

# Efforts into the chemical control of dieback

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SAMAC

*proudly presents*

Mac Day'24

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**SAMAC**  
Macadamias South Africa NPC



9 – 11 September 2024





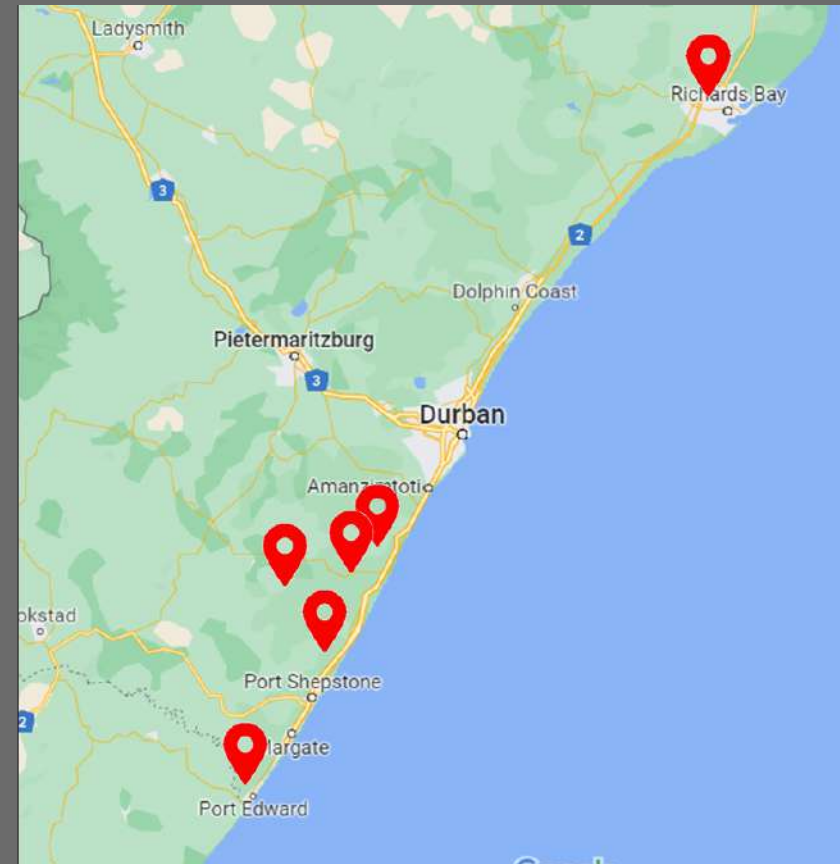
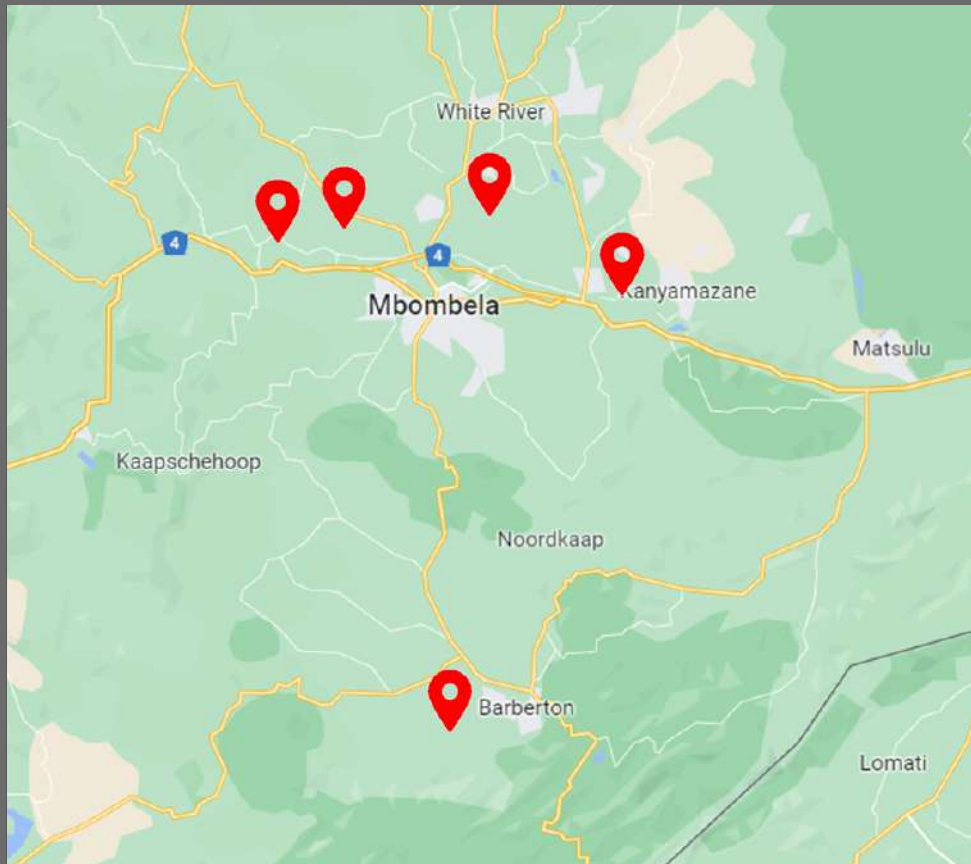
# Objectives

1. Determine the cause of dieback.
2. Examine the virulence of the most common species & evaluate the tolerant and susceptibility of different macadamia varieties.
3. Evaluate fungicides in preventing fungal causing dieback in macadamia trees.
4. Track the mode of introduction of the causal agent of dieback into the orchards.

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# Collecting Samples



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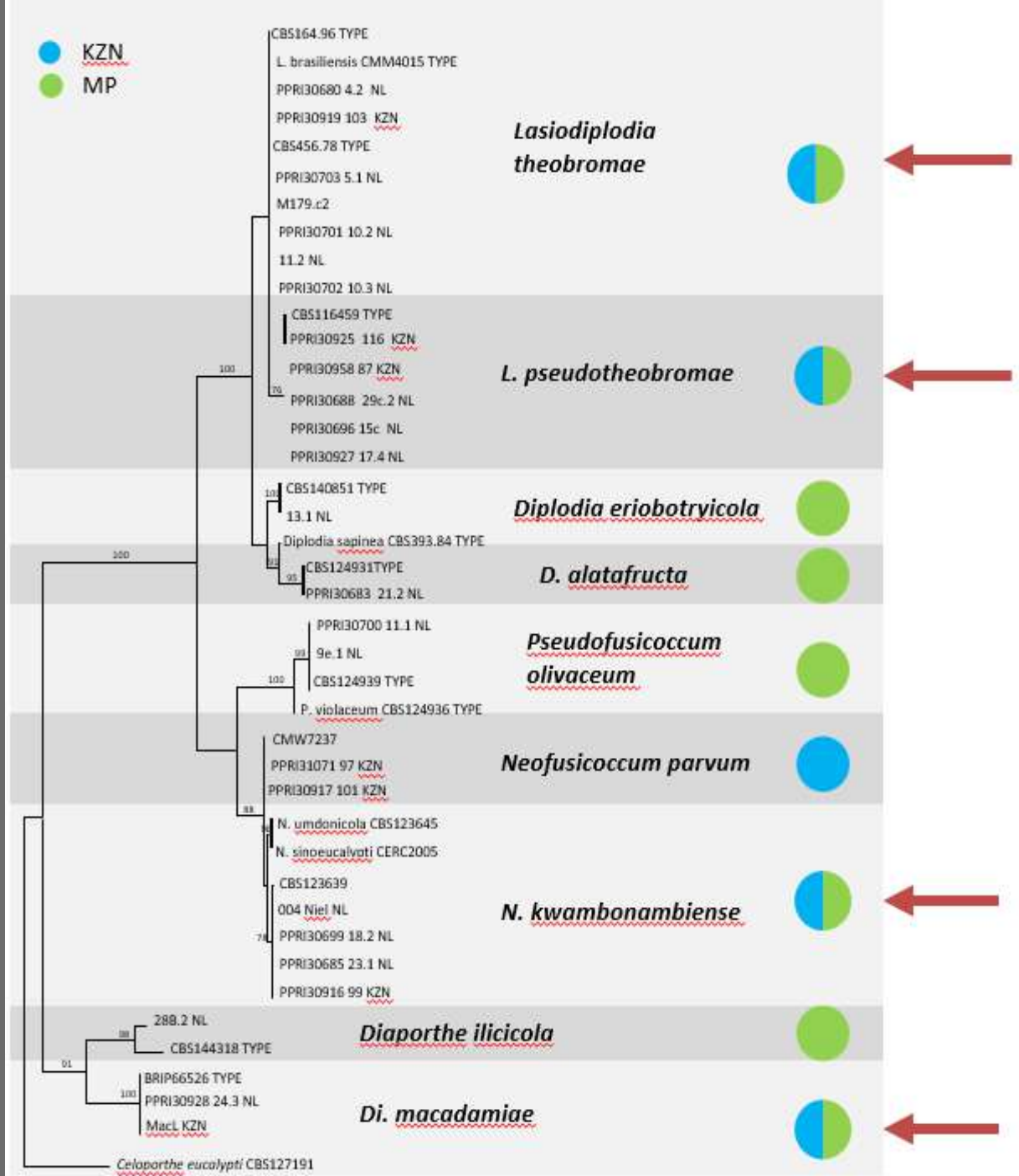




Nine species were identified:

- Seven *Botryosphaeriaceae* species
- Two *Diaporthaceae* species

Maximum Likelihood (ML) tree of the combined data set of ITS and *TEF1*- $\alpha$  loci sequences.



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# Evaluating the Virulence of Common Fungal Species & Tolerance of Macadamia Varieties

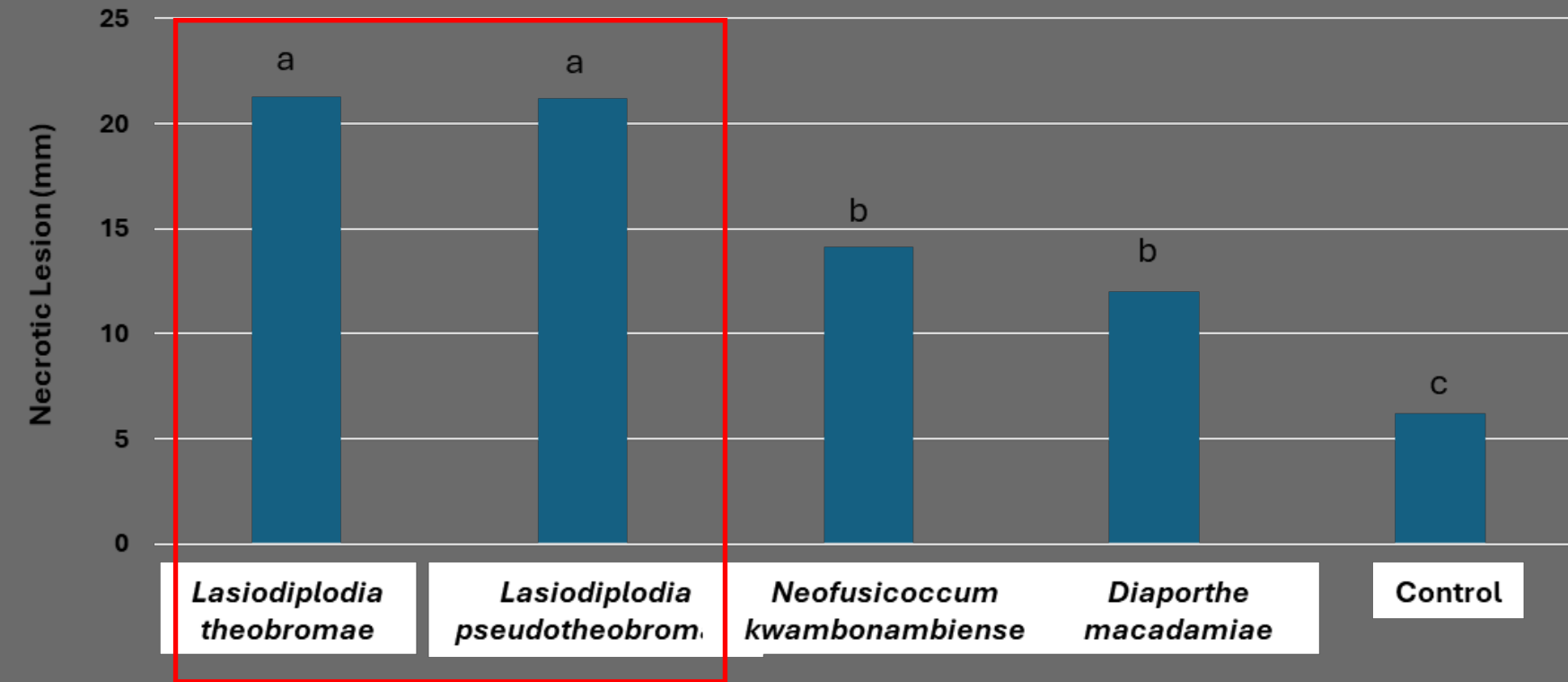






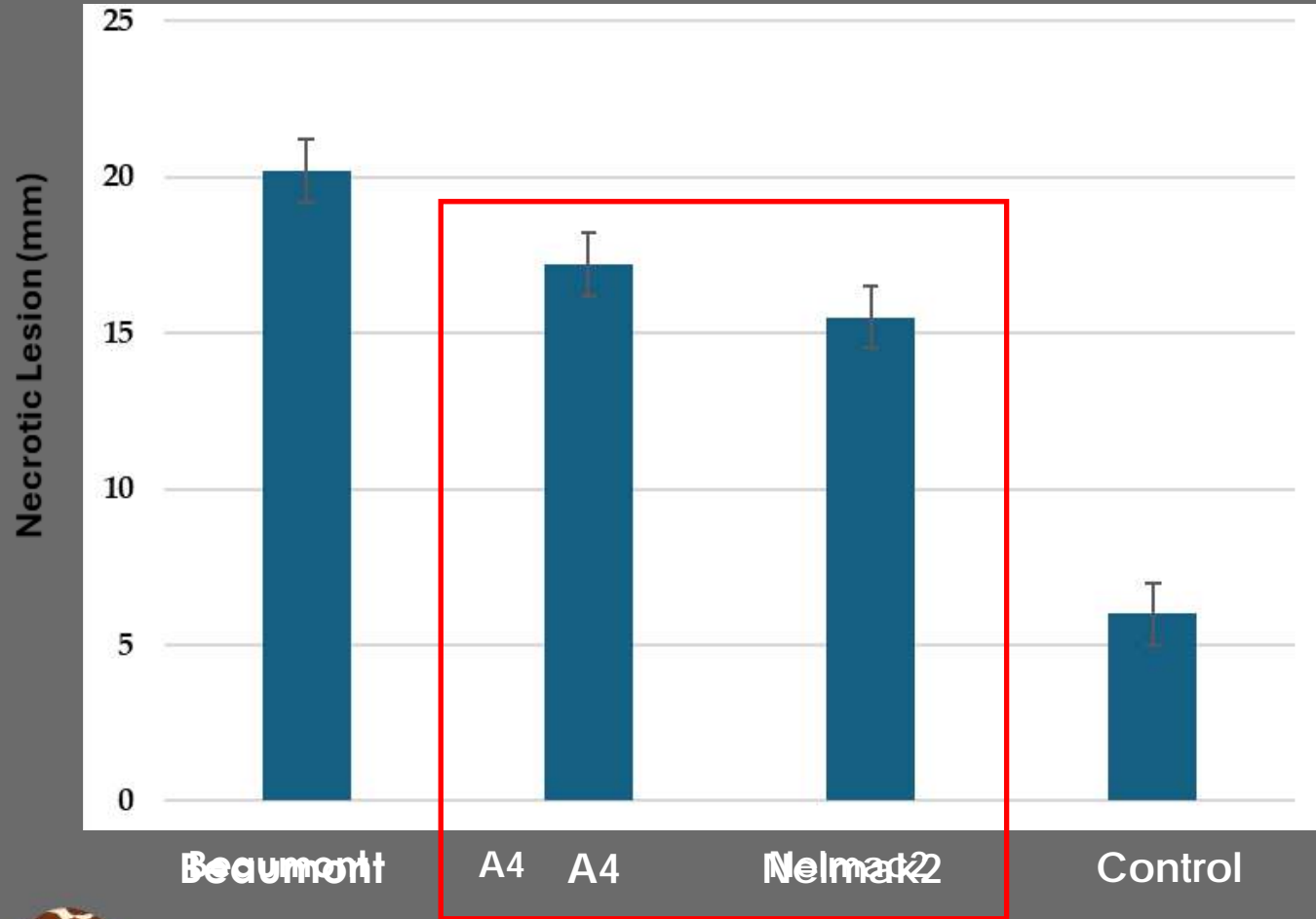


# Pathogenicity





# Tolerant & susceptibility of different varieties



Beaumont



Nelmac2



Control





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# Evaluating Fungicides





# In vitro

Commercial Fungicides	Active ingredients	C1*	C2	C3	C4	Fungicide/Water**
F1	Azoxystrobin + Difenconazole	0.25ml	0.5ml	0.75ml	1ml	0.5ml/1L
F2	Propiconazole + Cyproconazole	1ml	2.5ml	5ml	7.5ml	2.5ml/1L
F3	Chlorothalonil	1ml	2.5ml	5ml	7.5ml	2.5ml/1L
F4	Adepidyn™ + Difenconazole	1ml	2.5ml	5ml	7.5ml	2.5ml/1L
F5	Adepidyn™ + Azoxystrobin + Propiconazole	2.5ml	5ml	7.5ml	10ml	5ml/1L
F6	Mefenoxam + Chlorothalonil	2.5ml	5ml	7.5ml	10ml	5ml/1L
F7	Difenconazole	0.5ml	1ml	1.5ml	2ml	1ml/1L
F8	Cyprodinil + Fludioxonil	2.5g	5g	7.5g	10g	5g/1L
F9	Propiconazole	0.5ml	1ml	1.5ml	2ml	1ml/1L
F10	Bixafen	2.5ml	5ml	7.5ml	10ml	5ml/1L
F11	Tebuconazole	0.8ml	1.2ml	1.6ml	2ml	1ml/1L
F12	Bixafen + Prothioconazole	2.5ml	5ml	7.5ml	10ml	5ml/1L
F13	Fluopyram + Tebuconazole	100ul	200ul	300ul	400ul	0.2 mL/1L
F14	Fluopyram + Trifloxystrobin	100ul	200ul	300ul	400ul	0.20 mL/1L

14 Fungicides x 4  
concentration x 10 isolates x  
3 replication + 140 control =  
1820



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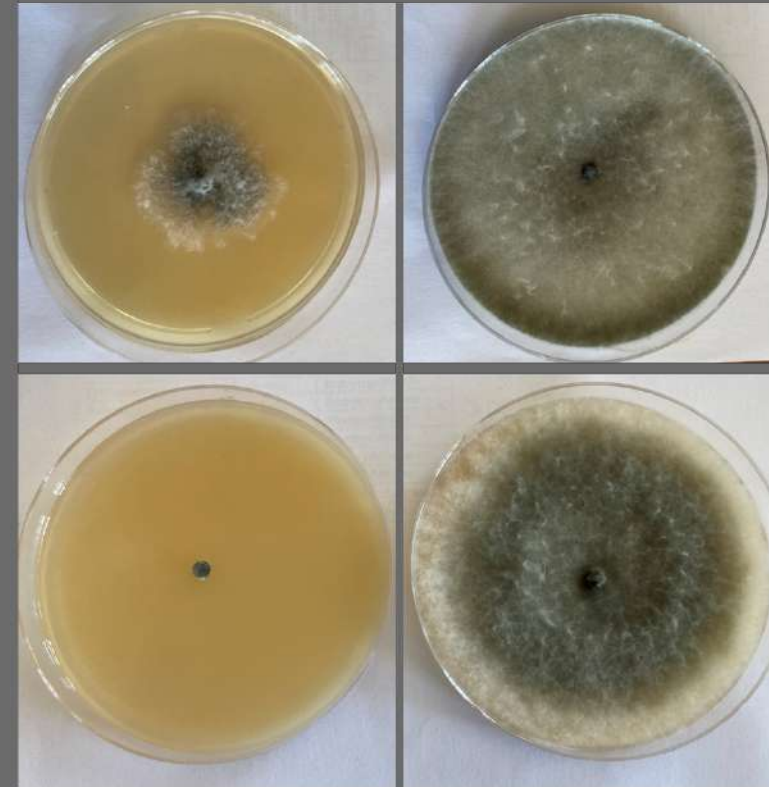


# In vitro

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F5	Adepidyn™ + Azoxystrobin + Propiconazole	2.5ml	5ml	7.5ml	10ml	5ml/1L
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Fungicide

No fungicide

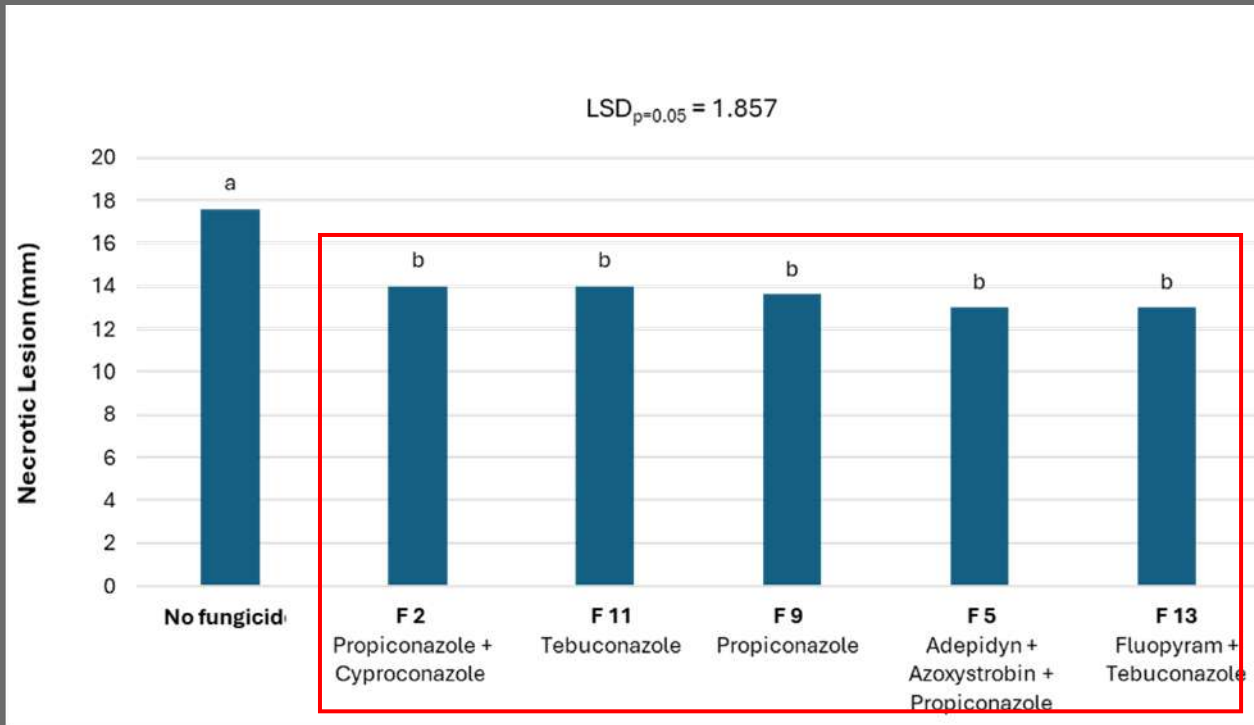


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# In vitro



F2



F9



None Fungicide



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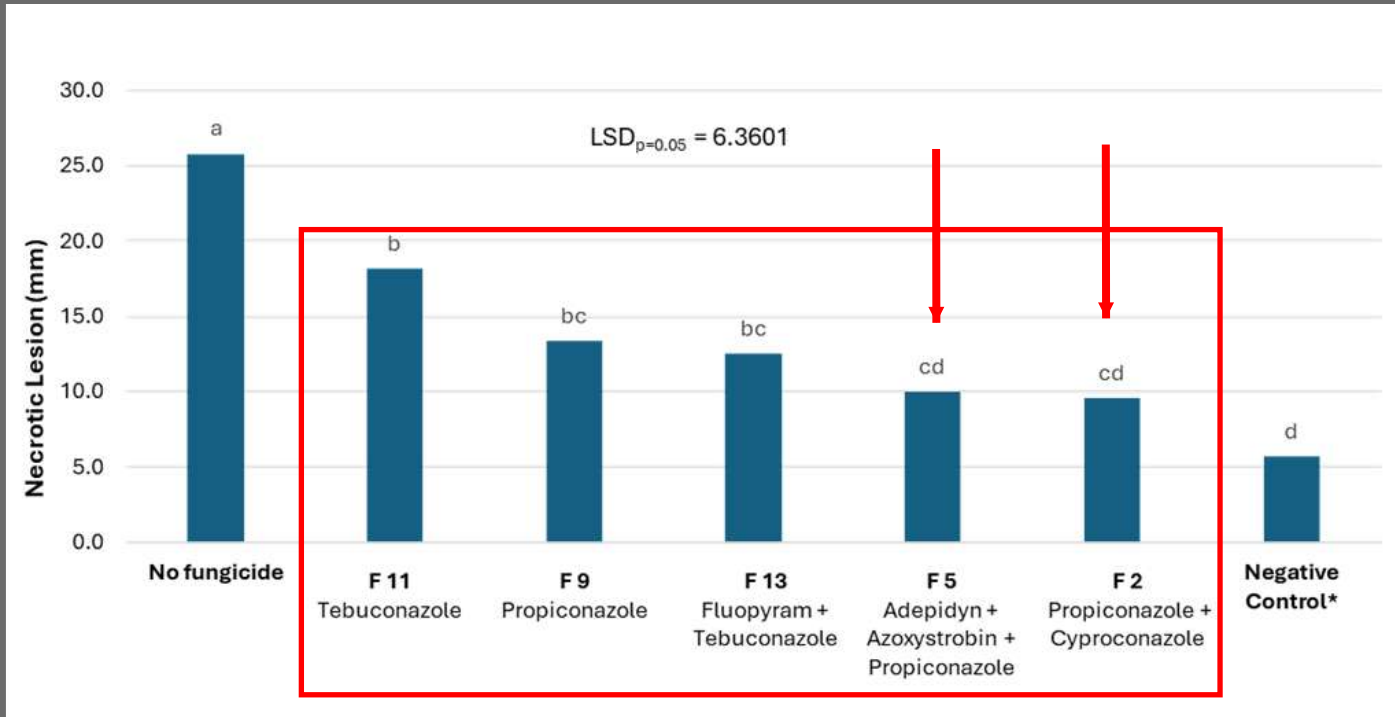


# Field





# Field



F2



F9



None Fungicide









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# Track the mode of introduction of *Botryosphaeriaceae* & *Diaporthaceae* into the orchards





# Nurseries



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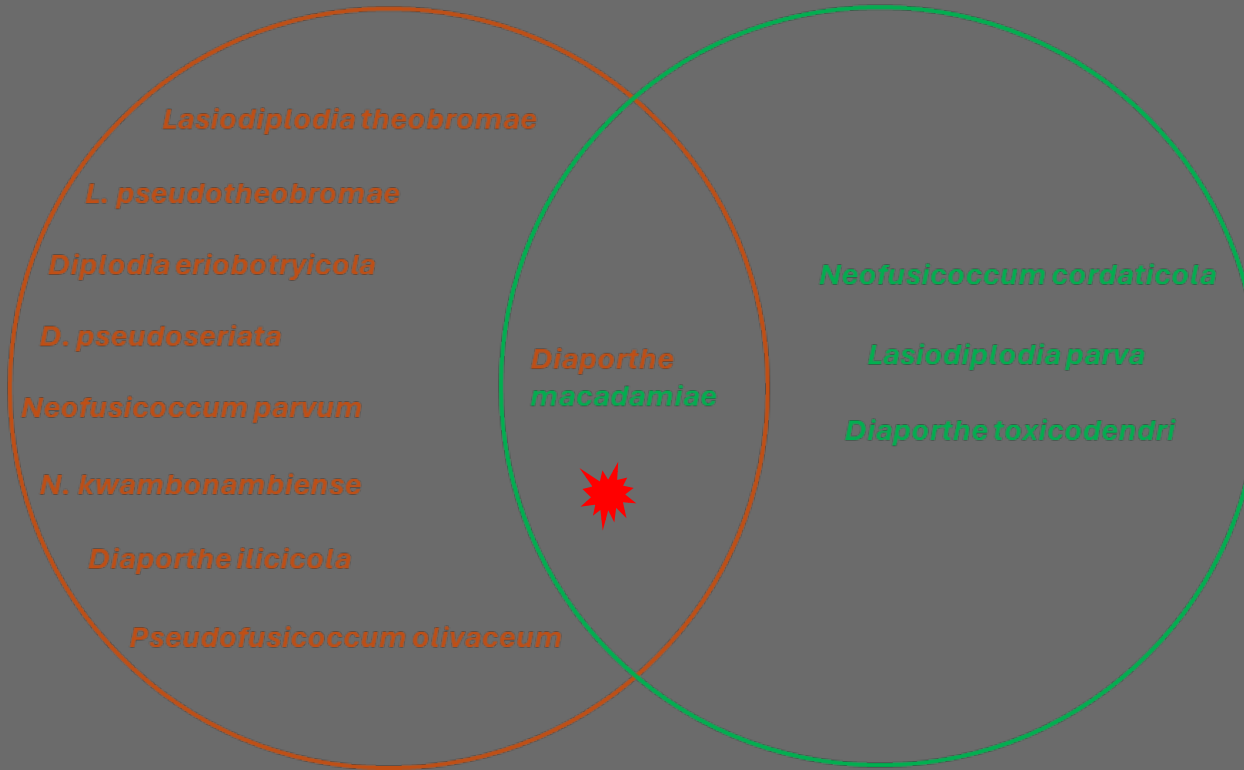


# Nurseries



Trees in orchards (Dieback)

Tree in nurseries (Healthy)



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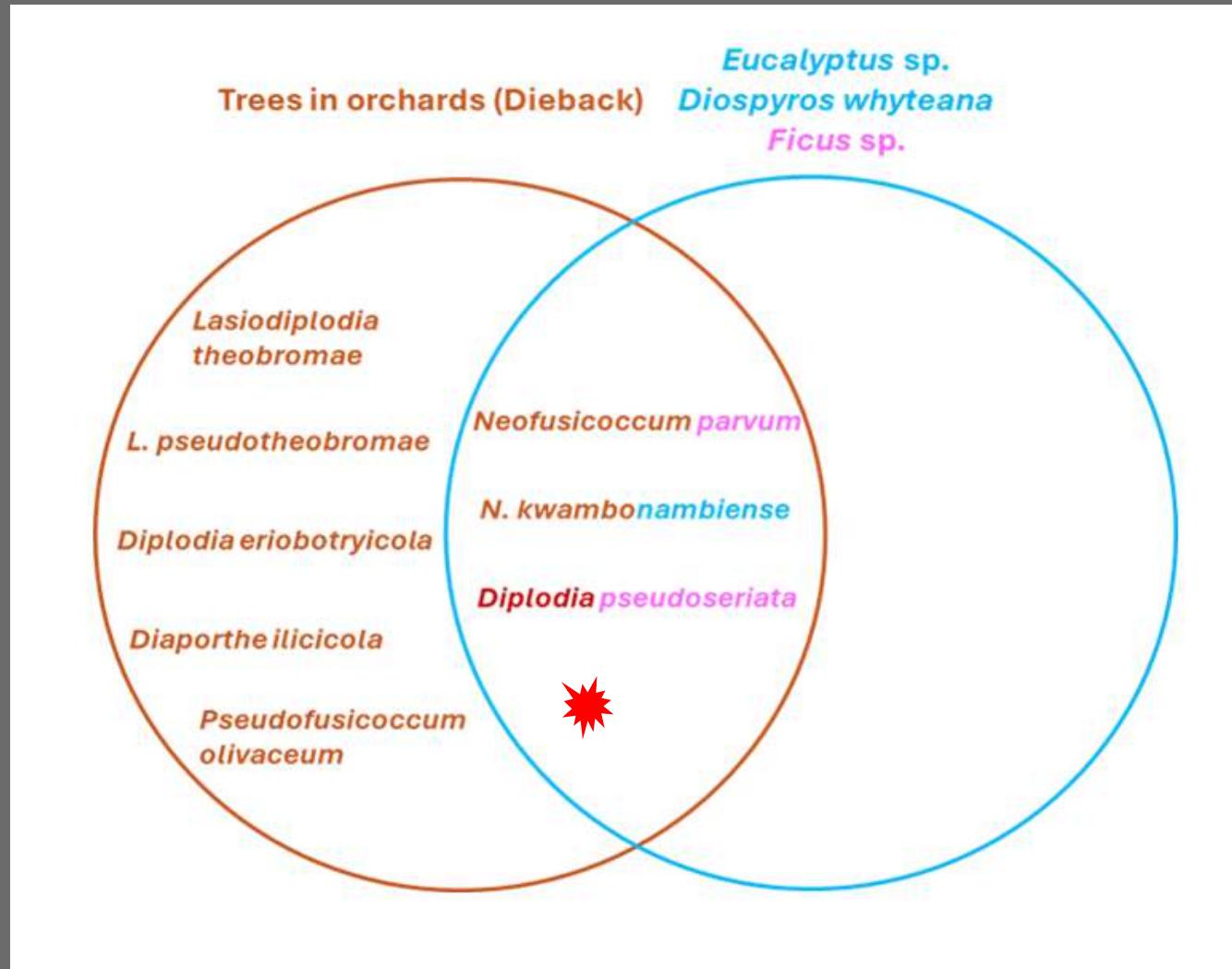


# Common woody plants growing in close by the orchards





# Common woody plants growing in close by the orchards



*Diospyros whyteana*



*Dombeya* sp.



*Gerrardina foliosa*



*Psidium guajava*



*Eucalyptus* sp.



# Conclusions

- **Nine species** were associated the cause of dieback, one species (*Lasiodiplodia thoebromae*) was the most virulent.
- **Nelmak2** and **A4** produced significantly **shorter lesions** compared to **Beaumont**.





# Conclusions

❖ **Four** species (*Botryosphaeriaceae* & *Diaporthaceae*) were identified from trees in the **nurseries**. *Diaporthe macadamiae* was the common species between trees in **orchards** and **nurseries**.

❖ **Three** *Botryosphaeriaceae* species were from surrounding trees, *N. kwambonambiense* and *N. parvum* were common between trees in **orchards** and **surrounding** trees.





# Conclusions

• Four fungicides with the active ingredients:

- Propiconazole
- Propiconazole + Cyproconazole
- Adepidyn + Azoxystrobin + Propiconazole
- Tebuconazole
- Fluopyram + Tebuconazole





# Take-home message:

Improve Orchard Hygiene

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# Take-home message:

Improve Orchard Hygiene

Monitor for Symptoms

Choose less susceptible

Use Effective Fungicides

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Thank you

