

Application to bring Pelargonium zonate spot virus into containment to evaluate diagnostic tools

The kiwifruit industry is funding a project that will provide the industry with the ability to detect Pelargonium zonate spot virus (PZSV) should it arrive in New Zealand.

PZSV is one of only two viruses known to induce severe symptoms in kiwifruit. This virus is widely distributed in many species but has only been reported in kiwifruit in Italy. It has not been reported in New Zealand.

Proposed research

Permission is being sought from MPI to import freeze-dried tissue containing PZSV and its use as reference material (positive control) to evaluate a molecular test for detection of the virus. The test would be used for the benefit of the industry by testing incoming material and providing a tool for rapid testing should we be faced with an incursion of this organism.

The purpose for importation is molecular test method validation. The suitability of several published PCR primer pairs for detection of PZSV in kiwifruit will be trialled by using them to detect the imported virus samples. To enable this research, a range of virus strain samples need to be imported from a wide geographical area, to ensure that the developed test can detect known strains of the virus.

If detection using the published primers is not reliable, new primers will be developed, tested and optimised for use with kiwifruit. Additional primers may also be developed to allow alternative molecular test methodologies (e.g., quantitative PCR).

The laboratory-based work is to be performed in containment at Plant & Food's Palmerston North quarantine testing laboratory. It has been assessed and supported by Tanenuiarangi Manatwatu Inc, representing Rangitane O Manawatu, and will be subject to oversight by Plant & Food's Biosafety Advisory Committee, and MPI's containment facility audit & inspection processes.

What are the risks?

The imported material is in an inactive state and will undergo destructive sampling. Escape of the virus would most likely require infection and release of infected plant material from the L3 PEQ greenhouse associated with the quarantine testing laboratory.

Risk of direct escape into plants within production orchards is very low due to the isolation of the PEQ facility and its staff from production regions.

In addition, it has been noted by the Ministry for Primary Industries (MPI, 2012) that there is no known insect vector for this virus, and that mechanical transmission is considered the only mechanism for spread in the environment.

Therefore escape is considered extremely unlikely given the nature of the proposed research and the controls in place (see below), however it is not an impossibility.

Controls include the following

- The scope of this work will be limited to the development of molecular diagnostic tests.
- Virus-infected material will not be used to deliberately infect new, live plant hosts.
- No live plants will be held in the same room within the containment facility used to store the virus, or for sample extraction.
- All virus-infected samples will be kept in double-sealed containers, and when not in use will be stored in a locked freezer.
- All diagnostic procedures involving viable virus material will be carried out at Physical Containment Level 2 (PC2) [as specified in the AS/NZS 2243.3:20023 standard "Safety in Laboratories, Part 3: Microbiological aspects and containment facilities].
- Laboratory access will be restricted to ensure all unauthorised people are excluded from the facility.

KVH consider the benefits of having a tool to screen incoming material and use in a response, outweigh the small amount of risk of bringing freeze dried plant material into a controlled laboratory setting for molecular work only.