

# Product testing report

07 May 2012

Actigard		
Supplying company:	Syngenta	
Active ingredient:	1, 2, 3 – benzothiadiazole 7 thiocarboxylic acid-S-methyl-ester	
Mode of action:	Protectant <input checked="" type="checkbox"/>	Biological <input type="checkbox"/> Elicitor <input checked="" type="checkbox"/>
Application rate:	<b>Experiment 1:</b> 140g per 100L <b>Experiments 2 &amp; 3:</b> 35g per 100L <b>Experiment 4:</b> 20g per 100L	

Test results	
Test	Greenhouse seedling tests
Method description	<p><b>Experiment 1: Protectant (9 June 2011 – 4 July 2011)</b> Bruno seedlings were treated once with the product one day prior to inoculation with Psa-V (at <math>10^9</math> cfu ml<sup>-1</sup> 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'.</p> <p><b>Experiment 2: Elicitors (4 August 2011 – 1 September 2011)</b> Hort16A seedlings were treated once with the product seven days prior to inoculation with Psa-V (at <math>10^9</math> cfu ml<sup>-1</sup> 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'.</p> <p><b>Experiment 3: Elicitors (30 August 2011 – 30 September 2011)</b> Hort16A, Hayward and Bruno seedlings were treated once with the product ten days prior to inoculation with Psa-V (at <math>10^9</math> cfu ml<sup>-1</sup> 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'.</p> <p><b>Experiment 4: Elicitors (7 March 2012 – 2 April 2012)</b> Bruno seedlings were treated once with the product seven days prior to inoculation with Psa-V (at <math>10^{10}</math> cfu ml<sup>-1</sup> 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'.</p>
Results	<p><b>Experiment 1:</b> In Bruno seedlings, Actigard applied as a protectant reduced leaf spotting, with significant reductions at the final assessment, three weeks after inoculation with Psa-V.</p> <p><b>Experiment 2:</b> In Hort16A seedlings, Actigard applied as an elicitor reduced leaf spotting, with significant reductions at the assessments one and two weeks after inoculation</p>
Key:	<p>0 = no leaf spotting            1 = up to 10%            2 = up to 25%            3 = up to 50%            4 = up to 75%</p>

5 = 100%  
(of leaf area)

with Psa-V.

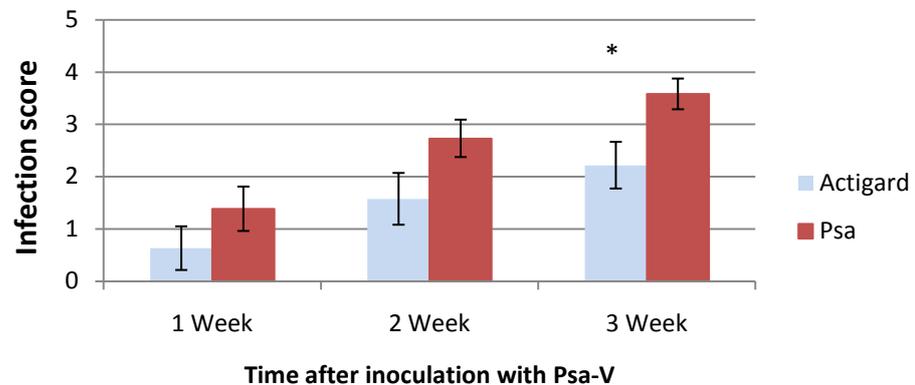
### Experiment 3:

Actigard applied as an elicitor significantly reduced leaf spotting in Hort16A, Hayward and Bruno seedlings at all assessments; one, two and three weeks after inoculation with Psa-V.

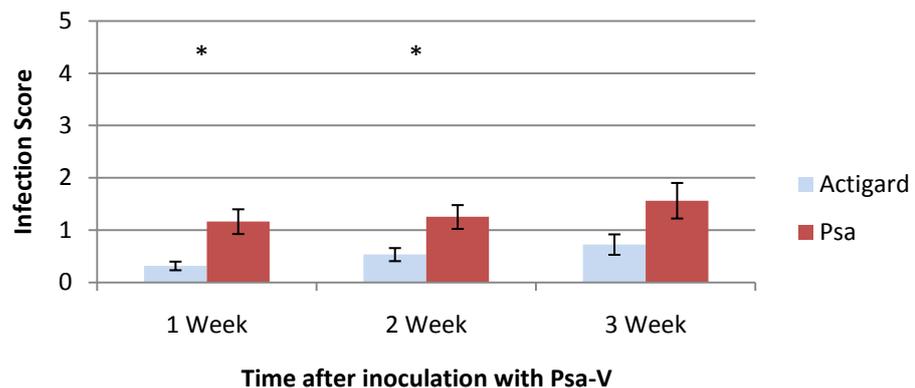
### Experiment 4:

Actigard applied as an elicitor significantly reduced leaf spotting in Bruno seedlings one and three weeks after inoculation with Psa-V.

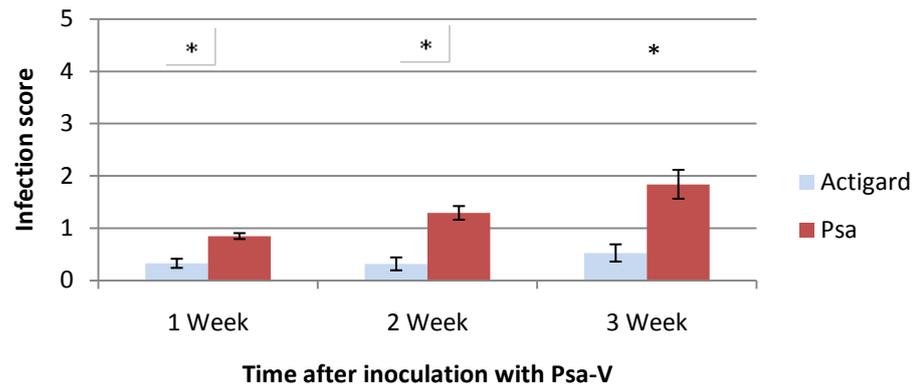
## Bruno Experiment 1



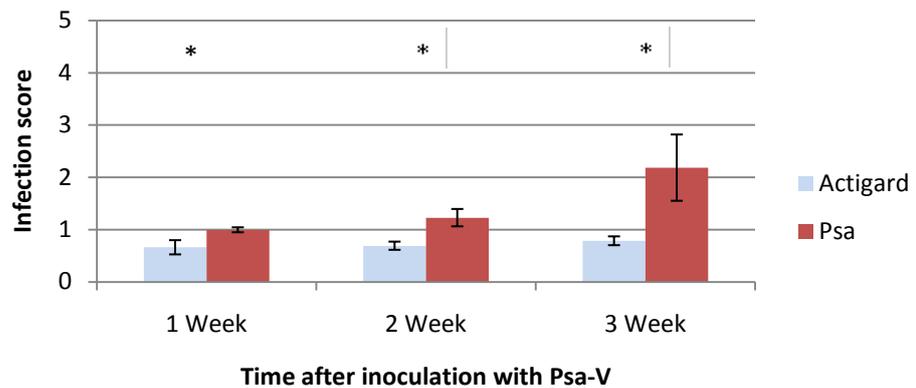
## Hort16A Experiment 2



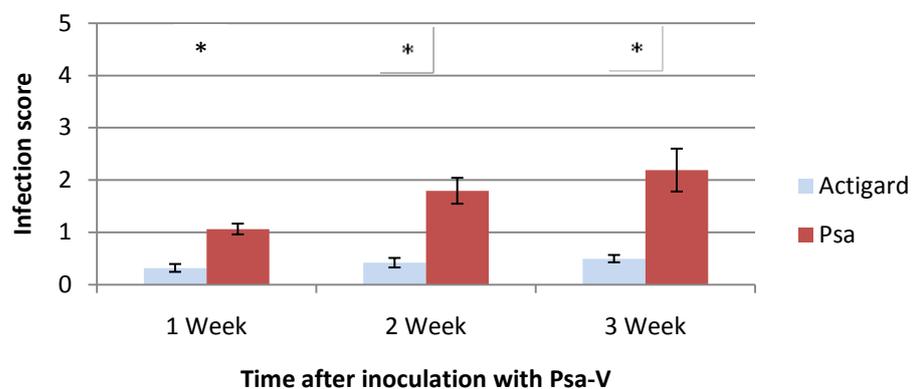
## Hort16A Experiment 3



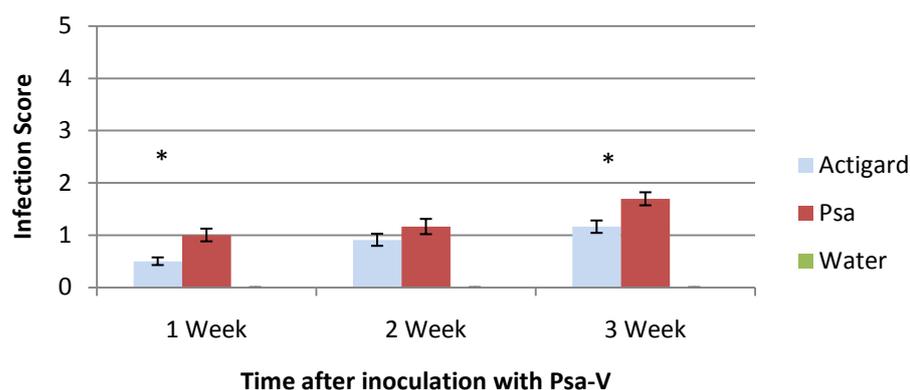
## Hayward Experiment 3



## Bruno Experiment 3



## Bruno Experiment 4



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

### Summary

At the final assessment three weeks after inoculation with Psa-V, a single application of Actigard ( $1.4\text{g L}^{-1}$ ) applied to Bruno seedlings one day prior to inoculation significantly reduced leaf spotting. Single applications of Actigard ( $0.35\text{g L}^{-1}$ ) to Hort16A, Hayward and Bruno seedlings seven or ten days prior to inoculation with Psa-V reduced leaf spotting, with significant reductions in all cultivars in experiment 3. Actigard (rate) applied to Bruno seedlings in experiment 4 also significantly reduced leaf spotting. Actigard has demonstrated promising results, repeatedly reducing leaf spotting in seedling trials following inoculation with Psa-V. ACVM approval has been obtained for limited use.

### Comments

A standardised screening protocol has been used to test products for efficacy against Psa-V to enable a high throughput of products. Protectant 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. 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.**

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