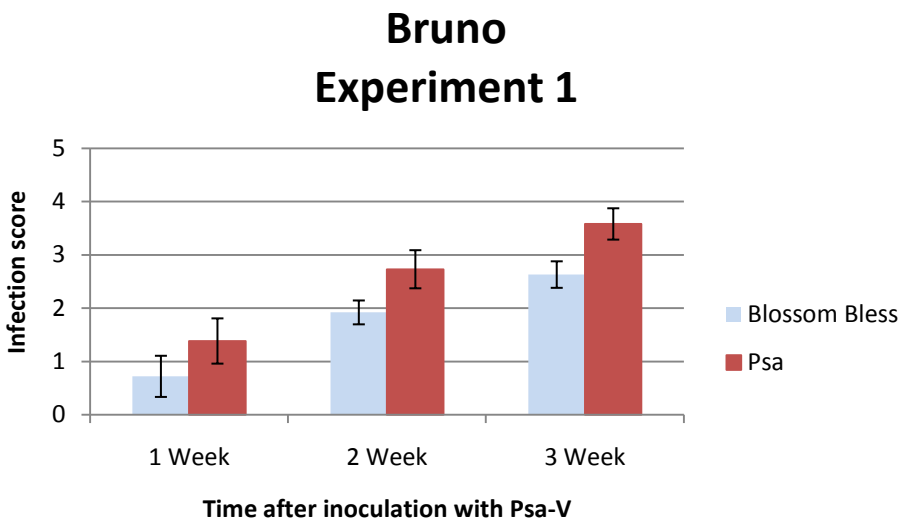
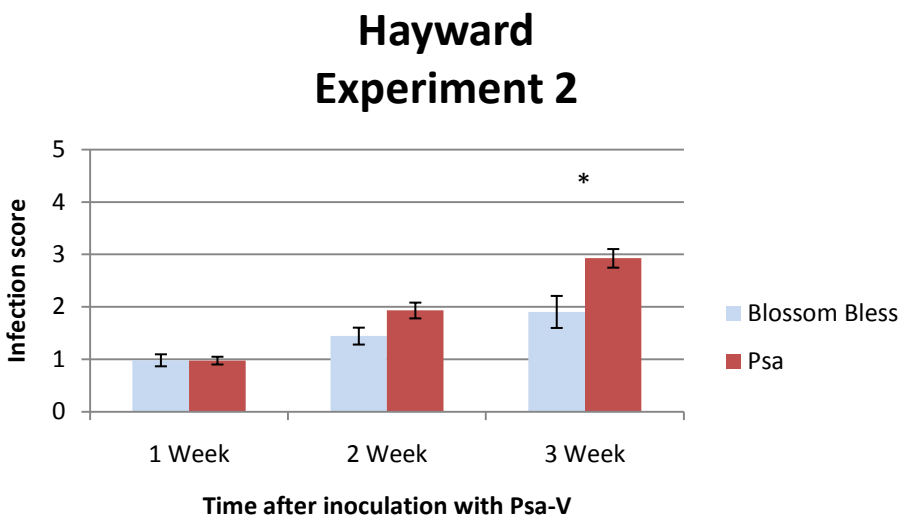
Product testing report

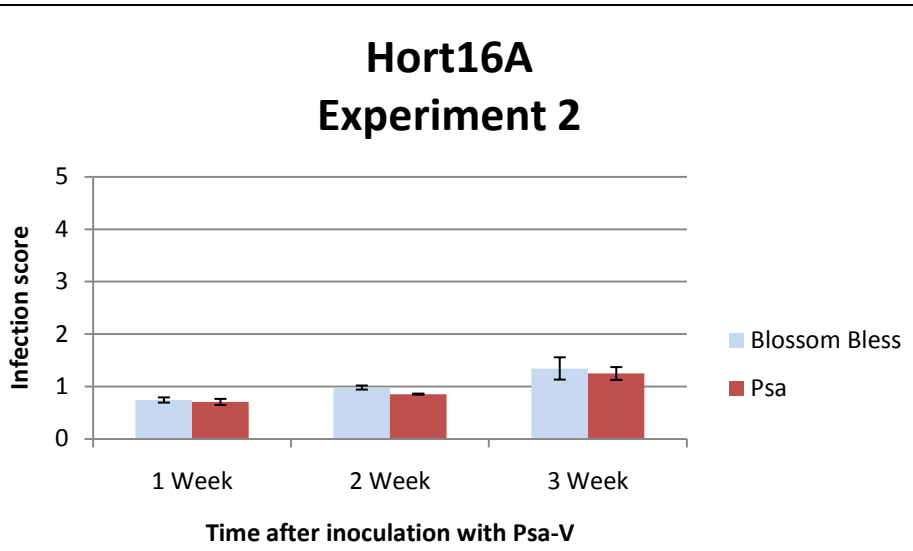
6 December 2011

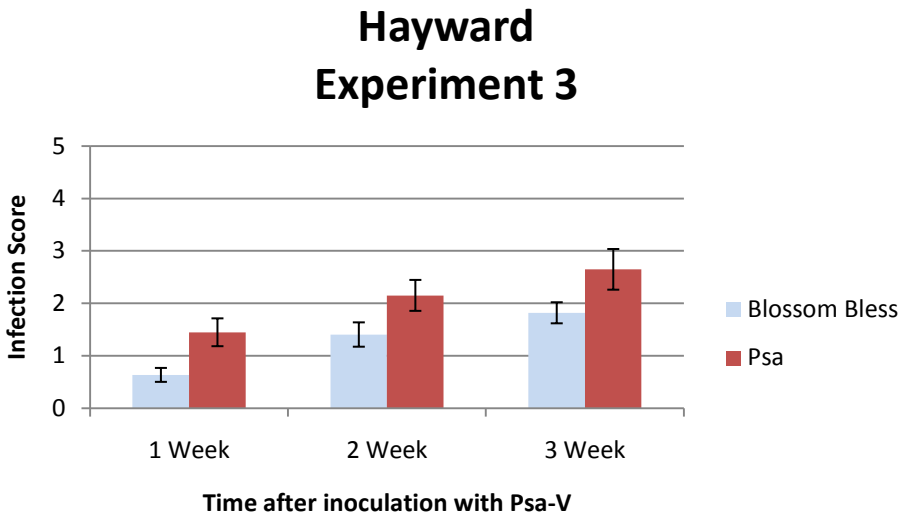
Blossom Bless			
Supplying company:	Agrinova NZ Limited		
Active ingredient:	*Pantoea agglomerans*		
Mode of action:	Protectant ☐	Biological ☒	Elicitor ☐
Application rate:	**Experiment 1:** 7.3 x 10^8 cfu ml^{-1} **Experiment 2:** 1.1 x 10^9 cfu ml^{-1} **Experiment 3:** 5.0 x 10^8 cfu ml^{-1} (These rates are higher than recommended label rates: 1.1 – 4.5 x 10^7 cfu ml^{-1})		
Recommended rate in kiwifruit (per 100L):	30g product		

Test results	
Test	**Greenhouse seedling tests**
Method description	**Experiment 1: Biological (9 June 2011 – 4 July 2011)** Bruno seedlings were treated once with Blossom Bless (7.3 x 10^8 cfu ml^{-1}) and inoculated one day later with Psa-V (at 10^9 cfu ml^{-1} concentration). Assessments were made at weekly intervals after inoculation. The degree of leaf spotting was determined visually using a 0 – 5 scale and is plotted as an 'Infection Score'. **Experiment 2: Biological (9 September 2011 – 4 October 2011)** Hayward and Hort16A seedlings were treated once with Blossom Bless (1.1 x 10^9 cfu ml^{-1}) and inoculated three days later with Psa-V (at 10^9 cfu ml^{-1} concentration). Assessments were made at weekly intervals after inoculation. The degree of leaf spotting was determined visually using a 0 – 5 scale and is plotted as an 'Infection Score'. **Experiment 3: Biological (26 October 2011 – 18 November 2011)** Hayward seedlings were treated once with Blossom Bless (5.0 x 10^8 cfu ml^{-1}) and inoculated two days later with Psa-V (at 10^8 cfu ml^{-1} concentration). Assessments were made at weekly intervals after inoculation. The degree of leaf spotting was determined visually using a 0 – 5 scale and is plotted as an 'Infection Score'.
Results Key: *0 = no leaf spotting* *1 = up to 10%* *2 = up to 25%* *3 = up to 50%* *4 = up to 75%*	**Experiment 1:** In Bruno seedlings, Blossom Bless reduced leaf spotting at one, two and three weeks after inoculation, however, differences were not significant. **Experiment 2:** In Hayward seedlings, Blossom Bless reduced leaf spotting, with significant reductions three weeks after inoculation. In Hort16A seedlings, Blossom Bless significantly increased leaf spotting two weeks after inoculation, however,

Plant & Food RESEARCH RANGAHAU AHUMĀRA KAI
The New Zealand Institute for Plant & Food Research Ltd
Tel: +64 9 925 7000
Fax: +64 9 925 7001

5 = 100% (of leaf area)	differences were not significant at the final assessment, three weeks after inoculation. **Experiment 3:** In Hayward seedlings, Blossom Bless reduced leaf spotting at one, two and three weeks after inoculation, however, differences were not significant.  





*** Psa inoculated control and the treatment are statistically significantly different at the 5% level**

Summary

At the final assessments, three weeks after inoculation with Psa-V, single applications of Blossom Bless reduced leaf spotting in Bruno and Hayward seedlings, with significant reductions in Hayward (experiment 2). In Hort16A seedlings, Blossom Bless had little effect on leaf spotting by the final assessment. Experiment 4 trialled a lower inoculum load as earlier experiments had used high Psa-V inoculum loads, preventing the correct ratio of biological control agent: bacterial load. The lower inoculum load did not appear to increase the efficacy of Blossom Bless. Blossom Bless has demonstrated greater potential for protecting flowers from Psa infection than reducing leaf spotting (refer to The New Zealand Kiwifruit Journal, Psa Scientific Edition, October 2011, p31-33; N.B. Blossom Bless is referred to as P10C in that article).

Comments

A standardised screening protocol has been used to test products for efficacy against Psa-V to enable a high throughput of products. Protectant, biological or elicitation tests may be performed, depending on the mode of action of the product. Protectant tests involve the product being applied to the plant with inoculation following on the same day, once the product has dried. Biological tests involve the product being applied two to three days prior to inoculation with Psa-V. Elicitation tests involve the product being applied to the plants seven to ten days prior to inoculation with Psa-V.

Assessments of leaf spotting are performed at weekly intervals after inoculation. This method has largely involved testing products using information provided on the product's label. In the future, products may be retested using protocols provided by supplying companies. Products which have previously shown some level of efficacy will be given priority for re-testing.

Data are presented for all assessment timings; however, evaluation of results is largely focussed on the final 'three week' assessment data. Disease symptoms will be better developed by this time and earlier assessments are considered to be less reliable. However, in the case of some elicitors, it is possible that the elicitation effect has been expended and that poor results at the 'three week' assessment time indicate reduced efficacy as a result of insufficient frequency of application.

Results from greenhouse trials primarily serve as a screening tool to determine products that will progress to field trials. Care should be taken when extrapolating results to field conditions. Results in the field may differ due to different environmental conditions and differences in plant material.

Note – leaf spotting may not necessarily mean the plant is infected. It simply indicates that the plant has been challenged by Psa.