

Desired outcome

To provide information that enables Growers, KVH (including regional coordinators and committees) and other kiwifruit industry organisations to adapt their strategy and approach to management of Psa-V.

Background

The objectives of monitoring for Psa-V are to:

- i. comply with regulatory requirements under the NPMP (including to report against performance measures identified in the NPMP);
- ii. assess the National impacts of Psa-V on kiwifruit production in order to ensure appropriate strategies including level of investments, are in place in order to mitigate;
- iii. give timely and science based information for growers in order for investment decisions to be taken, especially related to change over to new varieties; and
- iv. understand what is working in the field in order to provide best practice management advice to growers in order for them to minimise the impacts within orchard.

At the highest level the overall impacts of Psa-V will be reflected in crop volumes and orchard grower returns after expenses. While seasonal variation will impact on this as well, KVH will analyse these statistics over a number of years and adjust for seasonal variation to monitor the longer term overall impacts of Psa-V.

Specific on-orchard monitoring is challenging in order to get meaningful results due to the large number of variables that come into play, depending on orchard management practices, varieties involved, spray program utilised, orchard location and environmental factors, along with the Psa-V situation in the neighbouring orchards. As such, KVH will utilise case studies along with more traditional monitoring approaches to maximise the relevance of the data collected.

Advanced technology options will be considered, for example estimating orchard canopy coverage in gold varieties using aerial images, and video sensing software to estimate bud-rot in green varieties to give another indicator as to Psa-V impacts.

NPMP requirements

The NPMP identifies monitoring as a 'principal measure', to enable an understanding of:

- i. the distribution of Psa-V;
- ii. where the levels of Psa-V present a significant risk to other orchards, regions, or other places;
- iii. the impacts of Psa-V on kiwifruit varieties and cultivars;
- iv. the overall impact of Psa-V on kiwifruit production;
- v. the effectiveness of Psa-V control tools and management practices; and
- vi. the levels of compliance with the requirements of the Plan.

Growers need such information to inform their individual orchard management decisions. Local and regional grower communities need such information to ensure they act in a coordinated way. KVH needs such information to assess risk and to manage and adapt the overall disease programme at a national level.

To enable effective monitoring:

- Rule 3 in the NPMP requires that symptoms, or potential symptoms of Psa-V, that are recognised for the first time in an orchard must be reported to KVH within 48 hours.
- Rule 4 in the NPMP requires provision of information that KVH or an authorised person reasonably believes is necessary to: monitor the distribution of Psa-V; or monitor the level of Psa-V present; or trace movements of any risk item in order to identify the source, or potential source, of any new Psa-V infection; or identify where a risk item has been moved to and whether that movement could result in further Psa-V infection.

- An authorised person can exercise a range of administrative powers where these are needed (e.g., power of inspection, power to give directions).

The NPMP proposal identified that minimum monitoring requirements are to be set on an annual basis, and be specified in the Operational Plan that implements the NPMP (i.e. as required under s.100B of the Act).

Best orchard practices require Growers to have a good monitoring strategy in place for early detection of Psa-V symptoms. Spring and Autumn are considered high-risk infection periods.

The minimum annual monitoring requirements for Growers are set out in box 4, below

Box 4: Mandatory monitoring requirements for 2013

For 2013, mandatory monitoring for all orchards in all regions is required as follows:

Recovery regions—one round for both Psa-V positive and 'Not Detected' orchards.

- in November (reporting to KVH by 10 December).

Note—growers with **Psa-V positive** orchards in Recovery regions are required to carry out their November round of mandatory monitoring and record their results which should be kept with their GAP records. They are encouraged to submit their mandatory monitoring results to KVH by 10 December. However, as of 28 November 2013, reporting these results to KVH is no longer a mandatory requirement for **Psa-V positive** orchards in a Recovery region under the NPMP.

Containment regions – both positive and Not Detected – two rounds

- in July/August (reporting by 10 September)
- in November (reporting by 10 December)

Exclusion regions – two rounds

- in July/August (reporting by 10 September)
- in November (reporting by 10 December)

Results of mandatory monitoring must be provided to KVH by all Growers by the dates specified above. Best practice advice on monitoring (including frequency and methods at different times of year, in relation to weather events etc.) is provided to Growers in Psa-V Monitoring protocol, available from the KVH website (www.kvh.org.nz/monitoring).

Implementation approach for monitoring

Roles in monitoring

In order to meet the objectives, KVH believes the monitoring activities being undertaken should cover several different components, some of which are undertaken by KVH, but other activities should be conducted by other groups in the industry as follows:

- Grower self-managed monitoring which includes web based ability to report which is part of the mandatory requirements of NPMP and may be conducted by or in conjunction with post-harvest facilities.
- Early identification of Psa-V in exclusion regions (KVH and post-harvest).
- Overall performance of kiwifruit in a Psa-V environment (KVH, Zespri and post-harvest).
- Relationship between environmental factors and Psa-V (KVH, Zespri and post-harvest).
- Regional differences in the way Psa-V impacts orchards (KVH, Zespri and post-harvest).
- Impacts of different management techniques in dealing with Psa-V infection (KVH, Zespri and post-harvest).
- Establishment and performance of new varieties in infected orchards (varietal owners).
- Status of certified nurseries (KVH).

Focus of targeted monitoring for 2013

The focus of targeted monitoring for 2013, and the organisation responsible for carrying out that monitoring, is as follows:

1. Grower mandatory monitoring (Growers, directed and collated by KVH)
 - See Box 4 for details.
2. Sentinel orchards (KVH)
 - Orchards in Exclusion regions - Whangarei, North-West Auckland South Island, and Wanganui/Horowhenua.
 - Up to three orchards to be monitored in each exclusion region, chosen based on risk factors (susceptible location, varieties and/or rootstock weather patterns, plant and/or equipment movement).
 - Regional committees to assist with identification of these orchards.
 - Monthly monitoring during higher risk periods of spring and autumn with ability to add in another round if a weather event occurs.
 - Using people in the region to monitor which has the advantage of having skilled and trained monitoring personnel ready to respond in the event of an incursion.
3. Performance of kiwifruit in a Psa-V environment.
 - Side by side trial at Plant and Food Te Puke, currently in place started late last year- monthly monitoring for two years (KVH).
 - Information from grower mandatory monitoring (KVH).
 - Case study comparison of a selection of orchards that follow best management practice based on information contained in the orchard management plans for orchards in recovery regions (Te Puke, Katikati, Opotiki) and monitoring undertaken three to four times per year over two years (KVH).
 - Other investigations and reports on situations with specific growers/locations (Zespri and post-harvest).
4. Impact of environmental factors (temperature, elevation, etc.) on specific Psa symptoms.
 - Case study looking at flower drop/bud rot in green varieties (HW and Green14) in Waihi, Maketu, Edgecumbe including badly affected orchards along with unaffected orchards in each area – seasonal monitoring over two seasons (KVH).
 - Case study of Hayward male infection (particularly Chieftain that have been heavily infected in past seasons) for two years – elevated Te Puke and Waihi (KVH).
 - Other investigations and reports on situations and practices that are having an impact with specific growers (Zespri and post-harvest).
5. Regional variation with impacts of Psa-V.
 - Case study monitoring three infected orchards in Gisborne, South Auckland, Waikato region - covering Hort16A, Hayward, and Gold3 – spring and autumn for two years (KVH).
 - Other investigations and reports on situations with specific growers (Zespri and post-harvest)
6. Study of new variety establishment in infected orchards.
 - Graft/vine establishment when stumps have been heavily infected (previous Hort16A orchards grafted to Gold3) – monitored spring and autumn for two to three years (Zespri).
 - Performance of new varieties during establishment and production (Zespri and other new varietal owners).
7. Specific case studies to understand the benefits or otherwise of different management techniques, supporting R&D efforts and identifying R&D work that may be needed.
 - e.g. cutting green vs. dead wood, covered blocks etc.(KVH/Zespri and post-harvest)
 - Considered on a case by case basis after full consideration and discussion on the merits along with who is best placed to undertake.
8. Nursery monitoring
 - To give growers confidence of compliance with protocols and health status of plants from accredited nurseries (KVH).