTHERN TERRITORY GOVERNMENT

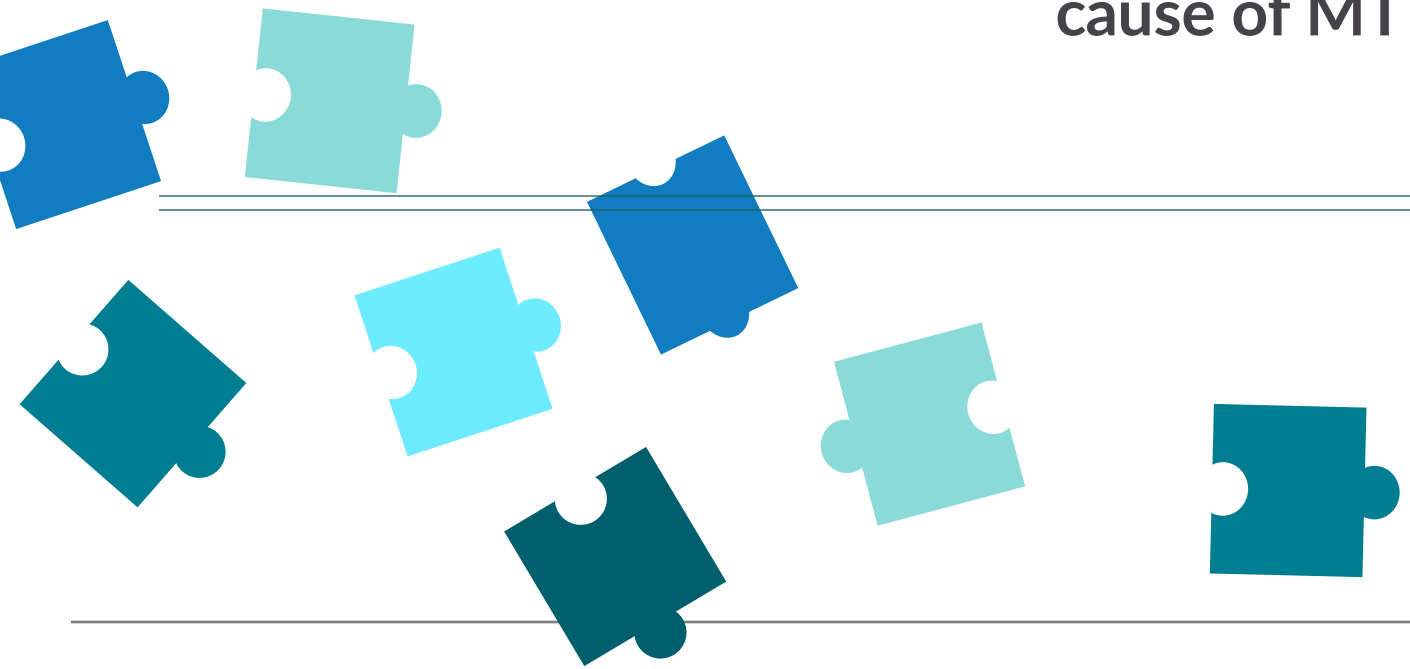
Acknowledgements

This summary is a compilation of the work by:
Alan Niscioli, Anne Walters, Brian Thistleton, Chelsea Moore, Jose` Liberato, Lorenzo Meschiari, Lucy Tran-Nguyen, Merran Nielsen, Michael Finey, Sachi Kithulgoda, Sajal Zia, Sharl Mintoff, Sonu Yadav, Stan Bellgard, Tony Asis, and Upendra Shekhawat.

AMIA

NT Farmers

It is important to note that NO exotic pathogens have been identified as the cause of MTTD.



NORTHERN TERRITORY GOVERNMENT

2017

NUTRITONAL

EXOTIC

?

CAUSE

ENVIRONMENT

WILL CHEMICALS WORK

IPM OPTIONS

SPREAD

DETECTION

NORTHERN TERRITORY GOVERNMENT

MTTD

Symptoms

- Symptoms include partial twig death, dieback of branches, occasionally plant death.

Location

- Reported on 15 properties in Darwin

Cause

- No confirmed cause.

Common dieback

Symptoms

- Symptoms include dieback of branches, rarely plant death.

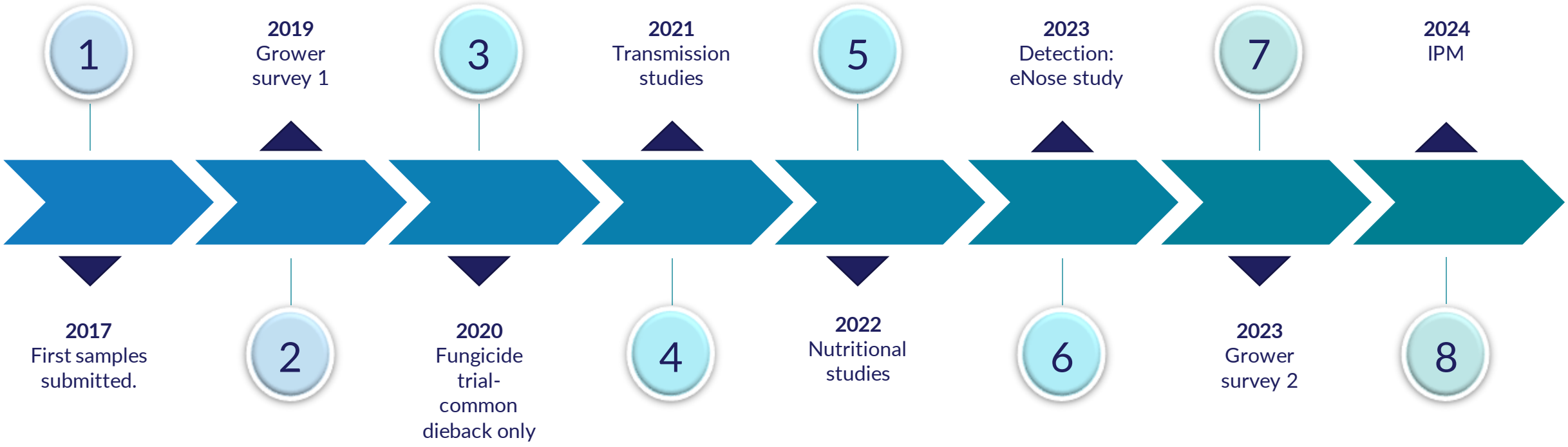
Location

- Native organisms found throughout NT & Australia.

Cause

- Caused by Botryosphaeriaceae (Stem End Rot) fungal pathogens.

Timeline



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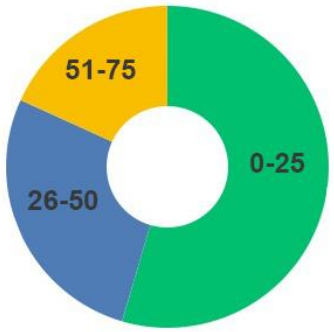
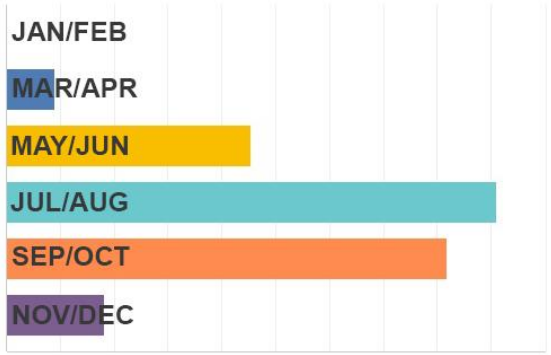
Grower surveys (all dieback)

2019

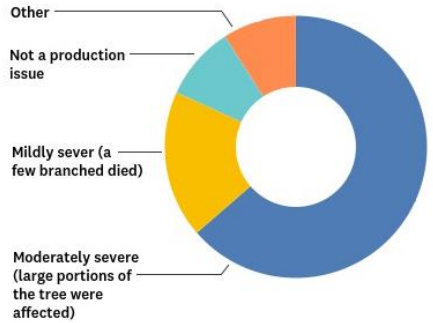
% trees affected



months expressed

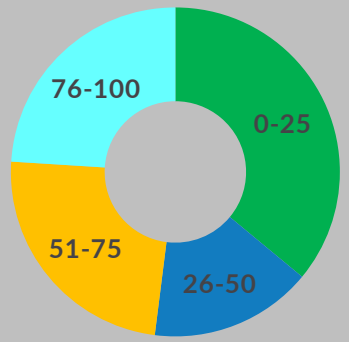


severity

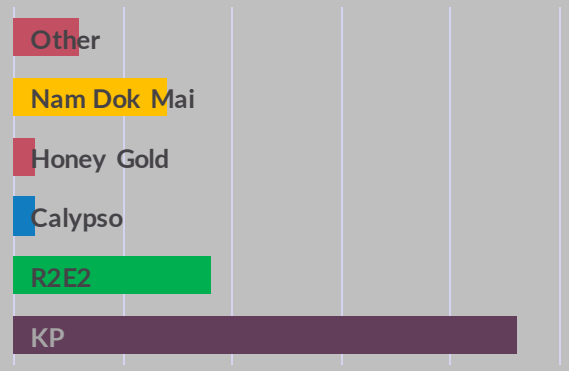


2023

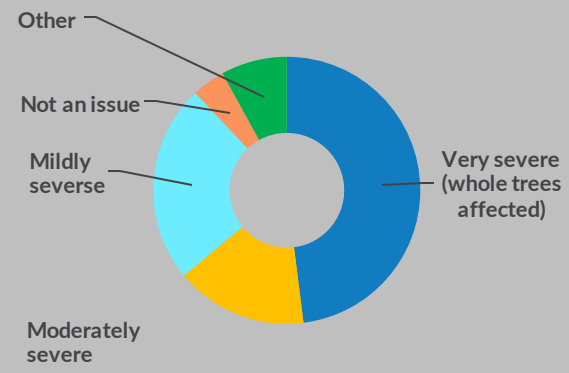
% trees affected



varieties affected



severity



Collaborative surveys carried out by NT Farmers, NT DITT and AMIA, 2023 data courtesy of Celine Jordens, AMIA.

200+

cultures grown for ID

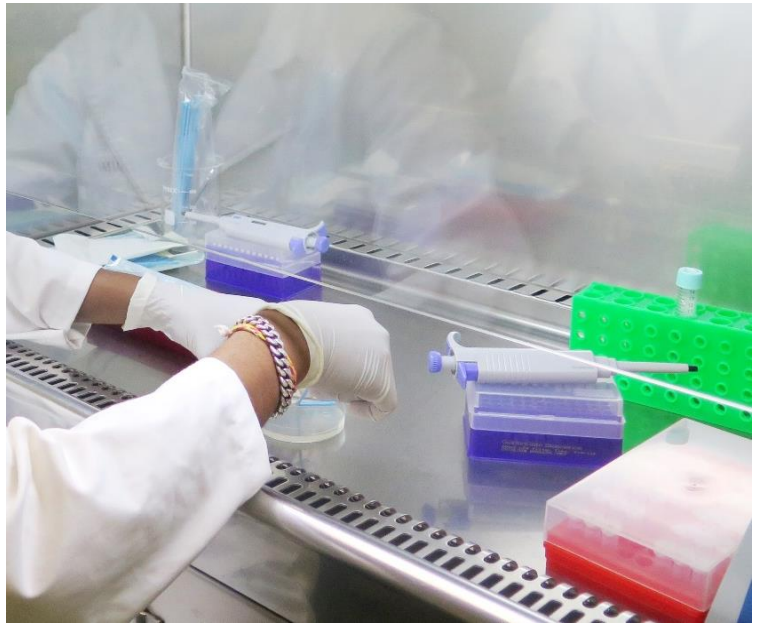
39

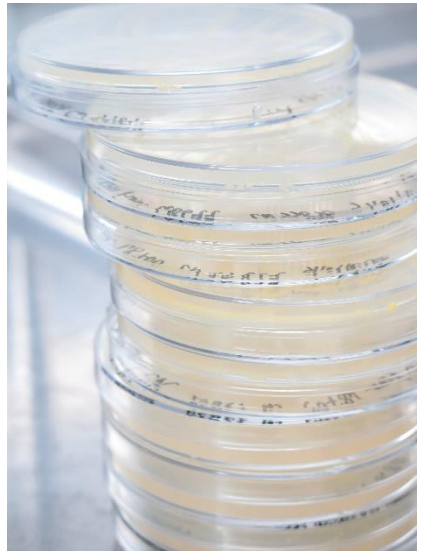
different species of local fungi and bacteria isolated.

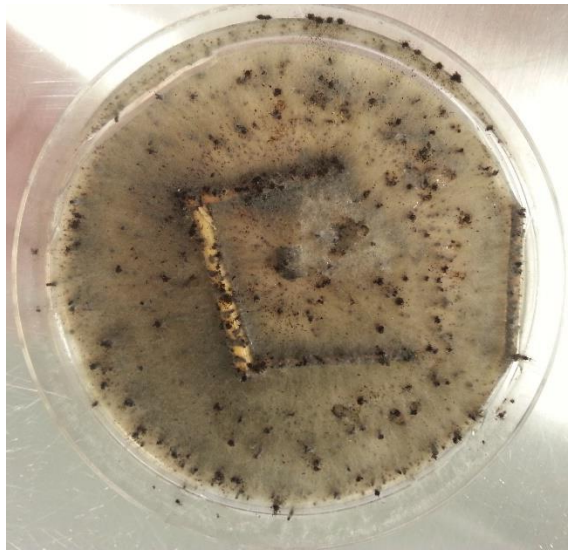
5,000+

Fungi & bacteria DNA isolated direct from infection, no SER fungi.

Pantoea sp., Colletotrichum sp.







Internally funded through the Plant Pathology branch and “Next Generation Sequencing” project by Nielsen, M; Zia, S.; Yadav, S. (unpublished).

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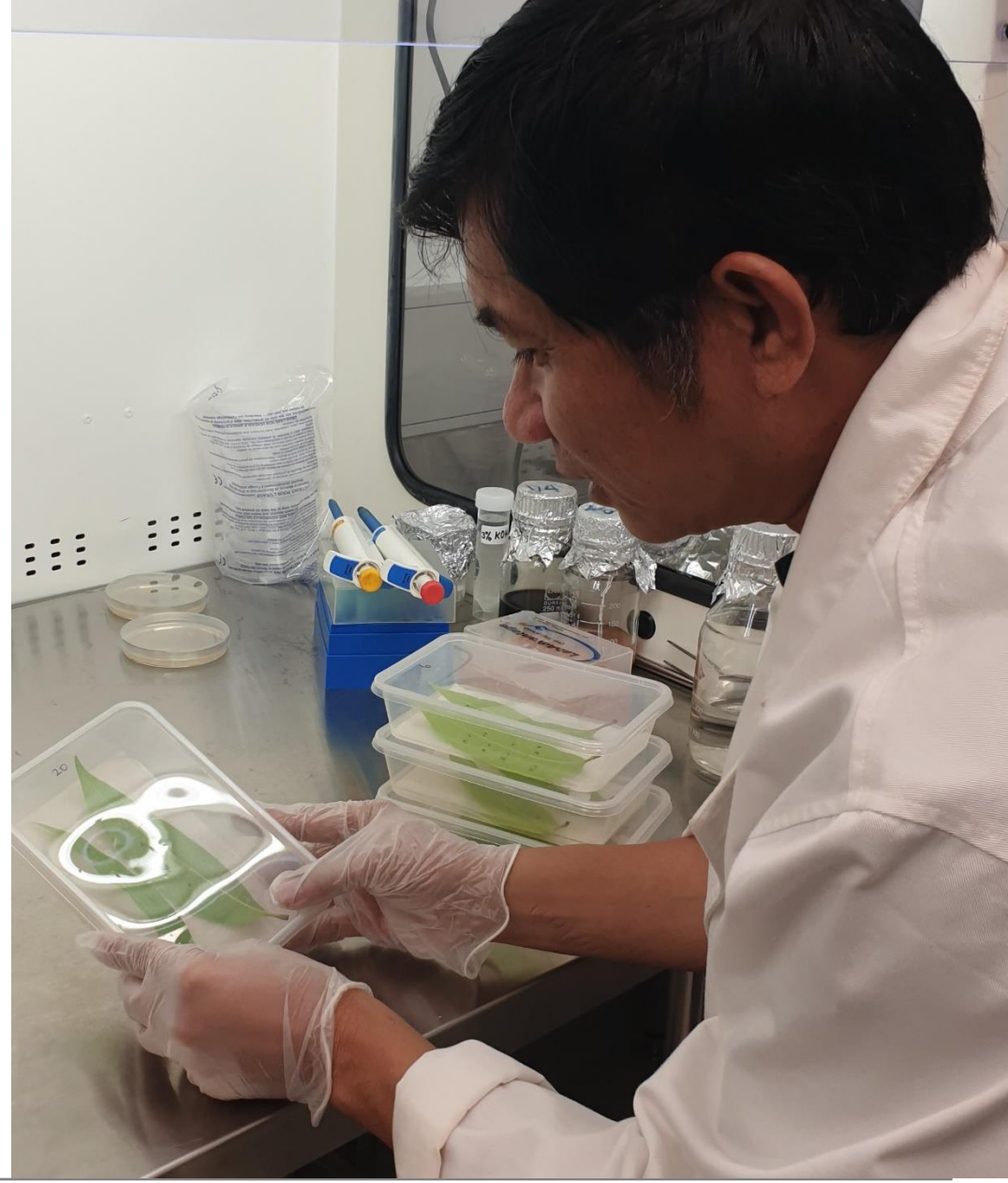
Transmission (MTTD)

No transmission:

- Soil from an infected orchard used as the media for potted plants (nursery trial)
- Grafted healthy plants with symptomatic scion (nursery trial)
- Injected bacteria into the buds and leaves (laboratory and nursery trial)

Transmission

- Potted healthy plants in orchard under infected trees in contact with soil
- Potted healthy plants in orchard under infected trees NOT in contact with soil



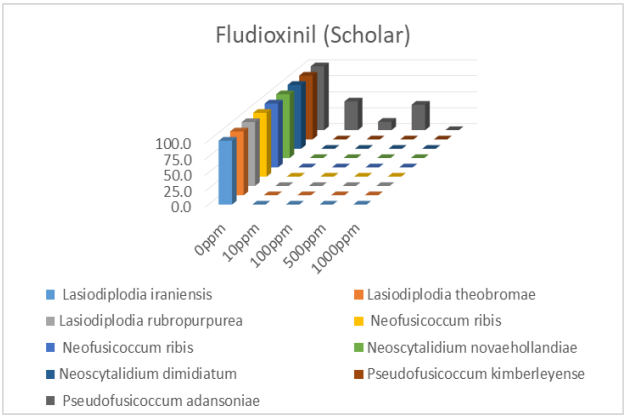
Internally funded through the Plant Pathology branch, with assistance from Plant Industries staff. Asis, T.

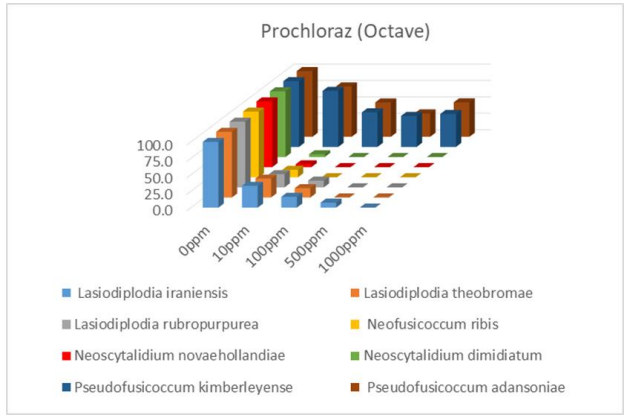
Fungicide control (Common dieback)

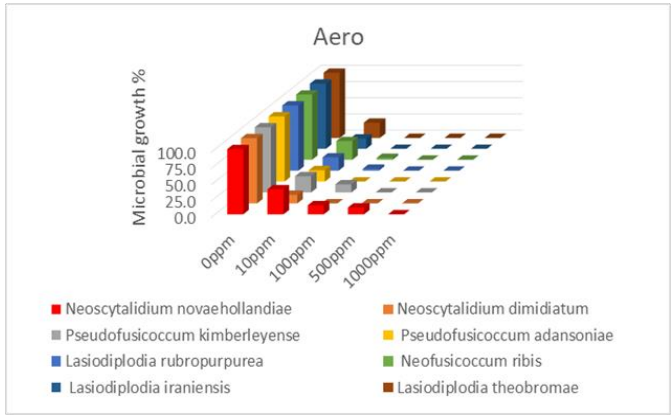
Petri dish trials:

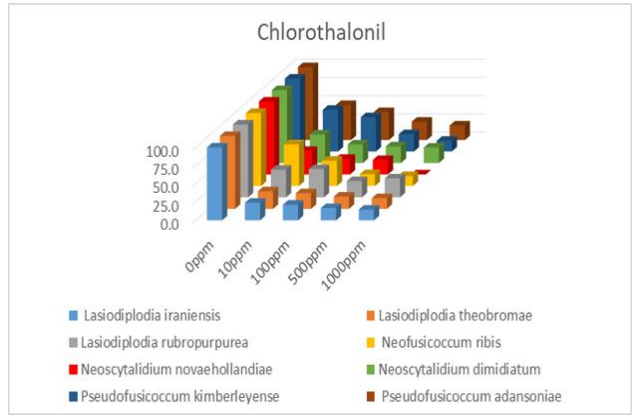
- Fludioxonil (Scholar)
- Prochloraz (Sportak)
- Azoxystrobin (Amistar)
- Meterim+ Pyraclostrobin (Aero)
- Mancozeb
- Chlorothalonil
- Copper oxychloride

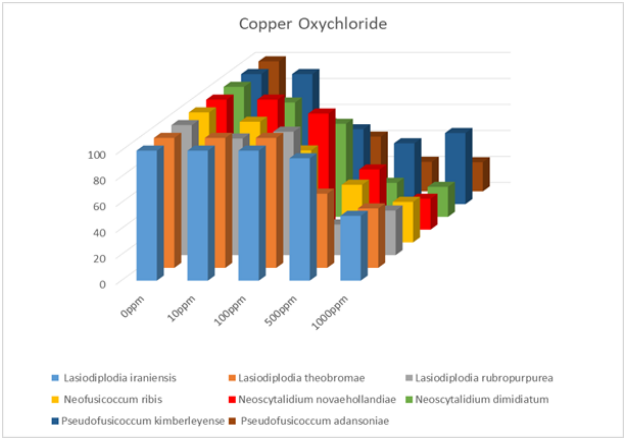
Fungicide control (SER fungi)

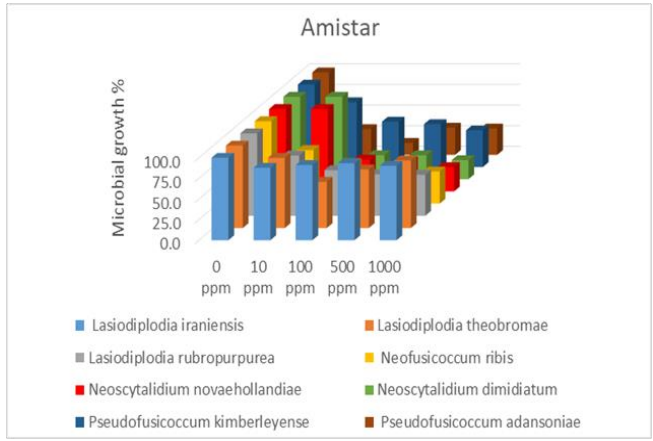


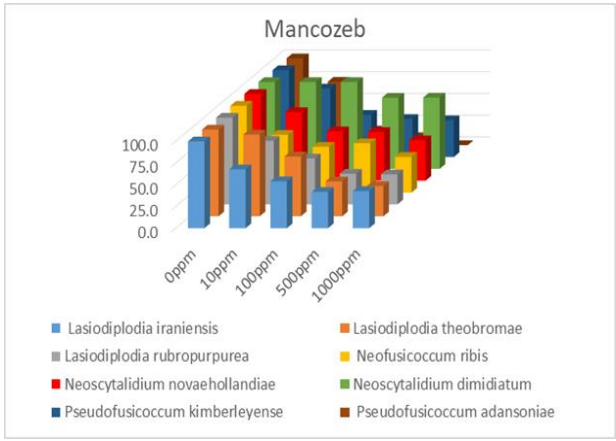












Internally funded through the Plant Industries branch, with assistance from Plant Pathology staff.
Niscioli A.

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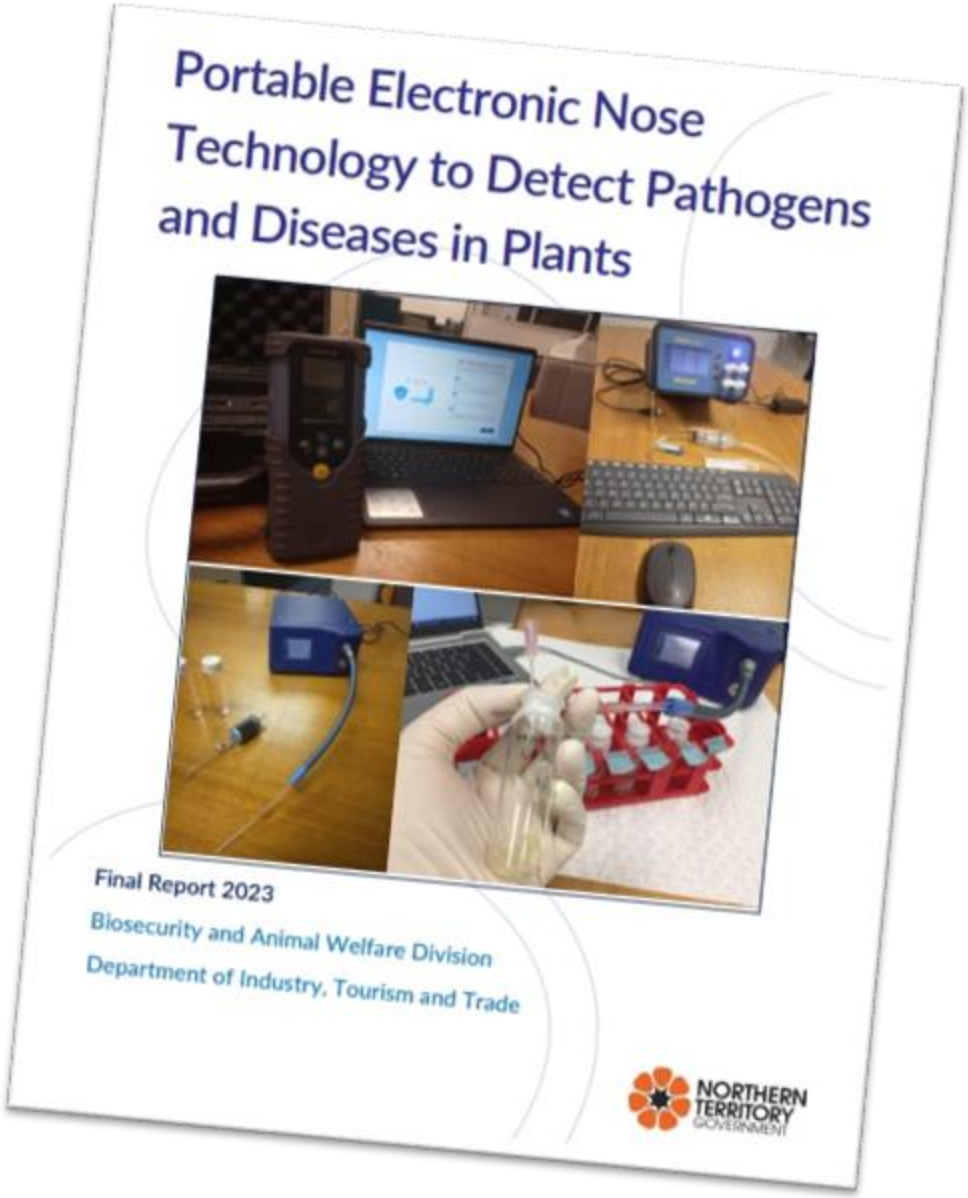
Detection (eNose study)

- Develop pure cultures of plant pathogens and controls for testing using e-nose devices, including *Pantoea sp*.
- Used experimental and field-collected samples, under laboratory conditions, and assessed the relative ability and efficacy of three e-nose devices for plant disease detection under NT conditions.
- GC-MS analysis confirmed unique VOC fingerprints of pure pathogen cultures, and infected plant materials.



Source: Ratnayake W. (2023) Portable electronic nose technology to detect pathogens and diseases in plants. Collaborative project with CDU, funded by the Federal Government's Agricultural Innovation Hubs program thr the Northern Hub.

MTTD

Detection

- Unknown

Transmission

- Not soil based
- Not spread by grafting.

Control

- Unknown.

Common dieback

Detection

- Identification through microbiology or molecular biology.

Transmission

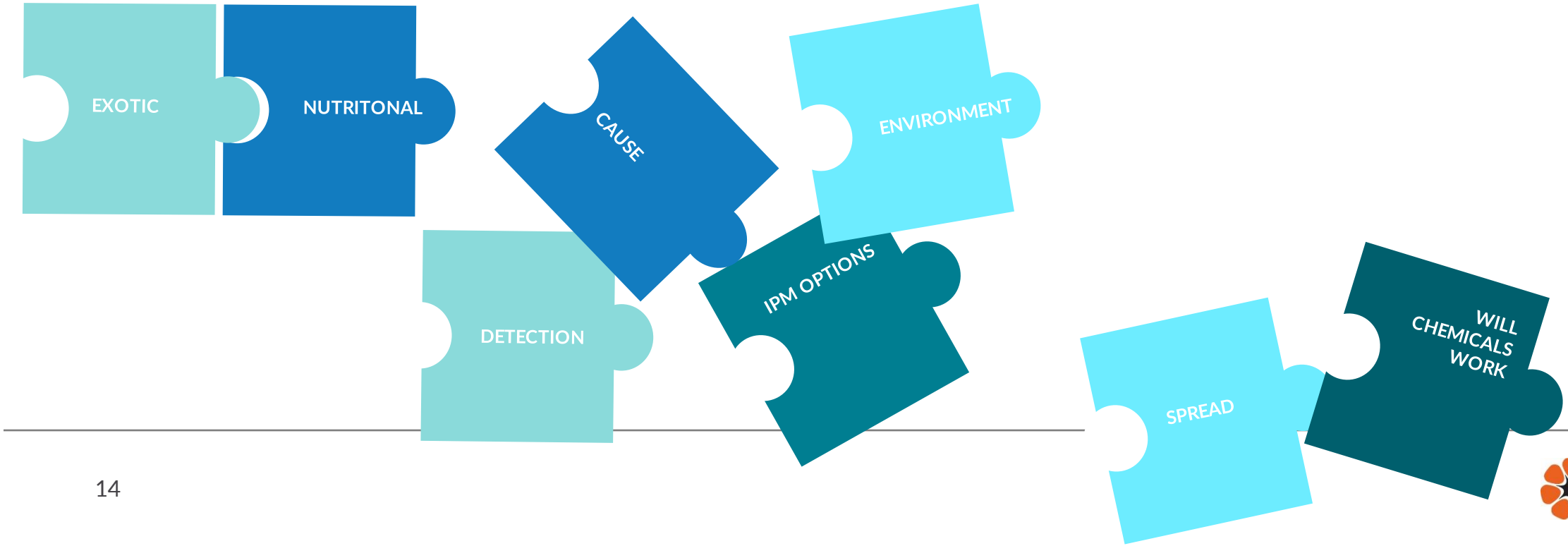
- Spread through spores which enter the plant and remain passive until stress triggers a pathogenic reaction.

Control

- Known physical and chemical controls.

Going forward

- Nutritional analysis study in publication process (release date 2024).
- IPM- Plant Activators to improve plant defence system (current program).
- Recent federal grant application submitted for collaborative project between NT DITT, UNE, AMIA and EE Muirs.
- Insect trials.



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Thank you

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