

# KPCS Best Practice Fact Sheet



## Monitoring, Sampling and Testing

### Background

Early detection and early intervention is the most effective method for controlling or minimising, the potential impact and spread of pests and diseases. Early detection is most readily achieved by nurseries that conduct an effective monitoring programme.

An effective monitoring programme is regular and follows best practice. Ineffective monitoring is not likely to result in early pest and disease detection and is likely to be detrimental to the nursery operator by providing a false confidence in the health status of the nursery.

### Scope

This factsheet provides nurseries with best practice advice for monitoring of their own operations for target pests and diseases. Independent third party monitoring can provide an added level of confidence that a nursery is free of target pests and diseases, but is not covered within this factsheet.

### Creating a monitoring plan

- Monitoring should be done on a routine and consistent basis.
- Best practice is to monitor on a weekly basis particularly during periods of active growth to ensure any new symptoms are detected early.
- Nurseries should identify high risk areas within their operation and consider more frequent monitoring for those plants.
- Nurseries too large to effectively monitor all plants every week can monitor a smaller portion of plants on a weekly basis.
- A monitoring plan should be created to ensure that different plants are monitored each week and that every plant is inspected over a monthly period.
- Monitoring alternate rows, or alternate blocks across the entire nursery on a weekly basis is preferable to monitoring every plant in a section of the nursery each week as it is more likely to result in early detection of any pests or diseases.
- Labelling the different monitoring routes e.g. route 1, route 2 etc. provides a consistent and simple way of recording what plants have been monitored each week.
- The time taken to monitor will depend on the size of plants and the nursery layout, although nurseries can expect to cover around 3000- 4000 plants per hour.



**Example:** Monitoring for a 50,000 plant nursery evenly distributed over 10 blocks.

In the example below, the nursery uses four different monitoring routes to cover a large operation. This simplifies the record keeping and ensures that all plants are monitored over a one month period.

Depending on the operational layout, this example may take one person three hours a week.

Route #	Week	Blocks	Rows	# of plants
1	1	1,3,5,7,9	odd numbered rows	12,500
2	2	2,4,6,8,10	odd numbered rows	12,500
3	3	1,3,5,7,9	even numbered rows	12,500
4	4	2,4,6,8,10	even numbered rows	12,500

Note: the description above is best practice advice but may not be practical for some operations. Nurseries may instead choose to monitor less frequently, such as monthly but cover the entire operation in a single go. This meets KPCS Standard requirements and may be simpler to manage but is less effective for the early detection of pests and diseases.

## Effective monitoring

- Particular attention should be given to high risk areas;
  - In indoor nurseries this is likely to be closest to entrances, vents and areas in close proximity to people movements.
  - In outdoor nurseries this is likely to be areas; exposed to prevailing winds, near entrances and other boundaries particularly those closest to any neighbouring orchards.
- Carry out monitoring after any high risk periods such as adverse weather events, plant movement or activities that may cause wounding. For many pathogens (such as Psa-V), young leaves will be likely to show infection first.
- Good record keeping is essential for effective monitoring;
  - All monitoring rounds need to be recorded with the date, staff conducting monitoring, plants monitored.
  - Observation of any symptomatic plants or presence of pests must be recording accurately noting; what was observed, detailed location of plant, follow up actions, outcome of these actions or testing results once available.

## Who should do the monitoring

- Staff conducting monitoring should be trained in the task by the nursery manager.
- Monitoring staff should be focused solely on monitoring. It is difficult to effectively monitor plants while carrying out other tasks in the nursery.
- Monitoring staff should clearly understand what they must do if they find anything suspicious.

## What to look for

- Symptoms of any target organisms (see Appendix 1), plants displaying unusual symptoms, presence of pests unidentifiable to the monitoring staff.
- Symptomatic plants should be clearly tagged, dated and photographed.
- If possible (for containerised plants especially), suspect plant should be sampled and removed to a quarantine area. The location it came from must be clearly identified and recorded and precautions taken for surrounding plants such as the application of a protective spray until results are confirmed.
- If symptomatic plants are observed advise KVH on 0800 665 825 immediately. KVH can assist with advice to determine if sampling is required for testing, and what other measures may be necessary to prevent spread within the nursery and to other operations.

## Notification to KVH

- Contact KVH on 0800 665 825 or email [info@kvh.org.nz](mailto:info@kvh.org.nz) if any suspicious symptoms are observed **before** taking samples.
- Suspected Psa-V infection in a nursery must be reported to KVH immediately and within 48 Hours of identification.

# Appendix 1: Monitoring and sampling for Psa-V

## Identification of Psa-V

KVH have produced a number of resources to assist in identifying symptoms.

- [KVH Information Sheet—Identification of Psa-V Symptoms](#)
- [Psa-V Symptoms Guide](#)
- [Psa-V Symptoms Guide for ZESPRI varieties](#)
- [KVH Seasonal Management Guide –‘Psa-V Yearly Monitoring Guide’](#)
- YouTube video on [Psa monitoring and common symptoms](#) demonstration video

## Sampling symptomatic plants

- If Psa-V like symptoms are suspected or identified, leaf samples may need to be taken from symptomatic plants and tested to confirm their status.
- **Always contact KVH before sampling symptomatic plants for advice on sample procedure. Ensure you have photographs of the symptoms seen.**

## Sample size and collection

- If collecting leaf samples, five leaves should be collected from each symptomatic plant. If multiple plants are symptomatic, it is recommended five leaves from three representative symptomatic plants are taken.
- During dormancy KVH may recommend cane sampling. Nurseries will be advised of the procedure required.

## Leaf sampling

- The recommended number of samples is three sets of five leaf samples.

Please collect your sample as follows.

1. Collect five leaves from one symptomatic plant. If plants are very small then 2-3 leaves will do.
2. Do not touch the leaves with your bare hands during the collection process.
3. Seal the five leaves in a re-sealable bag.
4. Label the bag as indicated below.
5. Mark the site where samples are taken with tape and record the sample number, date and sampler name on the tape.
6. Collect five leaf samples from each of three symptomatic plants—repeating steps 1–5 above. If there is only one plant with symptoms then one sample will suffice.

## Sample labelling

- Clearly label each bag with the nursery name, sample number, location and date.

## Lab sample information

- Obtain a lab submission form for [Hill Laboratories](#).
- Make comprehensive notes on the level of symptoms seen in the nursery.
- Ensure all areas of the lab form are completed in full—including location details. This includes block, row, bay and variety.
- Details on the lab submission form must match the labelling on the sample bags.
- Indicate whether the sample is from a male or female plant if applicable.
- Include variety if the sample is from a male plant.
- Ensure the name of the person who took the sample is recorded on the form.
- Record spray information, including the date of last spray and chemical used.

## Sample dispatch

- Seal all small sample bags in a large outer bag.
- Label the outer bag with the nursery name and date.
- Courier sample to chosen Lab (address details are on lab submission forms)

## Testing and results

- Tests are completed by Hill Laboratories. They take approximately 48 hours to complete. In some circumstances KVH may cover the cost of testing.
- Sample tests will only show the status of the plants sampled at that point in time.
- A 'Not Detected' result means there was no bacteria found on the sample taken at that time. It does not necessarily indicate the entire nursery is Psa-V free.
- Test results, along with a copy of the test, will be emailed to the email address provided. This information may come from either KVH or directly from the testing lab.
- To follow up on your test results, contact KVH on **0800 665 825** or [info@kvh.org.nz](mailto:info@kvh.org.nz).
- Continue to monitor your nursery and note all changes.
- Contact KVH if you think re-testing is required, or if you find other symptoms.