



# Research and Development Update

## December/January

This bi-monthly R&D update provides information about the progress over December 2014 and January 2015 for the Psa R&D programme, managed for KVH by the Zespri Psa Innovation team.

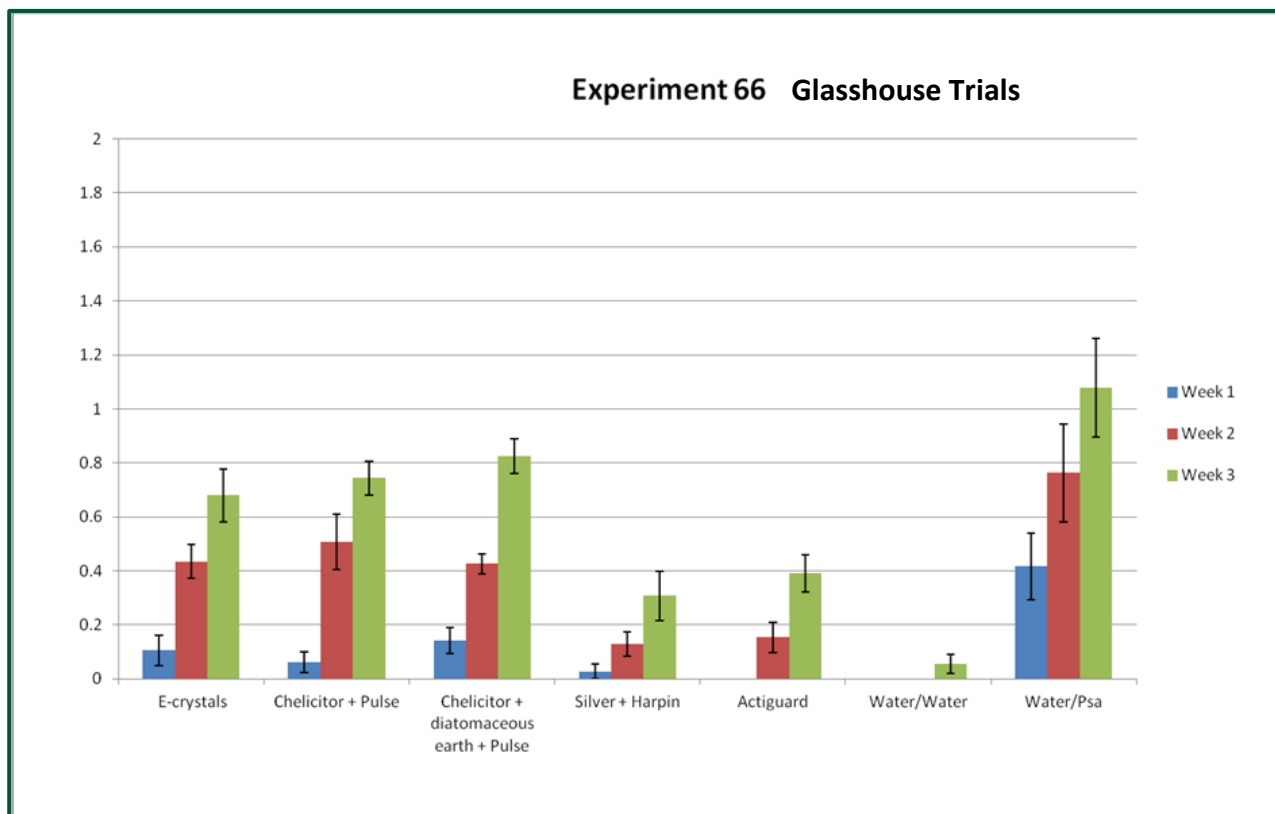
### Biosecurity Research

*Ceratocystis fimbriata* literature review.

Professor Tom Harrington (Iowa State University) has been subcontracted to write a review of *C. fimbriata* and its effect on commercially important crop species, including kiwifruit. A summary will be available on the KVH website once review of this report is complete.

### Psa product testing

The Psa product testing programme has commenced for the 2014/15 season. Glasshouse trial results indicated Harpin (ProAct) combined with silver significantly reduced Psa disease severity in young potted kiwifruit plants ( $p = 0.05$ ). This product combination is now undergoing further testing in a larger potted plant trial using Gold3 plants.



## Potted plant trials

The first 2014 trial tested a range of products, including dilutions of Nanopsada. The data has not been statistically analysed yet. However, indications show the dilutions of Nanospada do not exert any effect in reducing the symptoms of Psa-V.

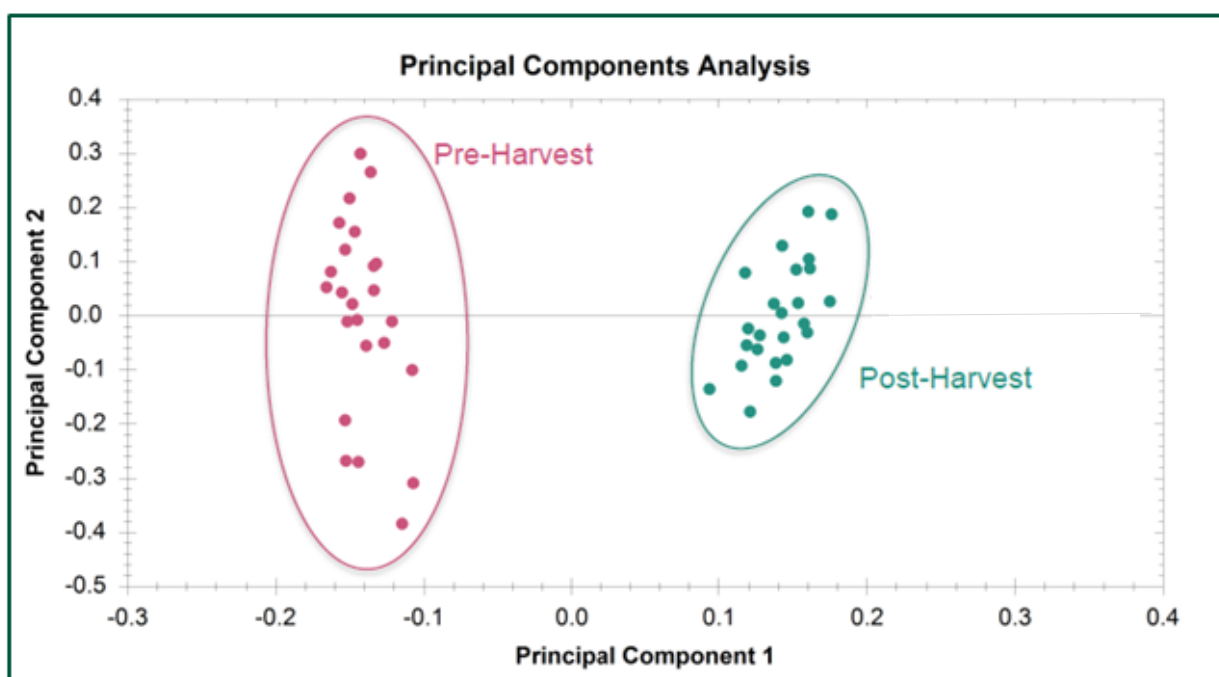
An elicitor trial on Gold3, which includes testing Harpin and Silver (see Glasshouse trial data) and Citrox BioAlexin has commenced, as has the Plant and Food Research/Bioprotection Centre biological control (BCA) trial.

## Metabolomics

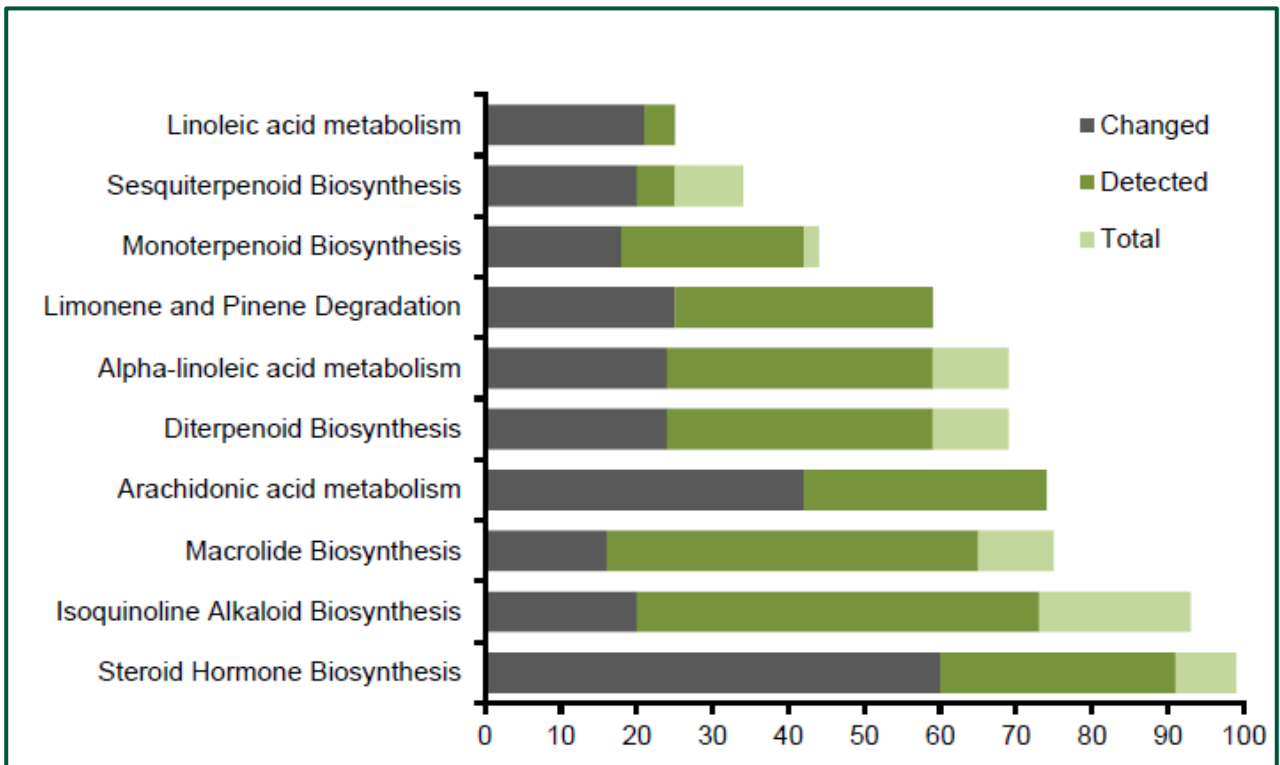
*Changes in vine metabolism associated with vine phenology and vine management during the year.*

This project has been undertaken to understand how the metabolism of commercial cultivars change over the course of a year. It has a particular focus on biochemical pathways which are recognised as components of a vine's immune system. Samples have been taken at timings which link to vine management, harvest or distinct phenological phases that may trigger an immune response positive or negative with respect to Psa-V. Sample collection and analysis are now complete for this project and the final report is being compiled.

Presented below is an overview of the results for Hayward vines during the harvest period. It outlines gross compound changes (Fig 1) and specific pathways that are triggered in response to removing fruit from the vine (Fig 2).



**Figure 1:** PCA plot of pre-and post-harvest differences of Hayward Cultivar samples based on compounds with  $P < 0.05$  and fold changes greater than 2.



**Figure 2:** Graph showing the most significantly altered pathways as determined by METLIN database. The x-axis represents the number of compounds detected and that changed between pre- and post- harvest for the Hayward Cultivar.

This work allows us to assess, from a biochemical perspective, when vines are likely to have a compromised immune system during the year and also when Psa-V control measures, such as the use of elicitor compounds, may be most beneficial.

### Canker management update

The Gold3 Canker management project has been tracking well and an interim report is expected when summer assessments are complete.