



Reporting the unusual: What does this mean?

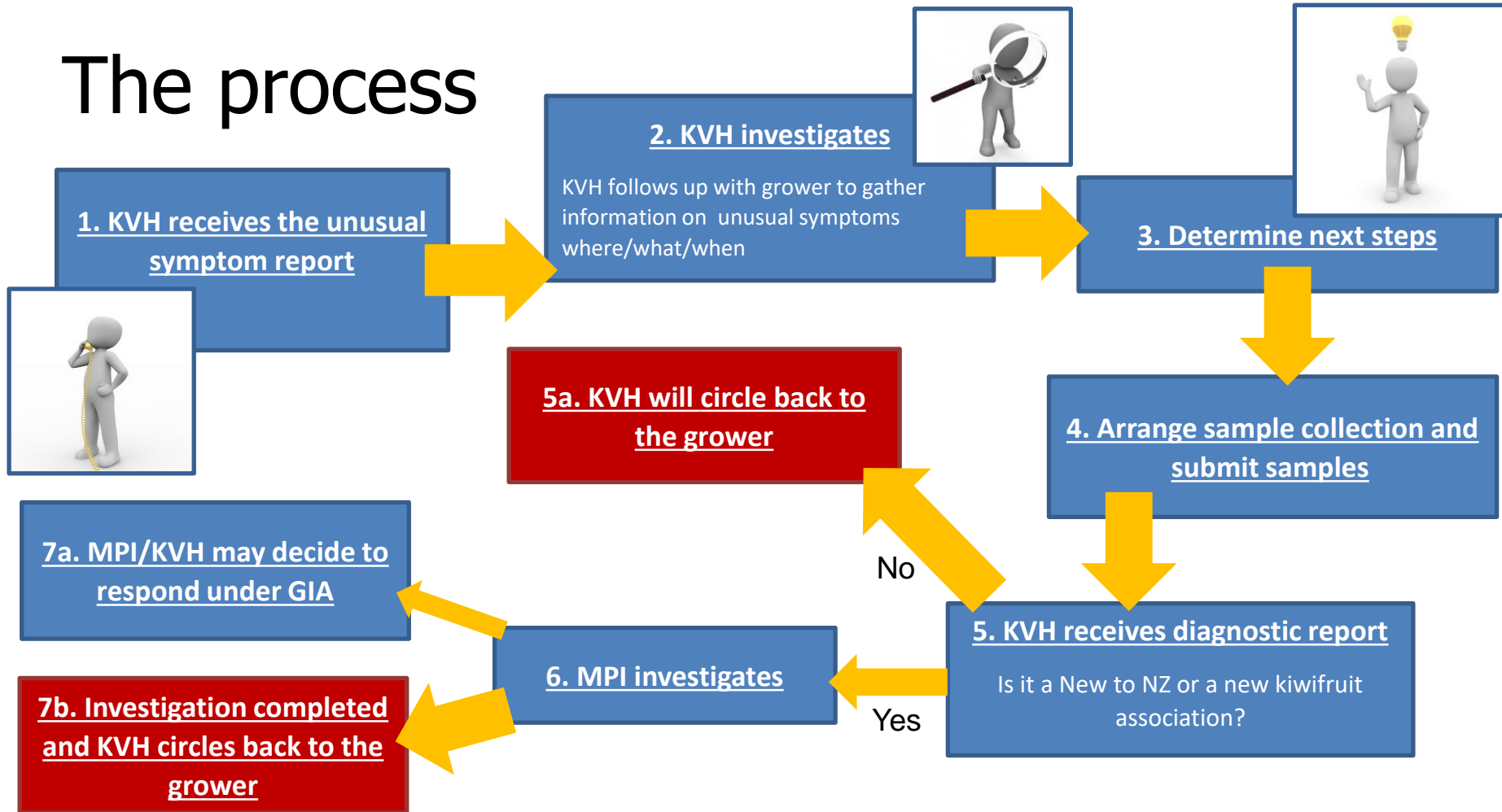
Linda Peacock and Erin Lane- KVH



Why report the “unusual”?

- Unusual is anything without an obvious explanation, or even a change in what was previously considered “normal”
- General surveillance is important to facilitate early detection. This is one of the biggest predictors of eradication success.
- Reporting of unusual symptoms gives industry the best chance of identifying things that are “new” or emerging
 - possibly organisms new to NZ science
 - new associations of organisms with kiwifruit
 - organisms already present but risk profile appears to be changing

The process



Summary of 2020 reports



37 reports through to KVH

- 17 pathogen related
- 10 pest/insect
- 2 nutritional
- 5 "other"- i.e. associated to frost damage, girdling damage
- Jury is still out on a few recent reports...

On what?

HW, G3, Bounty, Bruno,
Cryptomaria

Where?

Kerikeri, Whangarei,
Waiuku, Tauranga, Te
Puke, Opotiki, Hawke's
Bay, South Island



Case Study 1: G3 – Hawke's Bay

- Areas with poor bud-break seen in Spring 2019
- Production drop at 2020 harvest
- Mushy buds reported – autumn 2020
- Various canker symptoms also seen - some associated with grafts
- Samples went to MPI

Lab Accession Number: T20_01576
PHEI Report Number: 134363

Plant Address: PO Box 2095, Dunedin 91, Sullivans 1140, New Zealand
Postal Address: 211, South Road, St. Johns, Dunedin, New Zealand
Email: Specimen.Reception@mpi.govt.nz

Final Report GENERAL SURVEILLANCE

CUSTOMER SUPPLIED INFORMATION	
Submitter Reference: Consignment No: Investigation Case No: Investigator Name:	Submitter: Linda Peacock Submitter Phone No: (0)274752000 Submitter email: linda.peacock@mpi.govt.nz Submitter Address: Kaitiaki Vine Health (VPH)
Collector: Collector Phone No: Collection date: Country of Origin: Submitter Comments:	Site: 10 Haumona Road, Hastings Collection date: 20/07/2020 Country of Origin: NZ The customer has supplied host and sample reference information

Micrology Comments
Soil, root, bark, and cane (bud) samples of three kiwifruit plants showing disease symptoms have been submitted for testing. Several large and leafy-like organisms were isolated using azygic and lobing
Phytophthora was not detected from root and soil samples, but a range of Phytophthora are commonly found in soil and water and some have been well as root rot of hydroponic crops. Their effect on robust kiwifruit sp
Several of the isolated organisms have been associated with disease here, some of all of them have contributed to the observed symptoms.

MYCOLOGY LABORATORY IDENTIFICATIONS

Alternaria adhaerens (Ascomycota: Hyphomycetes)
This fungus was isolated from leaf material. It has been reported to be present in New Zealand. It was previously isolated from the

Epicoecium nigrum (Ascomycota: Hyphomycetes)
This fungus was isolated from leaf material. It is known as a common large species is present in New Zealand.

Epicoecium italicum (Pezizomycetes: Diaplethelaceae)
This fungus was isolated from leaf material. It was first described in 2017 and reported from *Alice adhaerens* in Italy. In New Zealand, it was previously isolated from *Alice adhaerens*, *Persea americana*, and *Ranunculus acris*. It is likely to be a secondary invader on this host.

Clonostachys rosea (Ascomycota: Hyphomycetes)
This fungus was isolated from bark tissue.

Ilyonectria robusta (Ascomycota)
This fungus was isolated from bark tissue.

Diaporthe australafricana (Diaporthales: Diaperthaceae)
This fungus was isolated from bark tissue. Organisms that been associated with canker and dieback disease on a range of hosts, including *Vitis rotundifolia*, *Vaccinium sp.*, *Corylus avellana*, *Pinus taeda*, *Salix sp.*, *Agave sp.*, and *Persea americana*. It has also been reported to cause root-knot disease in kiwifruit in China. *Diaporthe australafricana* has not been reported as present in New Zealand. However, DNA sequence analysis of the ITS region revealed that this isolate is identical to an isolate bank from New Zealand. Further descriptive details in 2019.

Globisporangium intermedium (Pezizomycetes: Pythiaceae)
This large-like organism was isolated from soil and was formerly known as *Pythium intermedium*.

Fusarium sp. (Ascomycota: Hyphomycetes)
This fungus was isolated from root tissue. It belongs to the *Fusarium solani* species complex.

MYCOLOGY LABORATORY RESULTS

Epicoecium nigrum (Ascomycota: Hyphomycetes)
This fungus was isolated from leaf material.

Epicoecium italicum (Pezizomycetes: Diaplethelaceae)
This fungus was isolated from leaf material.

Clonostachys rosea (Ascomycota: Hyphomycetes)
This fungus was isolated from bark tissue.

Diagnostic report

Buds *Alternaria aborescens* – Secondary coloniser

Epicoecium nigrum – Secondary coloniser

Epicoecium italicum – Secondary coloniser

Trunk *Ilyonectria robusta*- known to cause kiwifruit disease offshore- causes black foot in grapes

Clonostachys rosea- Likely endophytic organism

Fusarium solani sp- Known to cause root rot in many hosts and often isolated from kiwifruit

Fusarium equiseti - Primarily known as a saprophyte or secondary invader

Diaporthe australafricana- Reported as new to NZ

Root *Pythium rostratifingens*

Fusarium solani sp- Known to cause root rot in many hosts and often isolated from kiwifruit

Mortierella sp- likely saprophytic

Soil *Pythium sp.*- likely to represent an unidentified species

Phytophthora vexans

Globisporangium intermedium (previously *Pythium intermedium*)



Case study 2: Shelter species

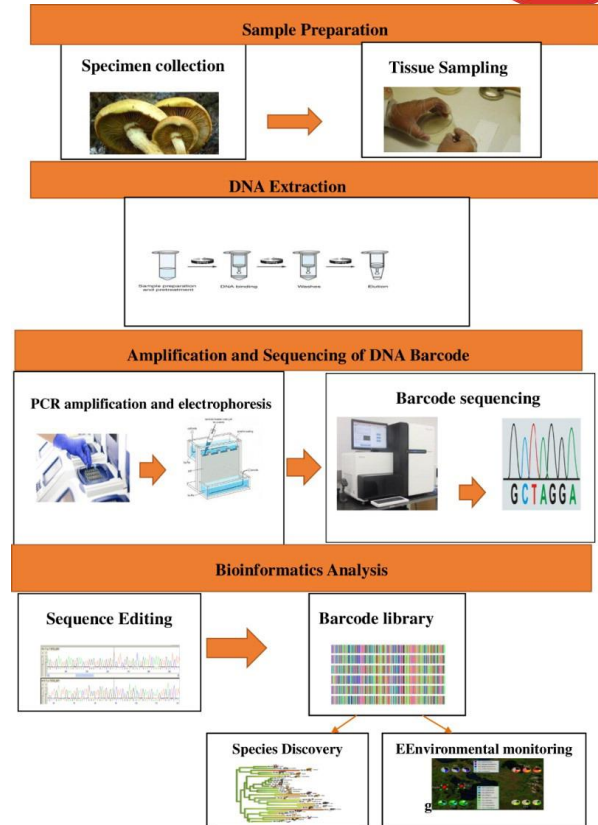
- 2019: 5-6 (2m) trees with symptoms
- 2020: more symptoms, including on two more sites (>5km away)
- Counted 50-80 affected trees (0.5-1.8m). Problem trees were often in groups (5-15 trees)
- No change in planting, fertilizer, or irrigation processes
- Root samples showed ***Phytophthora cryptogea*** and ***P. cinnamomi***, *Cylindrocarpon sp.*, *Pythium sp.*
- In stems: *Pestalotiopsis sp.* (associated with dieback and cankers in conifers)



Improvements in Diagnostics



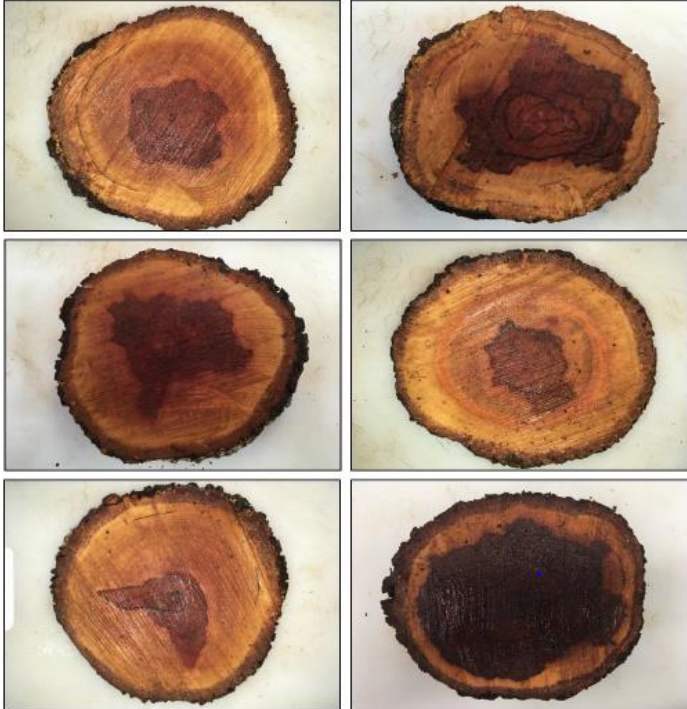
- Previously cultured based, morphological methods were relied upon
- Disease can be caused by a complex of organisms, making diagnostic difficult
- New molecular methods (i.e. sequencing) spit out more “new to NZ” but are they really?
 - Renamed- not really “new” but a new name
 - Complexes are separated into species
 - Previously “unidentified”



What do we do with these reports?



Tyson JL, Mellow KD, Lewis K
March 2020



Research extension



Creating good management practice advice



Understanding changes in risk profiles



Sharing the knowledge



Questions?