Vine Decline:

What we know, what we're learning, and how we're building our understanding of risk

Sonia Whiteman, Zespri and Erin Lane, KVH

KVDS – should we be worried?

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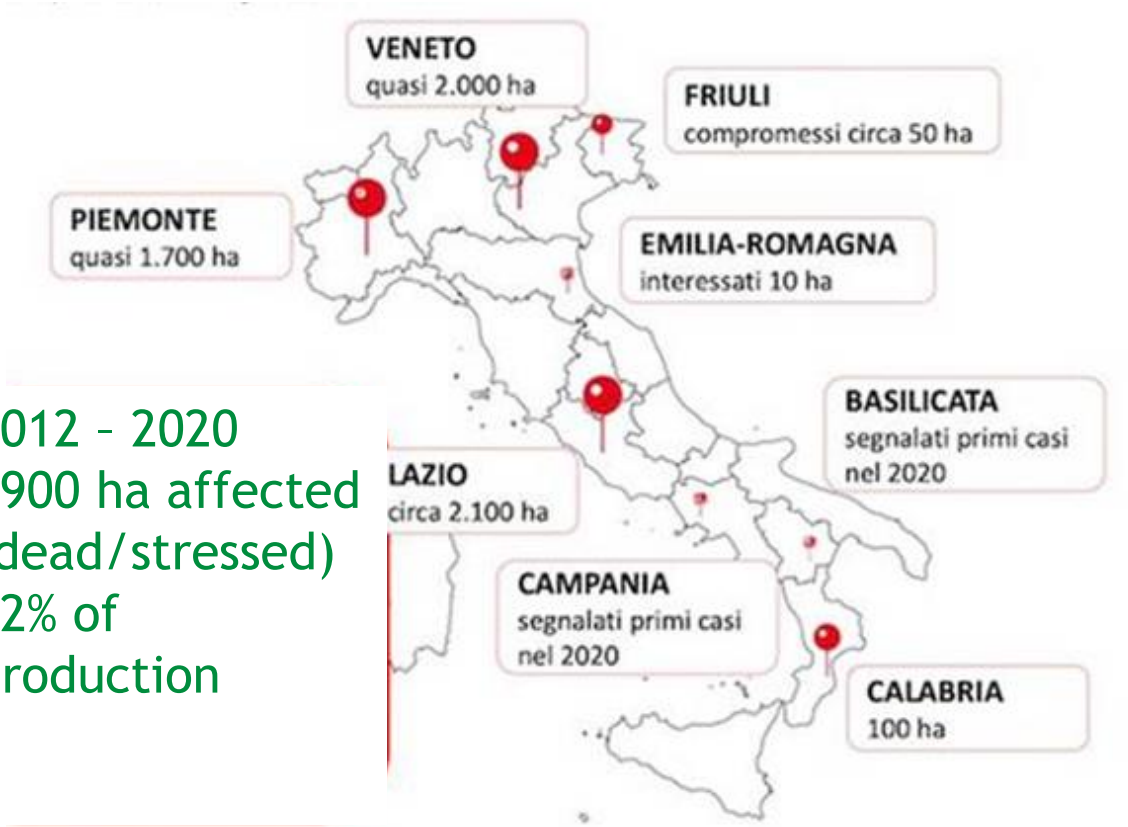
What is KVDS?

- 2012 decline & death of kiwifruit vines → ‘Verona vine decline’

→ La Moria → Kiwifruit Vine Decline Syndrome (KVDS)

Where is KVDS?



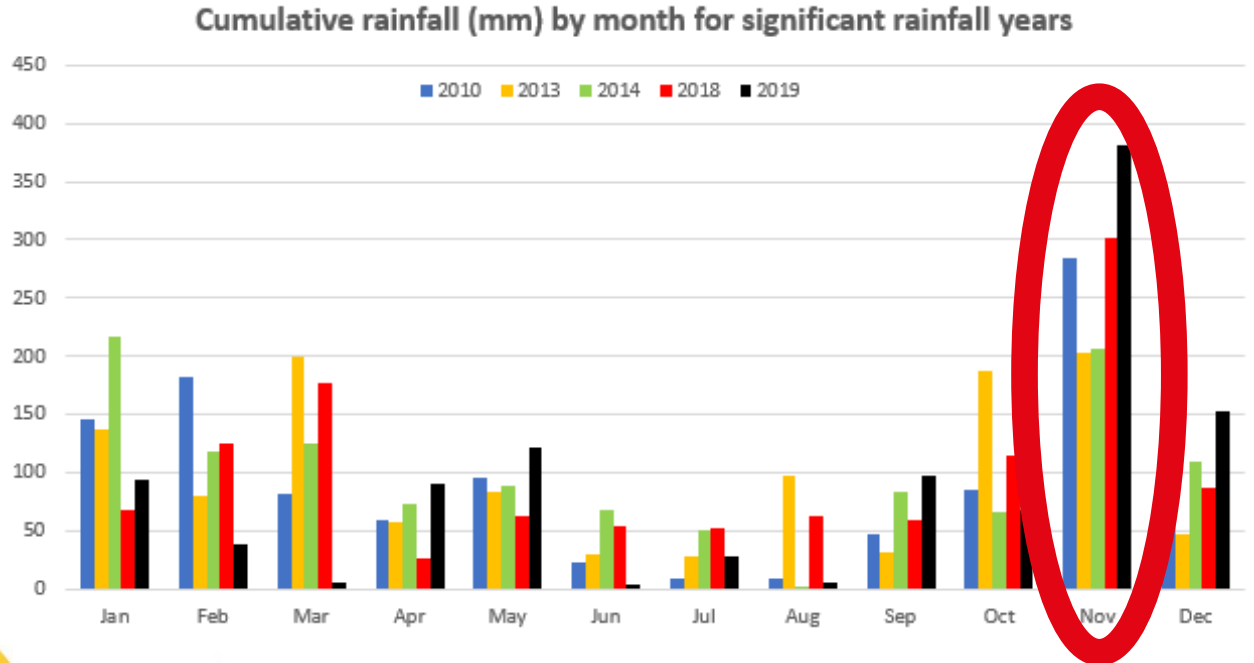
2012 – 2020
5900 ha affected (dead/stressed)
22% of production

- Zespri staff think this is on the high side (3000 ha)
- Zespri staff estimate 3% of Gold3 is impacted

What is Causing KVDS?

We aren't exactly sure…some ideas:

- Many Italian soils are challenging (low organic matter, high clay)
- Extreme weather events
- Conditions suitable for *Phytophthora* (or *Phytophthora*-like microbes)

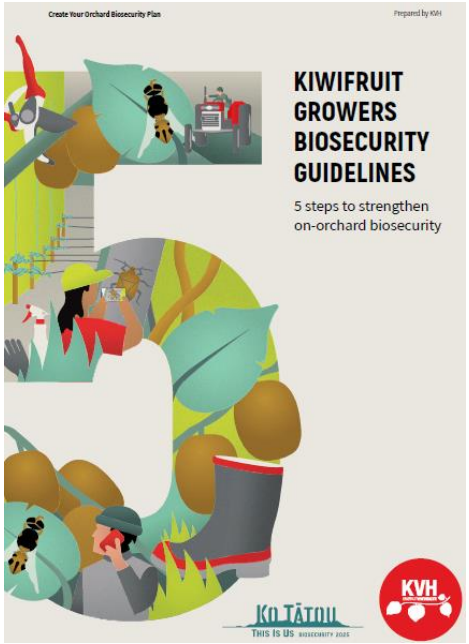


What should New Zealand do?

KVH & Zespri monitoring closely – no need for additional controls

Covid-19 limiting travel

Good protocols for machinery already in place due to BMSB



Agree what must happen on site	Actions and considerations to reduce risk	Actions I have taken to protect my investment
Set expectations with post-harvest, contractors and managers	Set your expectations with post-harvest, contractors and managers. They play a key role in biosecurity risk management. You may wish to formalise expectations in their contracts.	Who are the post-harvest operators, contractors and orchard managers I have established my biosecurity expectations with?

Kiwifruit Trunk Disease:

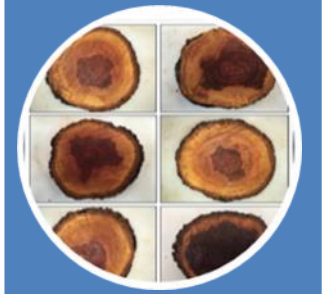
Understanding our biodiversity and risk

Erin Lane - Biosecurity Adviser

Understanding KTD in New Zealand

What's happening offshore

Unusual symptoms



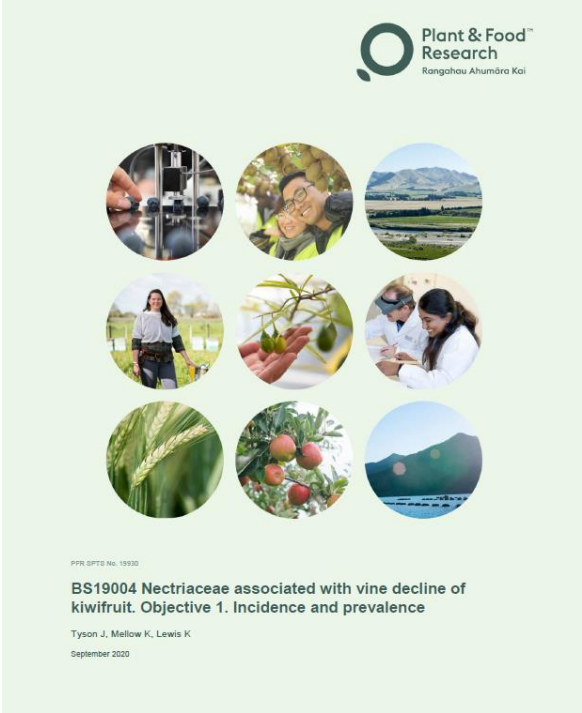
Targeted Research

Developing management advice

Understanding our biodiversity and risk

BS19004: Emerging risk of vine decline

- Project started early 2019
- **Which pathogens are associated with kiwifruit trunk disease?**
- Focussed on the fungal group Nectriaceae
  - *Fusarium* and *Cylindrocarpon*-type
- Why?
  - Overseas, this group of fungi has been associated with wood decays of kiwifruit
  - Previous work in New Zealand has also indicated that this group is likely to be involved in vine decline here.
  - Unusual symptoms reports have isolated a number of these organisms



What did we do?

- Surveyed one block on each of three orchards
  - Paengaroa
  - Te Puke
  - Motueka
- Assessed the amount of visibly diseased vines
- Sampled ‘trunks’ of 10 asymptomatic and 10 diseased vines
- Isolations across the length of the woody cores

Outcomes to date:

Results

- 18-34% of vines were visibly diseased
- Asymptomatic vines often had stained core samples
- Each orchard block was different
  - Most common symptom
  - Most common species
  - Overlap between the three blocks
- Many species within the Nectriaceae
- 3 major groups were more prevalent in the diseased vines
  - *Neonectria microconidia*- *research underway*
  - *Fusarium solani* complex- ??
  - *Ilyonectria* species group- *research underway*

What's next?

Identifications

- ***Fusarium solani* complex**
- ***Ilyonectria europaea***
- ***Ilyonectria liriodendri***
- ***Ilyonectria robusta***
- ***Ilyonectria* sp.**
- ***Ilyonectria torresensis***
- ***Neonectria microconidia***

So, what do we know?

- Trunk diseases of kiwifruit are a complex problem, likely caused by a complex of fungi.

- Similar to GTDs (grapevine trunk disease)
  - 100 years of research
  - Increasing in incidence
  - Still a limiting factor for grape production and more prevalent in young plantings

- Barely scratching the surface. Needs research to unlock:
  - the different fungal combinations involved
  - sequence of infection, source of inoculum, species epidemiology
  - other fungi that are not in the Nectriaceae e.g. *Neobulgaria alba* (Orchard 1)
  - effect of cultivar, rootstock, orchard age, environment
  - What we have (current biodiversity)
  - What is new (incursions)

KTD management advice

- Regular orchard monitoring. Tag vines with unusual symptoms, avoid these when conducting orchard practices that involve open wounds on trunks and leaders.
- It is unlikely that seriously affected vines can be cured (e.g. significant trunk damage). These vines should be removed and replaced, and a replanting strategy developed.
- In some cases, infections isolated to leaders may be managed by removing the affected part of the plant and re-developing a replacement leader (e.g. *Neonectria* cut-out).
- Tool hygiene is key. Sanitise tools as often as possible. Ideally between vines, but between rows or blocks should be routine. Always sterilise tools before entering a different orchard.
- The use of wound protectants containing fungicides should be used to protect wounds where possible, particularly in orchards where there is evidence of vascular diseases.
- Report the unusual!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