

This R&D update highlights a selection of the recent research activities that Summerfruit NZ has been progressing over the last 12 months. Much of the focus of the Summerfruit NZ research investment has been on crop protection; testing new biological control tools for efficacy against *Monilinia*, *Botrytis*, and *Pseudomonas syringae* pv. *syringae*. Through the A Lighter Touch programme we have been trialling the fungicide Belanty® for efficacy and residue assessment to extend use of Belanty® for an on label use for Summerfruit. To improve understanding around the causes of replant disease we recently commissioned a review by Plant & Food Research and published a technote from this review.

## Testing new biological control tools

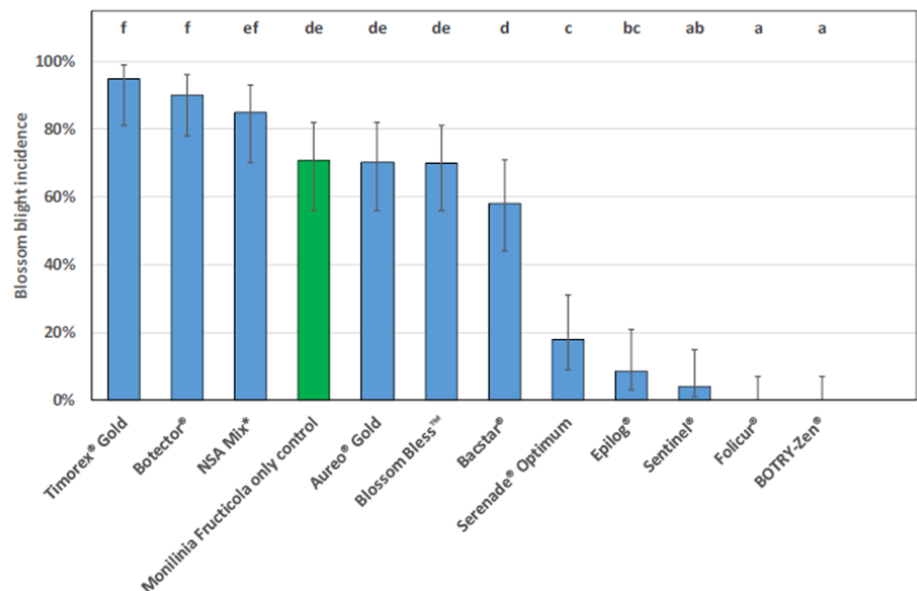
Plant & Food Research have screened eight biofungicides and two natural products in laboratory-based assays to evaluate the efficacy of these products to control Brown rot (*Monilinia*) and *Botrytis*.

### Brown rot

For brown rot testing a detached peach soot assay was used (Figure 1). Results from this screening showed four biofungicides significantly reduced *M. fructicola* infection in terms of the percentage blossom blight measured and the total sum of *M. fructicola* symptoms recorded; (Figure 2). These biofungicides were BOTRY-



**Figure 1.** Detached 'Beryl's Delight' peach shoots with flowers treated with water and then challenge inoculated *Monilinia fructicola*. Flowers were incubated for eight days at between 17 and 25 °C with alternating high and low relative humidity. Note the formation of blossom blight on flower shoots (Parry et al. 2024a).



**Figure 2.** Incidence of full blossom blight on 'Beryl's Delight' peach flowers. Treatments are represented by blue bars, the pathogen-only control is represented by a green bar. 95% confidence intervals are shown (Parry et al. 2024a).

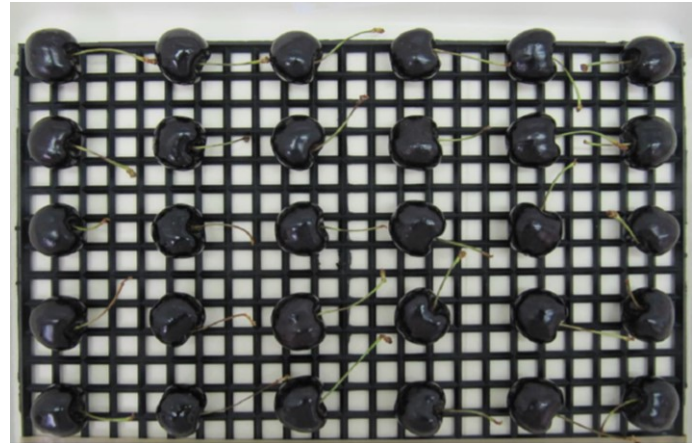
Zen®, Sentinel®, EpiLog® and Serenade® Optimum. The next phase of testing is planned for this season with a further round of efficacy testing in the lab, field testing the best products will start over the 2025-26 season.

## Botrytis

For *Botrytis* testing a detached cherry fruit assay was used to test biofungicide efficacy (Figure 3). The same suite of biological products were used to test efficacy for *Botrytis* as were used in the Brown rot trials.

**Results** from this screening indicated that the fungicide Luna Sensation® (positive control) completely protected wounded and artificially inoculated fruit from *B. cinerea* infection (efficacy = 100%). In contrast, none of the biofungicides significantly reduced *botrytis* fruit rot incidence and severity. Only three biofungicides reduced botrytis fruit rot severity by more than 25% and these were Aureo® Gold (efficacy = 27%), Sentinel® (efficacy = 33%) and Serenade® Optimum (efficacy = 40%). **Next steps** from this screening are that the biofungicides be further tested on a range of detached sweet cherry cultivars (early, mid-, and late-season varieties) in 2025, before advancing any of the biofungicides to a field test.

**Report:** Parry F, Marshall S, Hedderley D, Colhoun K, Elmer PAG, Ah Chee A, Fehlmann C. May 2024. Efficacy of registered biofungicides against *Botrytis cinerea* on detached cherries. A Plant & Food Research report prepared for: Summerfruit New Zealand. Milestone No. 99519. Contract No. 41950. Job code: P/381009/01. PFR SPTS No. 25529.



**Figure 3.** The 'Lapins' cherry fruit set up on sterile plastic grids in plastic trays before inoculation with *Botrytis cinerea*. Each treatment x replicate consisted of 10 fruit (Parry et al. 2024b).

## Bacterial canker - *Pseudomonas syringae* pv. *syringae* (Pss)

To find alternatives to copper-based compounds to control Pss, Timorex Gold® and Actigard® were tested for efficacy against Pss in a series of screening trials.

**Results** of screening Timorex Gold® using a detached cherry shoot and fruit assays indicated that on fruit, the high and medium treatment rates of Timorex significantly reduced the lesion caused by Pss by 55 and 51% compared with the untreated/inoculated control. The results were comparable with those achieved by Kocide Opti. On detached shoots, the high rate of Timorex significantly reduced the necrotic area by 83% compared with the untreated/inoculated control and was comparable with results from Kasumin® and Kocide Opti™.

Actigard® is a plant defence elicitor and was tested by spraying cherry trees and using shoots from these trees to challenge against Pss. This trial showed a significant Actigard® effect when treated shoots were detached and inoculated 4 dpt with Pss. However, lesion length was not significantly reduced when Actigard® was applied 7 dpt, followed by inoculation with Pss.

These initial trials have signalled that non-copper products have potential to control Pss. **Next steps:** To validate the findings from both trials the plan is to re-screen these two products as well as other biobactericides in detached cherry shoot assays with a view to progress pot or field trials in the 2025-26 season.



**Figure 4.** Apical section of a detached cherry shoot after incubation with *Pseudomonas syringae* pv. *syringae* (Pss). (Hernandez et al. 2004).

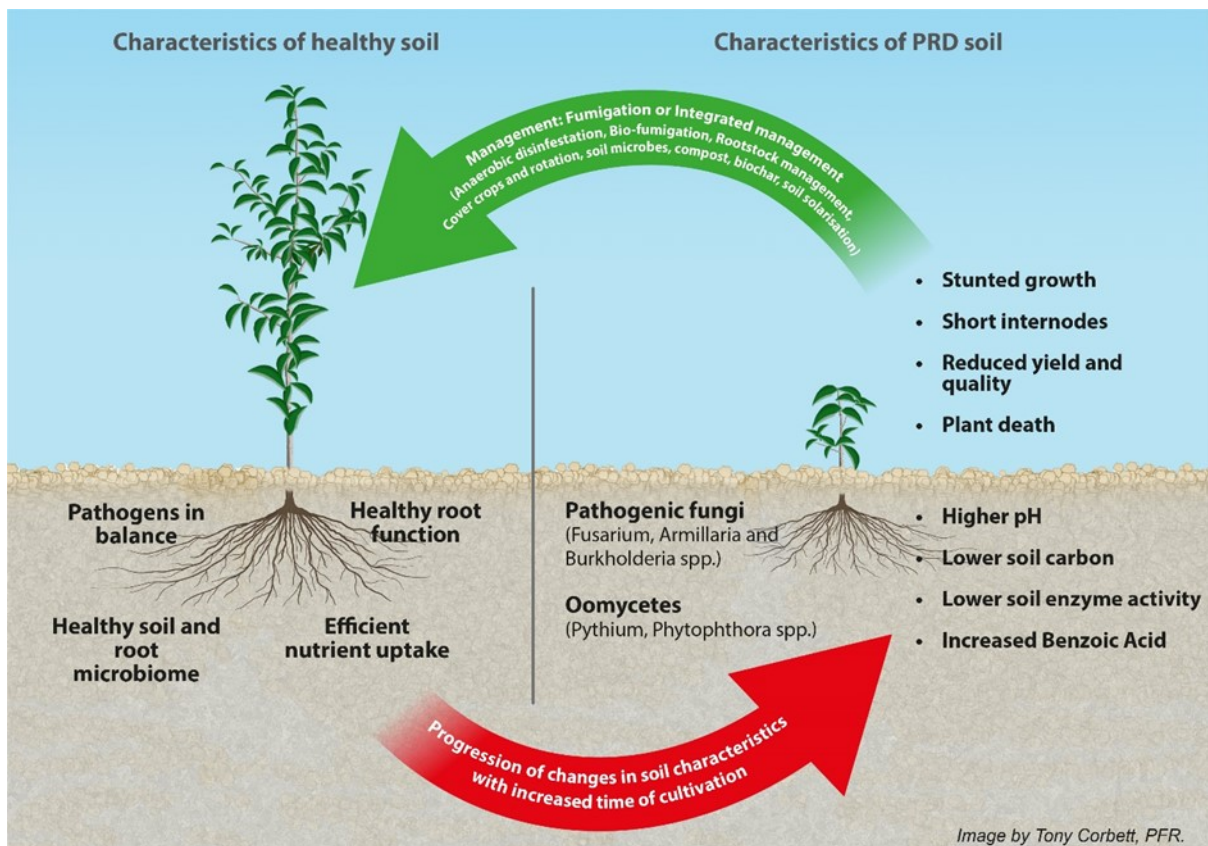
**Reports:** Hernandez L, Elmer P, Hedderley D, Marroni MV. March 2024. Efficacy of Timorex Gold® against *Pseudomonas syringae* pv. *syringae* (Pss), the cause of bacterial canker of cherry. A Plant & Food Research report prepared for: Summerfruit New Zealand. PFR SPTS No. 25224.

Marroni V, Visnovsky S, Colhoun K, Elmer P, Hedderley D. April 2024. Testing the efficacy of Actigard® against *Pseudomonas syringae* pv. *syringae* (Pss), the cause of bacterial canker on field sprayed cherry trees. A Plant & Food Research report prepared for: Summerfruit New Zealand. PFR SPTS No. 25355.

## Better understanding *Prunus* Replant disease

Replant disease is a widespread debilitating disease in intensively planted fruit orchards. Plant & Food Research recently completed a review of *Prunus* replant disease (PRD) for Summerfruit NZ. The review highlighted the complex number of factors that can cause replant disease, as well as the combination of management techniques that can be used (Figure 5). Soil fumigation was identified as being the most effective technique to control PRD. A technote has been produced from this review and is available to download from the SNZ Portal.

**Report:** Schurmann M, Applegate ER, Williams N, Breen KC. March 2024. Summerfruit New Zealand Replant Disease Review. A Plant & Food Research report prepared for: Summerfruit New Zealand. Milestone No. 100046. Contract No. 41956. Job code: P/416052/01. PFR SPTS No. 25292.



**Figure 5.** Illustration of the complex *Prunus* replant disease (PRD), highlighting its physical symptoms in the orchard, and the different management techniques (Schurmann et al. 2024).

## Research reports and resources

All reports for the project presented in this update are available on request. Email [research@summerfruitnz.co.nz](mailto:research@summerfruitnz.co.nz).

