

# Phytophthora Brown Rot control

Jan van Niekerk, Lize vd Merwe and Cheryl Lennox





# Introduction

- 🍊 In South Africa, Phytophthora Brown rot is mainly caused by *Phytophthora nicotianae*.
- 🍊 The disease can occur in the orchard on low hanging fruit, or it can manifest postharvest during transit.
- 🍊 If occurring during transit, it could lead to secondary decay caused by *Penicillium* spp.





# Motivation

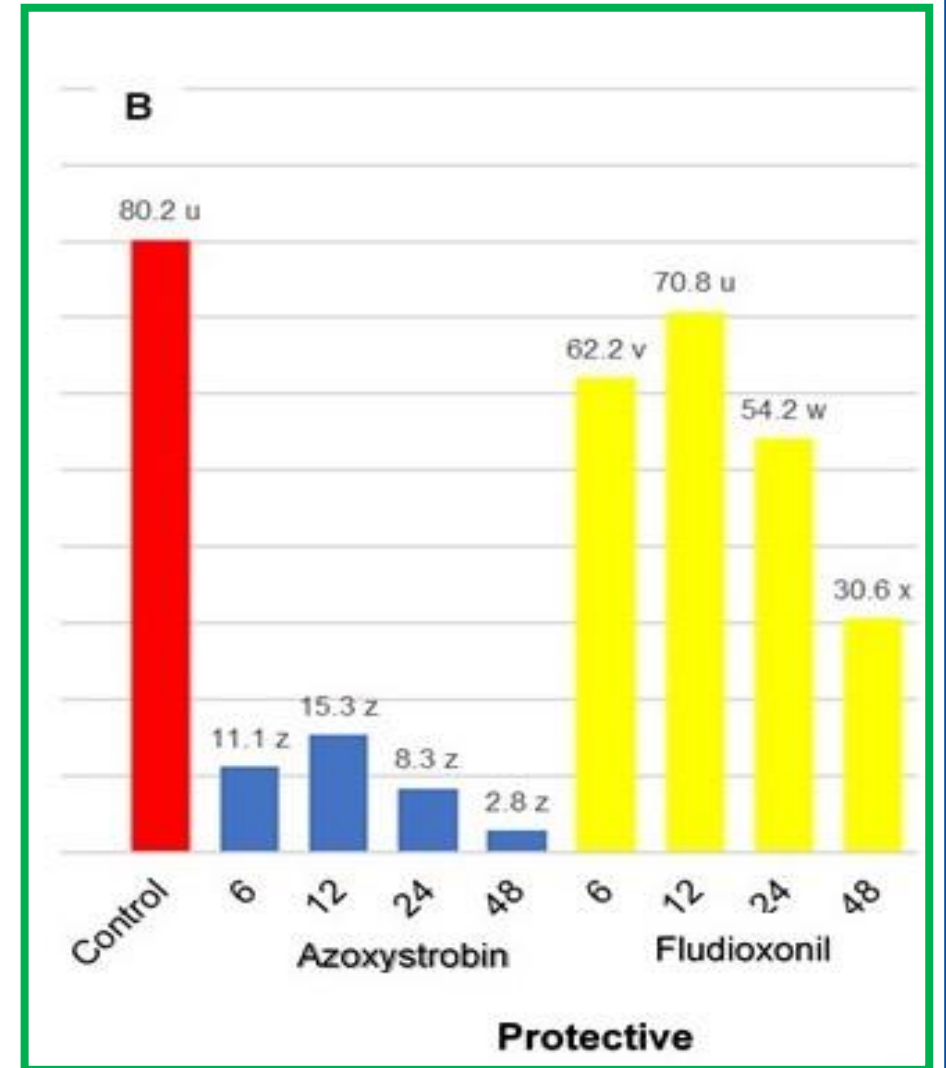
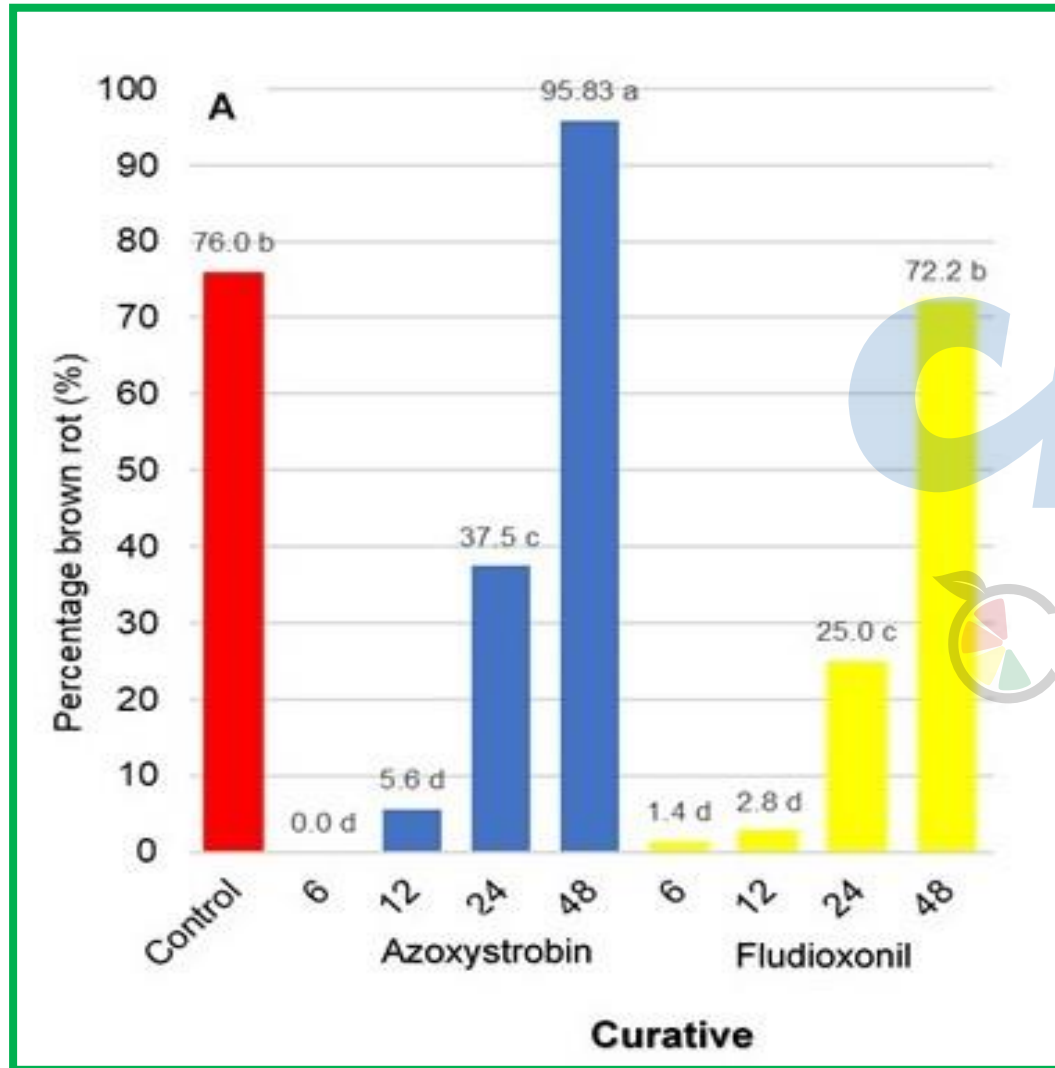
- Preharvest management of Phytophthora Brown rot is reliant on correctly timed fungicide sprays using phosphonates or contact fungicides such as copper or mancozeb.
- However, to date no fungicides were registered in South Africa for the postharvest control of this disease on citrus.
- **Aim:** To evaluate the efficacy of fludioxonil and azoxystrobin for the postharvest management of Phytophthora Brown Rot.



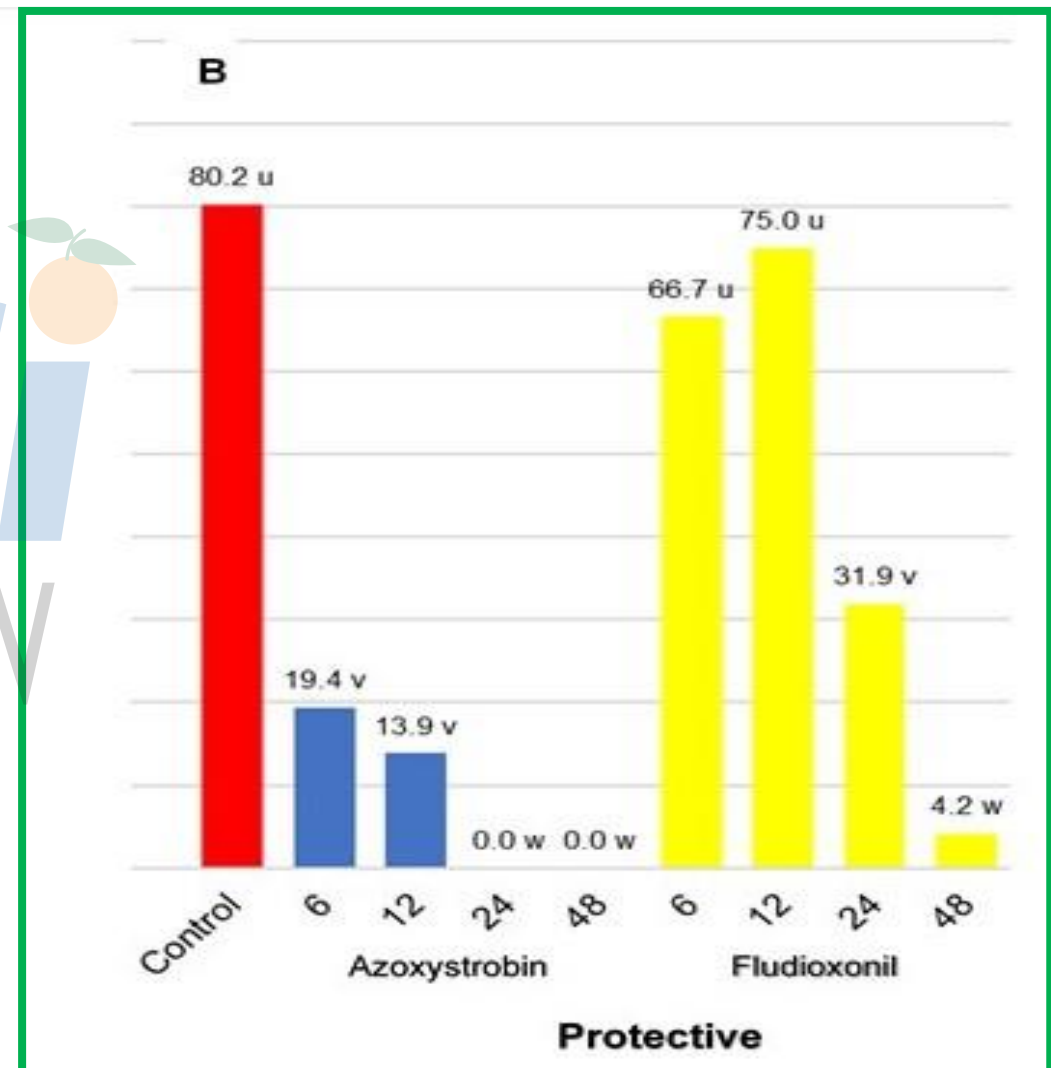
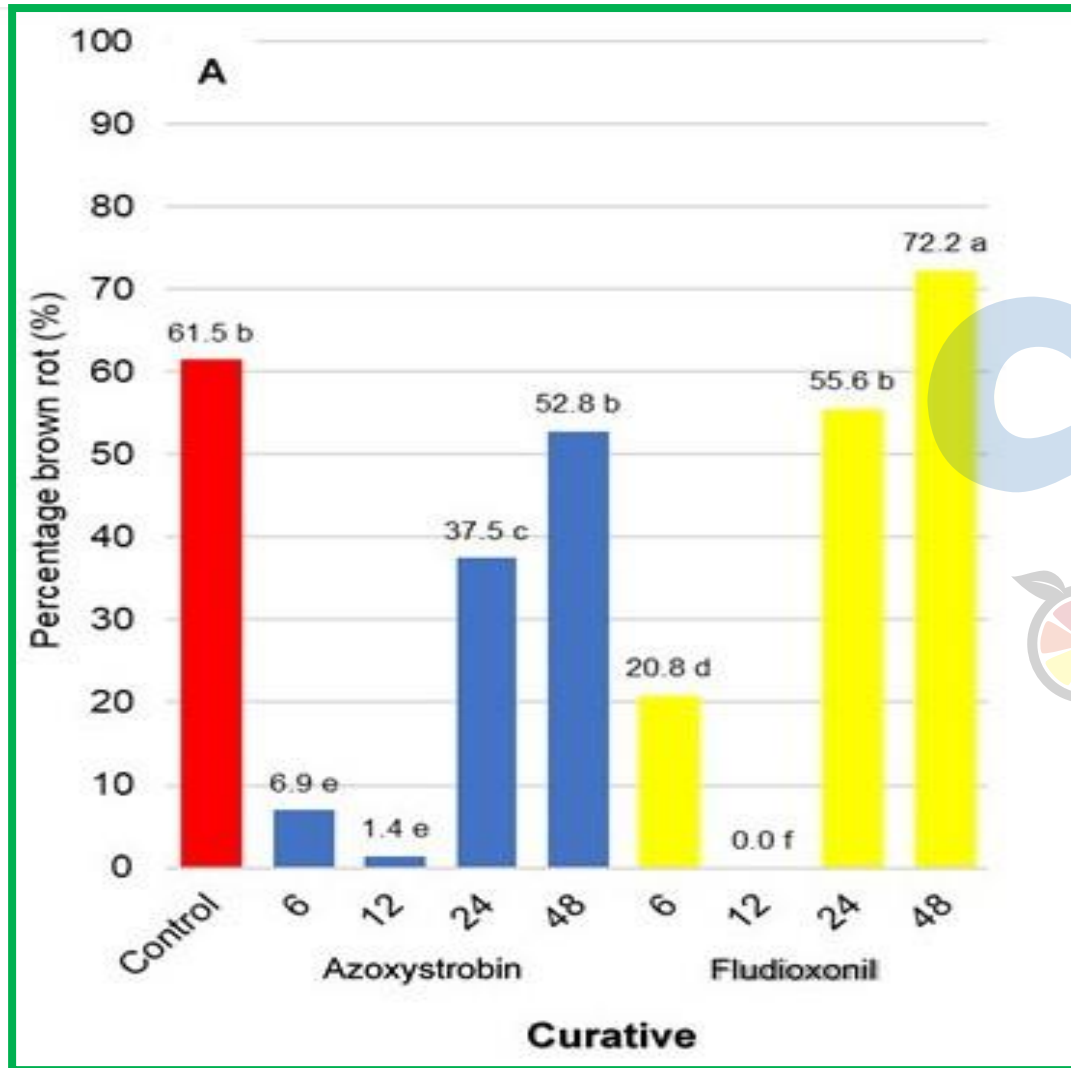
# Materials and methods

- Curative and protective action of fungicides determined.
- **Curative = inoculate fruit**, then treat fruit with fungicides 6, 12, 24 and 48 hr **after** inoculation
- **Protective** = treat fruit with fungicides, then **inoculate** fruit 6, 12, 24 and 48 hr **after** treatment
- In all trials fruit rated 5-7 days after inoculation. Incubation done at 29°C
- Trials repeated on lemons, oranges and mandarins.

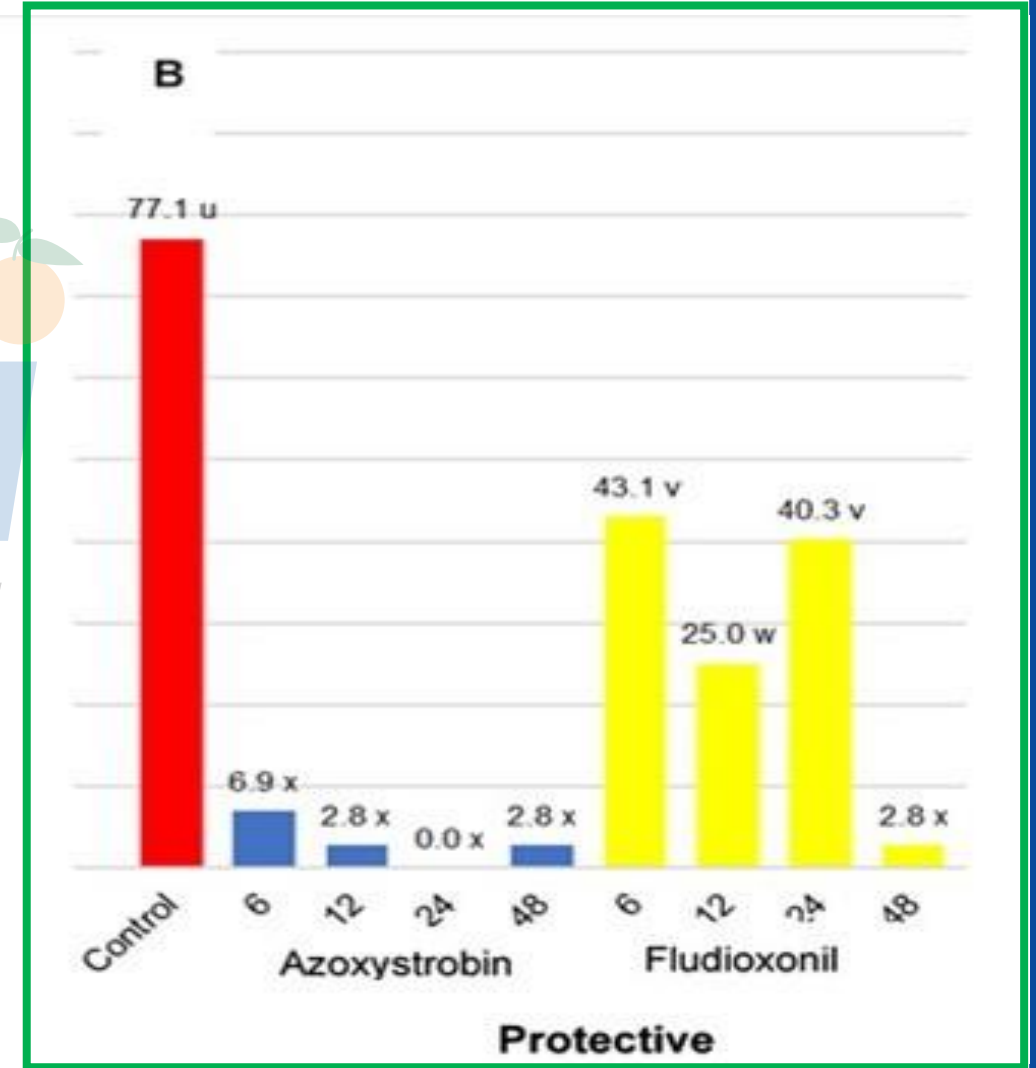
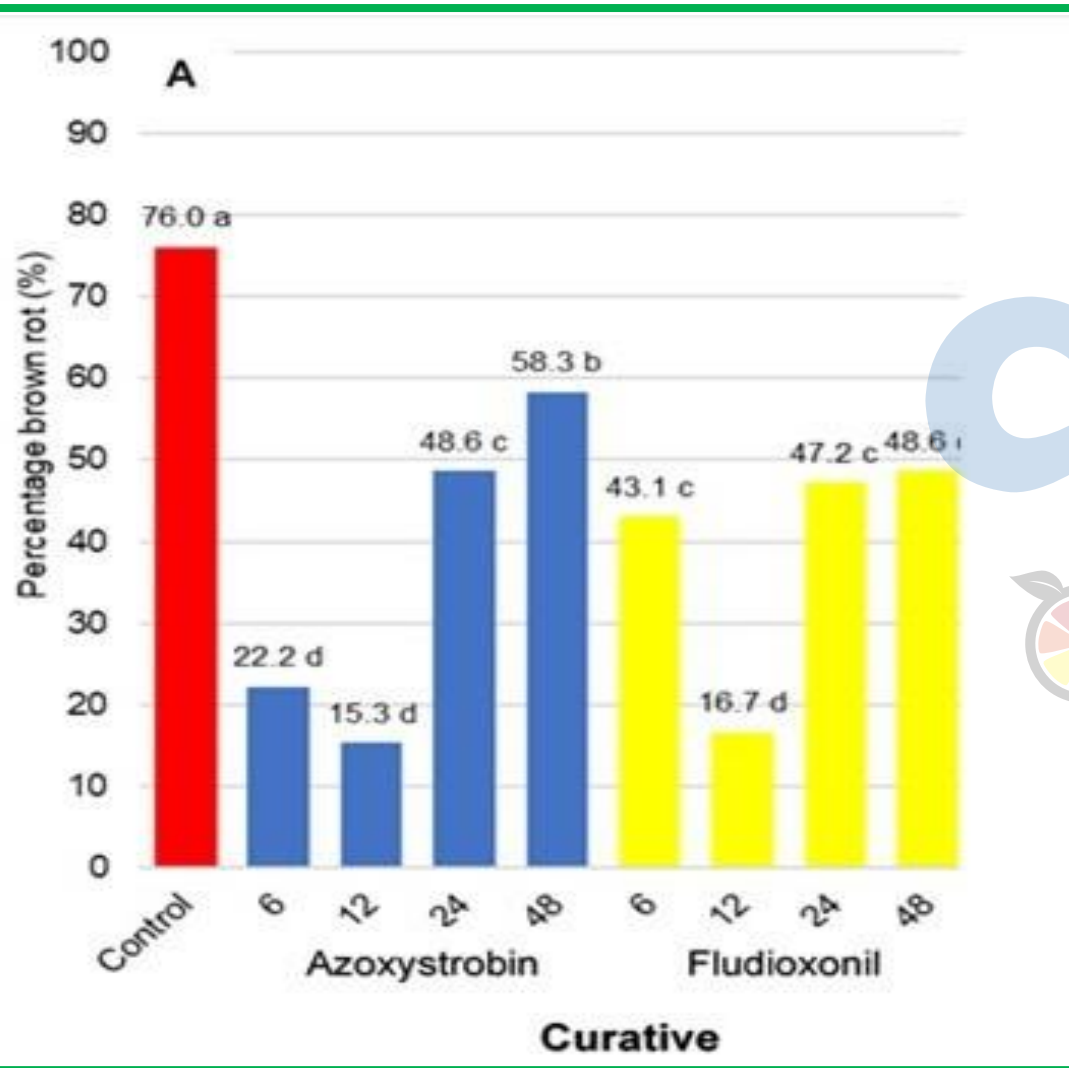
# Results - lemons



# Results - oranges



# Results - mandarins





# Conclusions

- On lemons and oranges, the curative control obtained by azoxystrobin and fludioxonil was very good up to 12hr after inoculation and acceptable up to 24hr after treatment.
- However, on mandarins only azoxystrobin provided good control up to 12hr, but at 24 and 48 hr control was poor.
- In terms of protective control, only azoxystrobin provided consistent control up to 48hr after fungicide treatment.
- Based on these results, both fungicides are in the process of registration for Brown Rot control.



# Recommendations for Brown Rot control

- 🍊 Preharvest – use properly timed fungicide sprays.
  - 🍊 Fosfonates – 2-3 weeks before harvest, note the 14 d PHI
  - 🍊 Do not apply phosphonates on mandarins that are at full color
  - 🍊 Copper oxychloride – 3 weeks before harvest, 14 d PHI
  - 🍊 Mancozeb – 3 weeks before harvest, PHI – note requirements for specific markets
- 🍊 At harvest
  - 🍊 Do not pick fruit that have visual Brown Rot symptoms
  - 🍊 Do not pick fruit in the bottom 1m of the canopy



# Recommendations for Brown Rot control

- Postharvest— based on the presented results, once registered, the two tested fungicides can be applied postharvest as follow for Brown Rot control
  - If fruit are suspected to be infected, apply azoxystrobin or fludioxonil within 24hr after suspected infection in the orchard.
  - In order to protect fruit against possible Brown rot infection during transit, treat fruit with azoxystrobin.



# Acknowledgements

- The authors wish to thank the following people for funding, facilities and technical assistance
  - Citrus Research International
  - Department of Plant Pathology, University of Stellenbosch
  - Postharvest Innovation Fund of the Department of Science and Innovation