



DO GRAPEVINE TRUNK DISEASE PATHOGENS INCREASE WITH ROOTSTOCK MOTHER VINE AGE?

**Wynand J. van Jaarsveld, Lizel
Mostert, Jacobus J. Hunter, Minette
Havenga, Francois Halleen**

29 November 2023

GRAPEVINE TRUNK DISEASES



PETRI DISEASE



ESCA



BOTRYOSPHERA DIEBACK



EUTYPA DIEBACK



PHOMOPSIS DIEBACK



BLACK FOOT DISEASE



BACKGROUND

- GTDs negatively affect nursery vines at various stages during the propagation process, or later when vineyards are established
- Rootstock mother vines are known as sources of inoculum
 - Infection occurs through pruning wounds
 - Leads to buildup of pathogens
- Risks associated with ageing rootstock mother blocks unknown as infected rootstock canes often appear healthy

Mugnai *et al.* 1999. Plant Disease 83: 404–416.

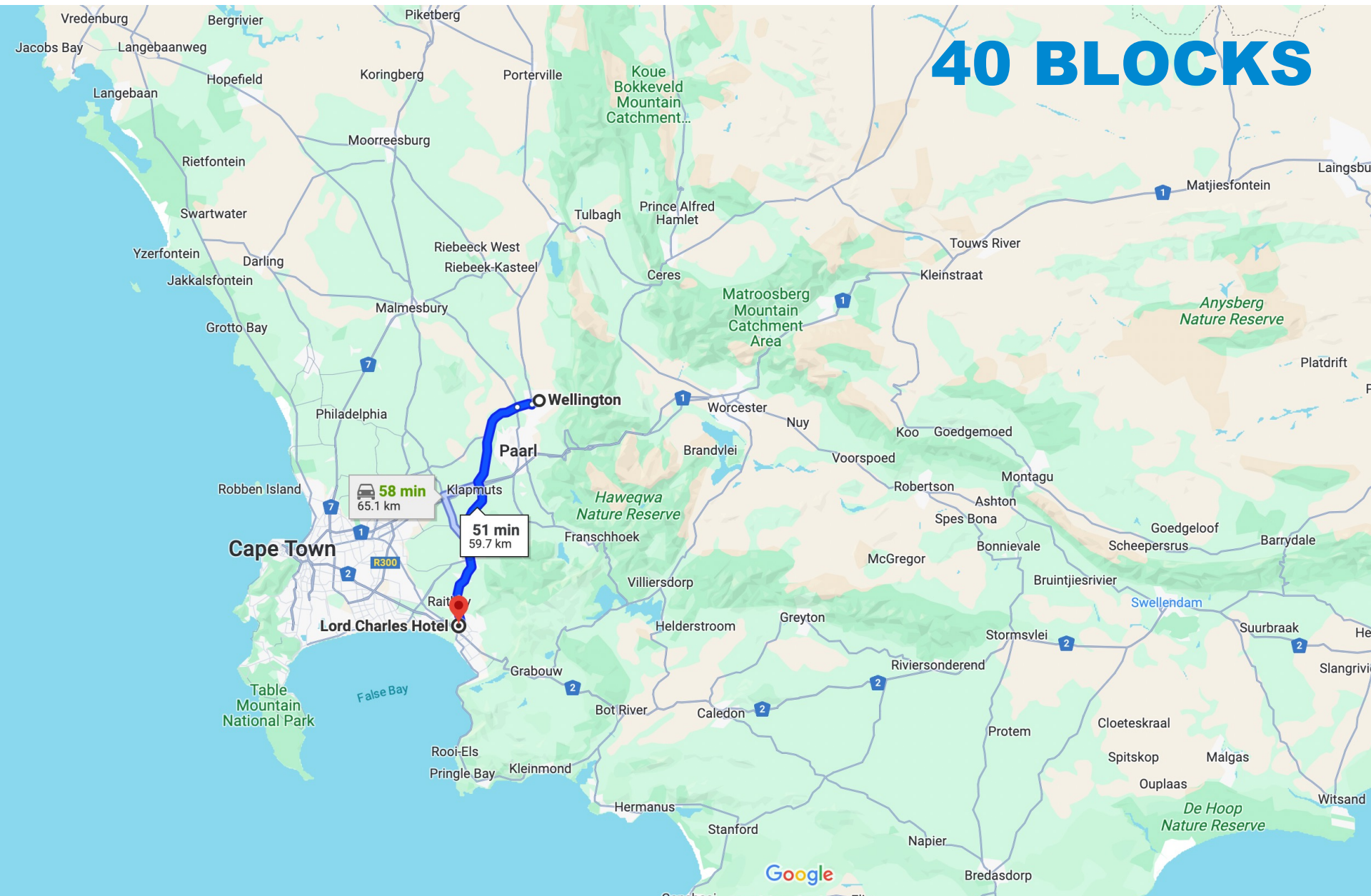
Eskalen and Gubler, 2001. Phytopathologia Mediterranea 40S: 429–432.

Gramaje and Armengol, 2011. Plant Disease 95: 1040–1055.



SURVEY LOCATION

40 BLOCKS



ONE-YEAR-OLD CANES



Cultivars at different ages

- SO4 SO332A
2011-2012
- US8-7 UC274A
2006-2008, 2012, 2014-2016



For 143B Block

- 5 zones randomly selected
- MGT101-14 AA2019F
- 1 cane per plant
- Paulsen PS28I
- 2008, 2009, 2011
- Ramsey SC18AB
- 2008, 2010, 2011, 2014, 2016
- Ramsey SC18AE
- 1999, 2003, 2007, 2014, 2017
- Richter 99 RY13C
- 2009, 2012, 2014
- Richter 110 RQ28C
- 2008, 2010, 2011, 2012, 2014
- Ruggeri RU354E
- 2010, 2014



qPCR (3 seasons)

Phaeomoniella chlamydospora

Diplodia seriata



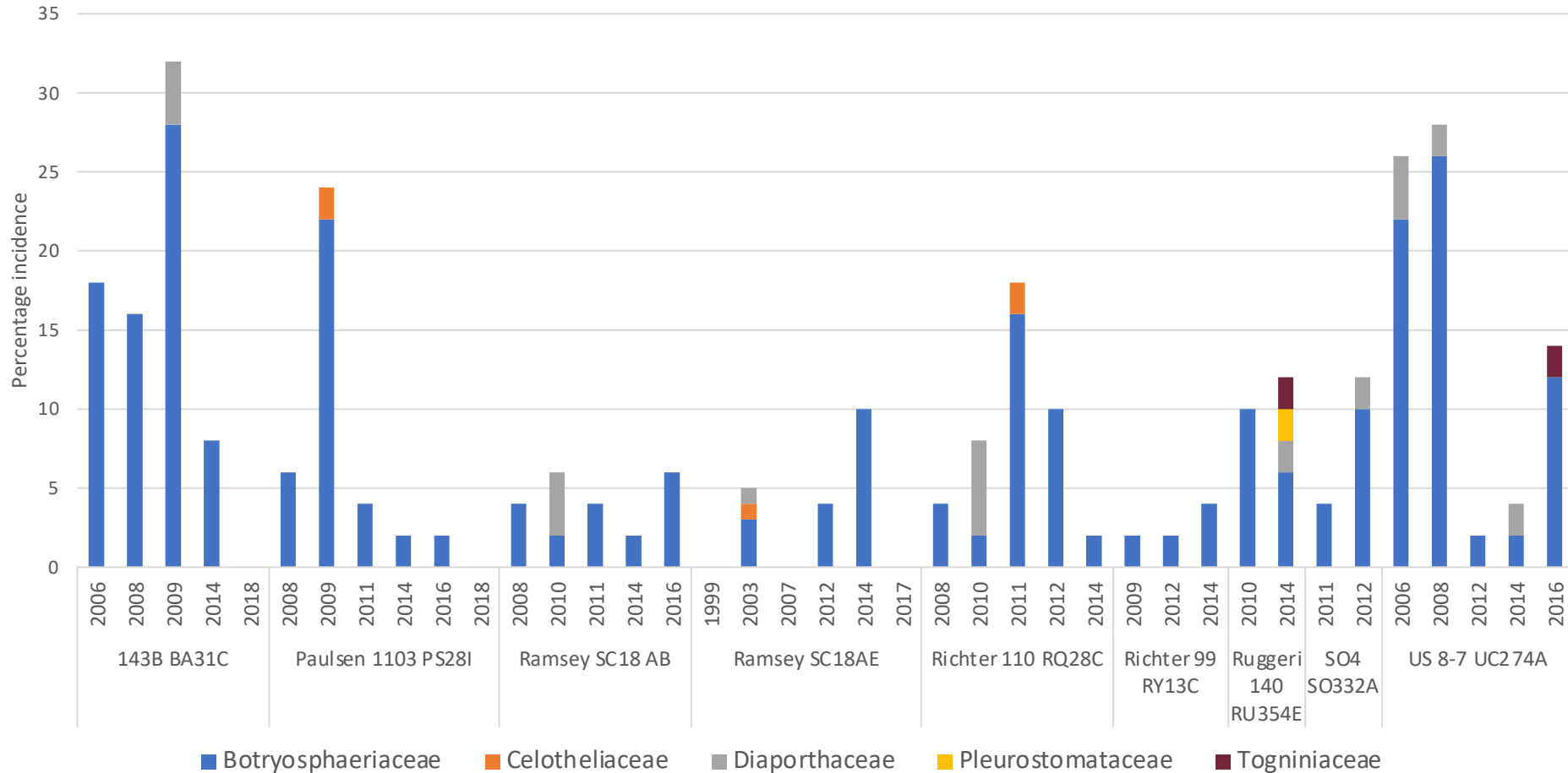
Isolations (1 season)

ONE-YEAR-OLD CANES



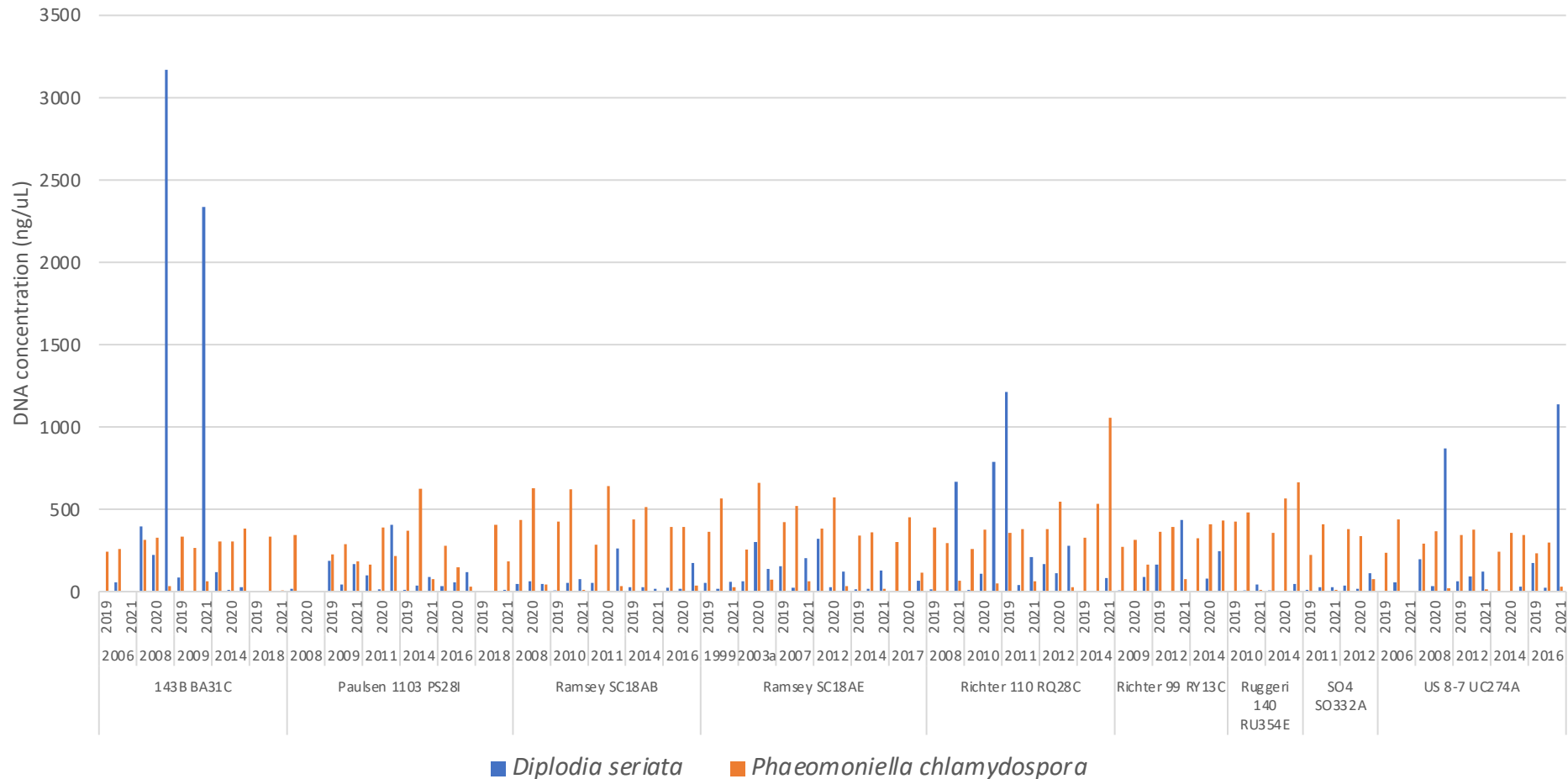
- Streaking in Richter 110 RQ28C (2012)

ISOLATIONS FROM CANES



- Botryosphaeriaceae were the main occurring GTD pathogens, followed by Celotheliaceae
- Few trends observed between canes from young versus old blocks

qPCR FROM CANES



- Incrementally higher positive samples in one-year-old canes than recorded with isolations
- Generally, irrespective of age

MOTHER VINE HEADS

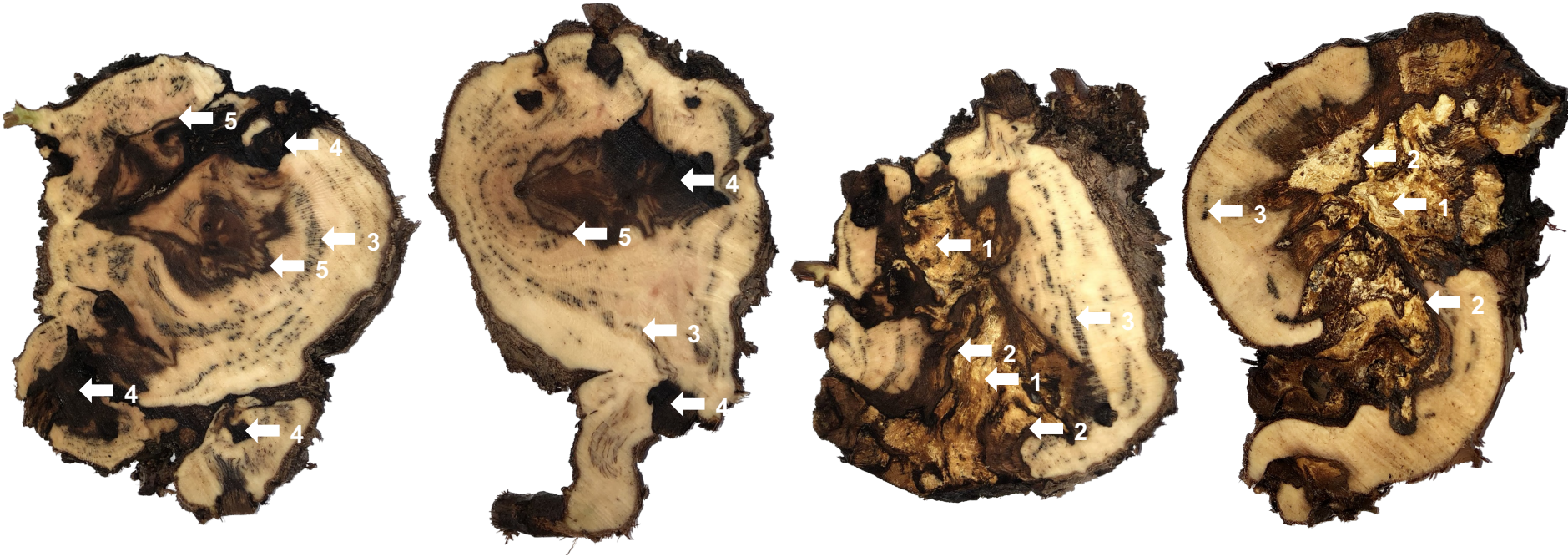


MOTHER VINE HEADS



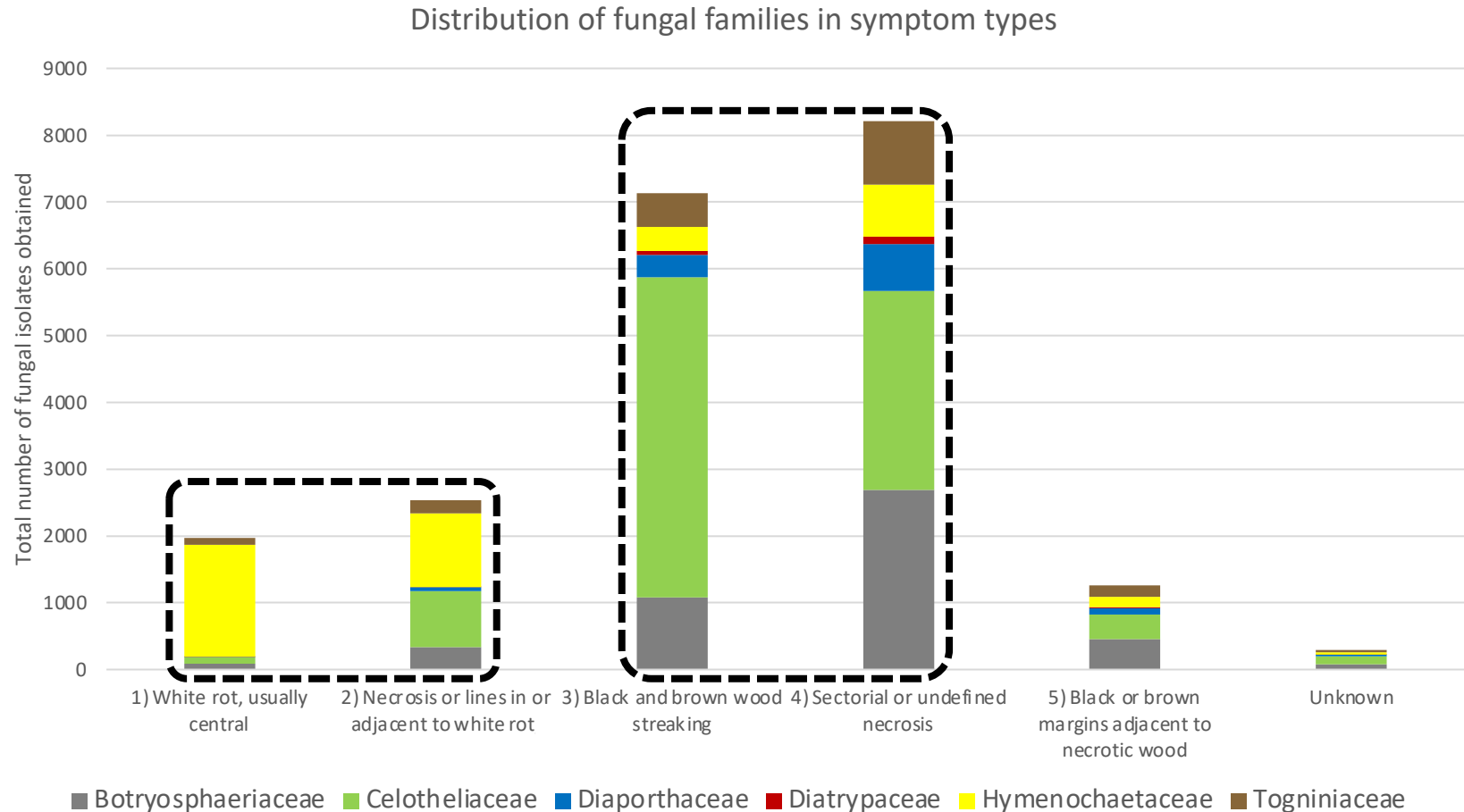
- E) Für die folgenden Jahre sind die Rücklagen (in Mio €) zu erwarten:

MOTHER VINE HEADS



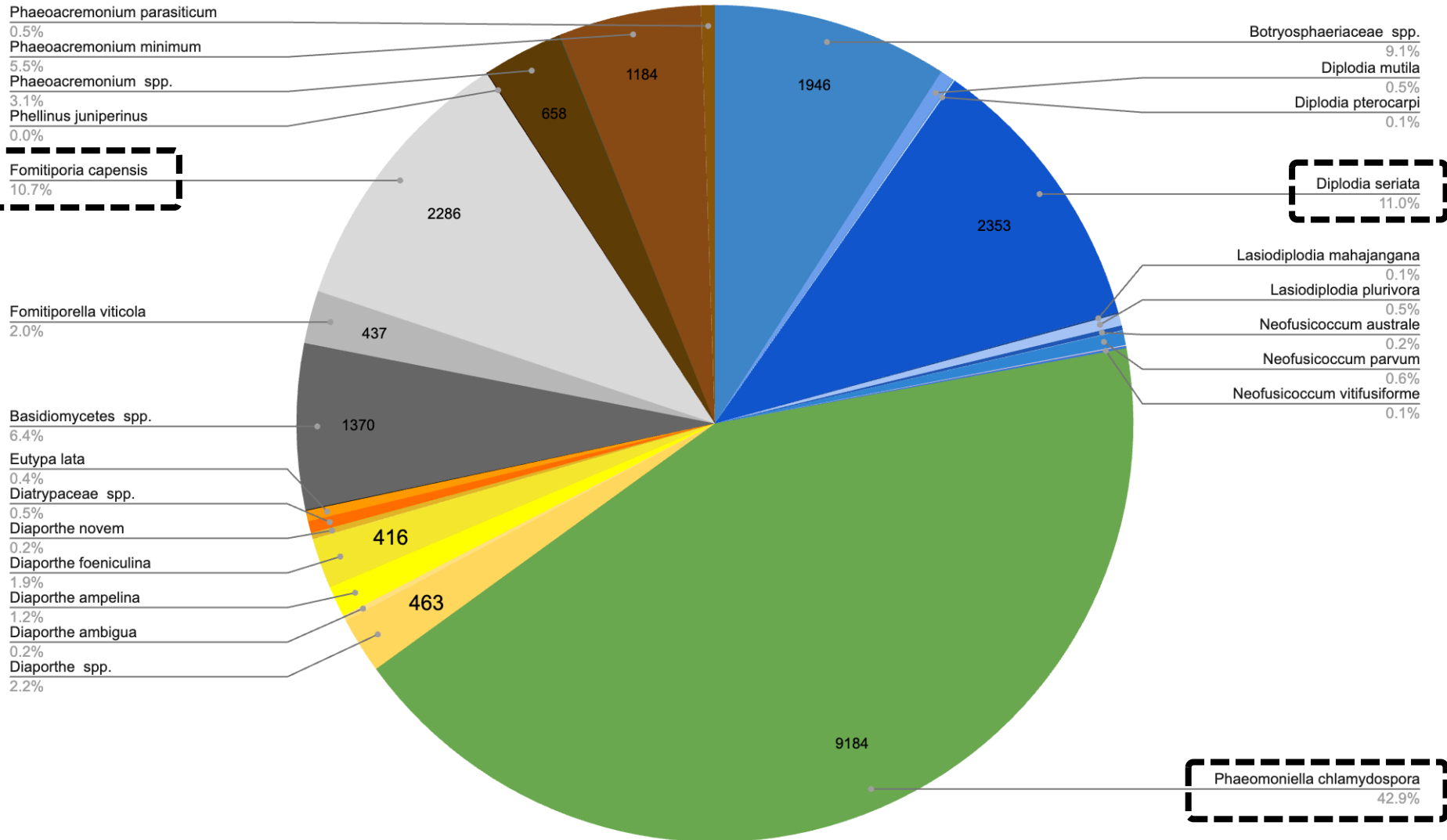
1. White rot, usually central
2. Black and brown necrosis or lines in or adjacent to white rot
3. Black and brown wood streaking
4. Sectorial or undefined necrosis
5. Black or brown margins adjacent to necrotic wood

MOTHER VINE HEADS

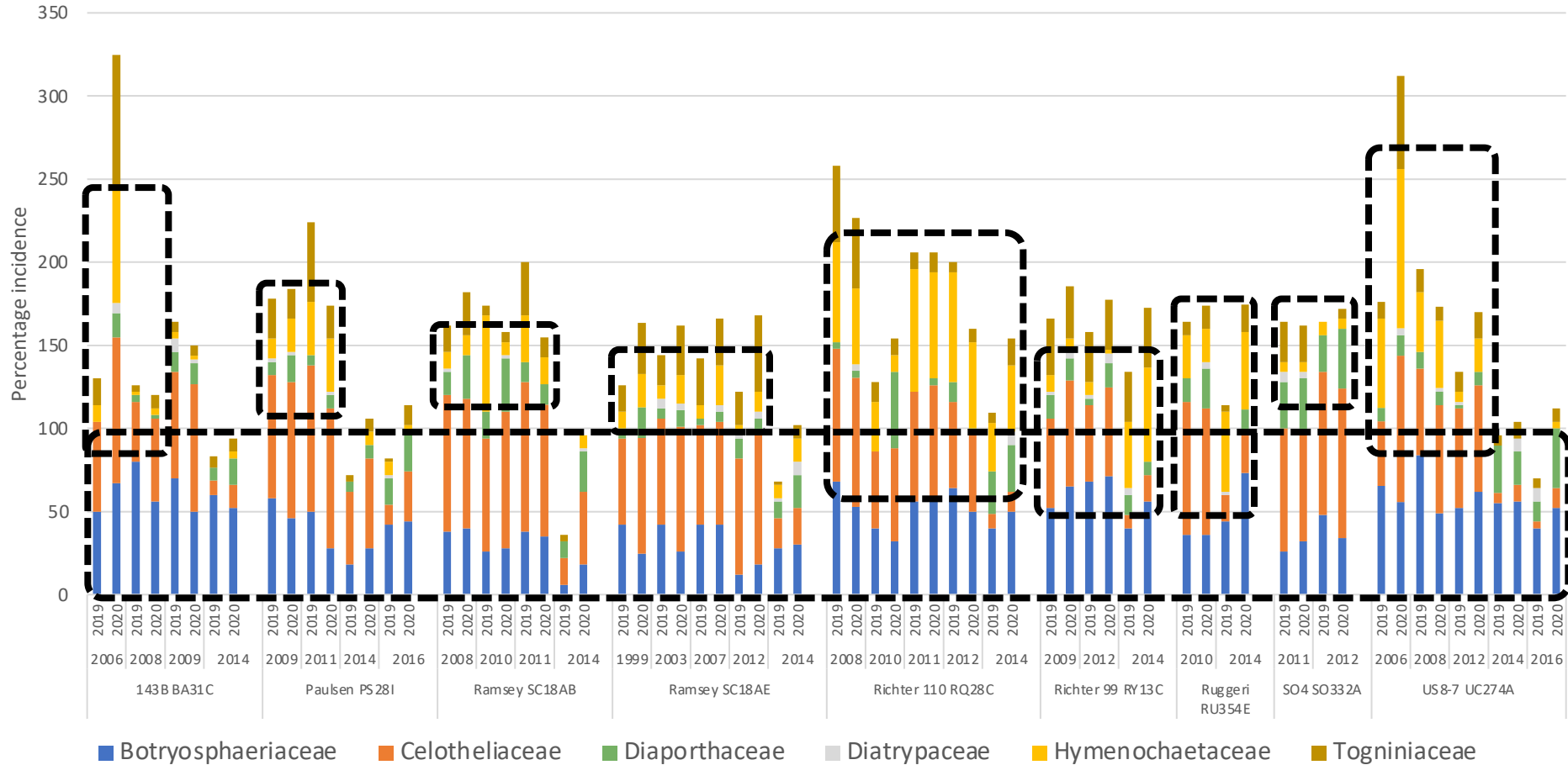


- ~~Generalized necrosis and Botryosphaeriaceae associated with white rot associated with white rot~~ not limited to it

MOTHER VINE HEADS



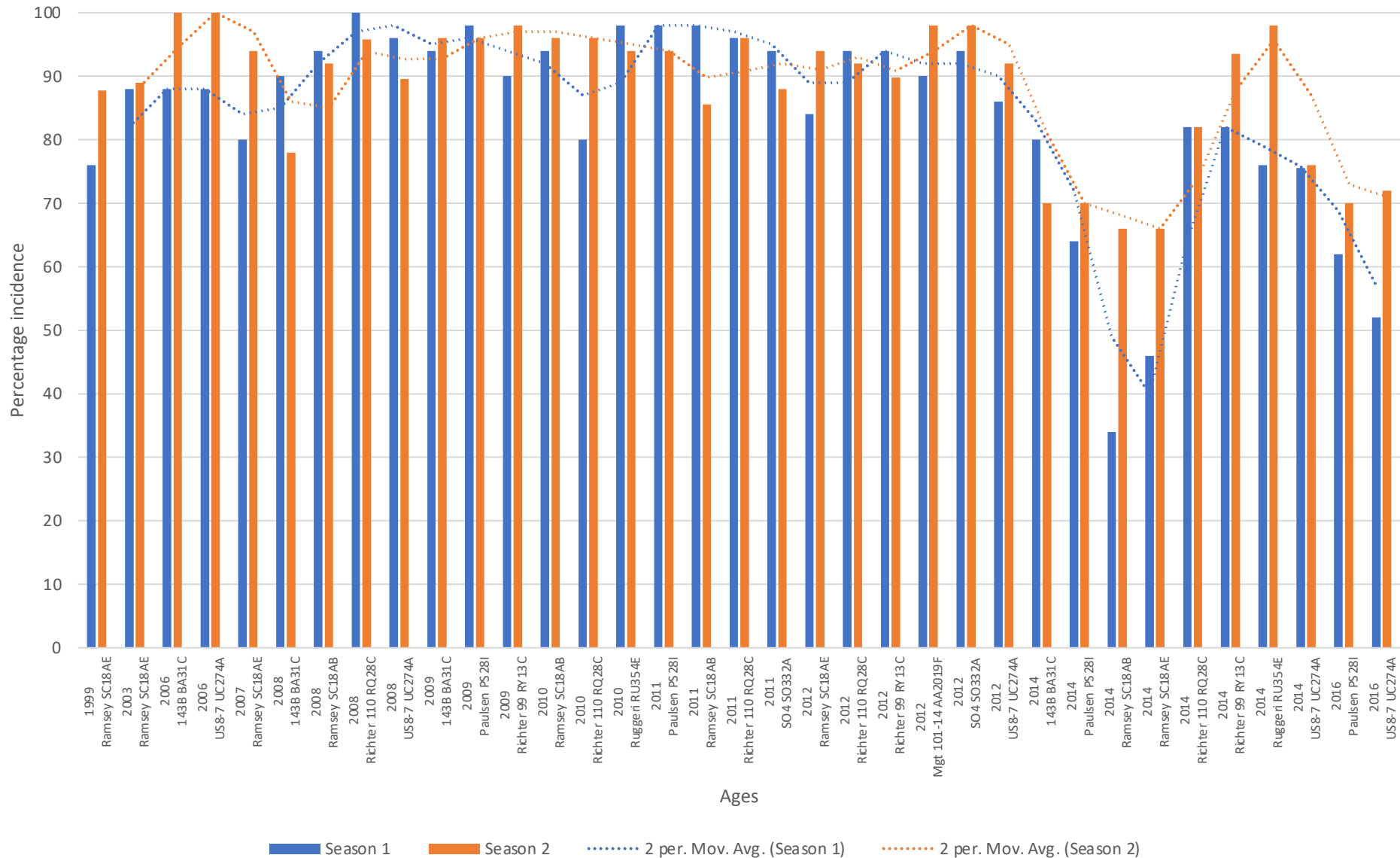
MOTHER VINE HEADS



- Both responses in the area generally associated with older, more frequent vines age

INCIDENCE ON AGE

Percentage incidence of all pathogens isolated from symptomatic heads of rootstock mother vines



- Negative correlation between incidence of DENV infection and Platelet counts, fibrinogen and D-dimer levels in symptomatic inoculum?



DISCUSSION

- Was not able to differentiate between rootstock mother blocks of different ages, except:
- Hymenochaetaceae resulting in white rot in older blocks
 - Mortality rates associated with the mean necrotic area of Ecsa
- *D. seriata* infection in the heads results in infected one-year-old canes
- Presence of *Pa. chlamydospora* in one-year-old canes likely ascribed to inoculum beneath bark

Liminana *et al.* 2009. Phytopathologia Mediterranea 48: 92–100.



TAKE-HOME MESSAGE

- Infected rootstock mother blocks results in contaminated one-year-old canes
 - Hot water treatment
 - Surface disinfectant
- Sanitation is crucial
 - Removal of fungal fruiting bodies
 - Removal of infected/dead vines
- Pruning wound protectants is crucial
 - Not currently implemented in SA (mother vines)
 - From first pruning of young blocks
 - Immediately after pruning



ACKNOWLEDGEMENTS



Stellenbosch

UNIVERSITY
IYUNIVESITHI
UNIVERSITEIT



ARC • LNR

Excellence in Research and Development



SOUTH AFRICA WINE

discover diversity in a glass



NRF

**National
Research
Foundation**