



# Kiwifruit Fungal Pathogens

KiwiNet Dec 2017

Matt Dyck

# Workshop Purpose



Identify research priorities for:

1. Verticillium wilt
2. Phytophthora sp.
3. Brazilian wilt (*Ceratocystis fimbriata*)
4. Other emerging risks



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# Understanding Verticillium wilt on kiwifruit in Chile, to prevent its introduction and spread to New Zealand

**Joel Vanneste & Bob Fullerton**

**Mount Maunganui 09 November 2017**





**2006**  
**(Planted 2003)**



**2008**





**2009**





Healthy plant



Diseased plant

# Research priorities - Verticillium



1. Identify what we have in New Zealand
2. Confirm ID of Verticillium in Chile
3. Use the outcomes of the above to develop diagnostic tools





# *Phytophthora*

## Why should we be concerned

Beccy Ganley, Scion





# *Phytophthora cinnamomi* – over 2500 known hosts





# *Phytophthora ramorum*

- over 100 known hosts





# New species, new diseases - increased risk?



- Substantial increase in new number of new *Phytophthora* species over last 15 years
- Rise in number of new diseases or behaviour changes





*The real threat to kiwifruit is the introduction of new and potentially more aggressive Phytophthora species or strains, which may be more damaging to kiwifruit **even on good soils**. We don't even know what these species are yet, but given the appearance of so many new & aggressive Phytophthoras in all sorts of systems in recent years, the risk is real. So I guess vigilance regarding what's appearing internationally, and good biosecurity is key.*

Ian Horner (PFR)



# Brazilian wilt (*Ceratocystis fimbriata*)



- Over \$200k in R&D already
- Second round of research to include;
  - Pathogenicity screening (non-Brazil strains & G3)
  - Epidemiology – lag period
  - Refining diagnostics
  - Refining response plans



# On-orchard practices ALL the time...



## Genetic variability suggests that three populations of *Ceratocystis fimbriata* are responsible for the Ceratocystis wilt epidemic on kiwifruit in Brazil

Maria A. Ferreira<sup>1</sup> • Thomas C. Harrington<sup>2</sup> • Graziela Piveta<sup>3</sup> • Acelino C. Alfenas<sup>4</sup>

Brazil. The kiwifruit epidemic in Rio Grande do Sul is the southern-most report of *C. fimbriata* in Brazil, and the primary pathogen population on kiwifruit appears to be indigenous and originated from a single farm that distributed the pathogen in grafting material. In addition, commercial nursery stock was also implicated as sources of *C. fimbriata* genotypes. The disease is a major limiting factor for kiwifruit production in southern Brazil, and

Clade of the *C. fimbriata* complex are soilborne pathogens but can be readily introduced to new areas on contaminated tools and infected propagative material (Baker et al. 2003; CAB

Unfortunately, many of the local farmers had obtained planting stock from this farm before Ceratocystis wilt was recognized. Typical of epidemics of Ceratocystis wilt on other crops

Greater care needs to be taken in dispersing *C. fimbriata* in symptomless propagation material (Ferreira et al. 2011; Harrington 2013, 2014; Oliveira et al. 2015).



# Not an isolated case – a trend



- *Verticillium* wilt in Chile, *Phytophthora* in Forestry species & Kauri, Brazilian wilt in kiwifruit
- NOT biosecurity incursions, but native pathogens evolving or switching hosts
- We have plenty of native pathogens, could one of these be our next big threat?
- How do we stop the spread of the unknown?



