

# Product testing report

21 December 2011

Nordox 75WG		
Supplying company:	Gro-Chem	
Active ingredient:	Copper oxide	
Mode of action:	Protectant <input checked="" type="checkbox"/>	Biological <input type="checkbox"/> Elicitor <input type="checkbox"/>
Application rate (per 100L):	Multiple	
Recommended rate in kiwifruit (per 100L):	55 to 70g	

Test results	
Test	Greenhouse seedling tests
Method description	<p><b>Experiment 1: Protectant (10 June 2011 – 4 July 2011)</b> Bruno seedlings were treated once with the product, allowed to dry and inoculated with Psa-V (at <math>10^9</math> cfu ml<sup>-1</sup> concentration). Nordox 75WG was applied at 3g L<sup>-1</sup>, partnered with Omniwett or Duwett at 1ml L<sup>-1</sup>. 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: Protectant (24 August 2011 – 4 September 2011)</b> Bruno seedlings were treated once with the product, allowed to dry and inoculated with Psa-V (at <math>10^9</math> cfu ml<sup>-1</sup> concentration). Nordox 75WG was applied at 0.7g or 1.4g L<sup>-1</sup>, partnered with Latron (non-ionic surfactant) at 2ml L<sup>-1</sup>. 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: Protectant (20 September 2011 – 6 October 2011)</b> Hort16A seedlings were treated once with the product and inoculated two days later with Psa-V (at <math>10^9</math> cfu ml<sup>-1</sup> concentration). Nordox 75WG was applied at 0.38g or 0.75g L<sup>-1</sup>, with or without the addition of Duwett at 0.33ml or 0.66ml L<sup>-1</sup>. 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: Protectant (24 November 2011 – 15 December 2011)</b> Hort16A seedlings were treated once with the product (0.7g L<sup>-1</sup>), allowed to dry and inoculated 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>

## Results

Key:

0 = no leaf

spotting

1 = up to 10%

2 = up to 25%

3 = up to 50%

4 = up to 75%

5 = 100%

(of leaf area)

### Experiment 1:

In Bruno seedlings, Nordox 75W ( $3\text{g L}^{-1}$ ) partnered with Omniwett significantly reduced leaf spotting one, two and three weeks after inoculation. Nordox 75W ( $3\text{g L}^{-1}$ ) partnered with Duwett reduced the degree of leaf spotting, though not significantly.

### Experiment 2:

In Bruno seedlings, Nordox 75W ( $0.7\text{g L}^{-1}$ ) partnered with Latron had little affect on the degree of leaf spotting. Nordox 75W ( $1.4\text{g L}^{-1}$ ) partnered with Latron reduced leaf spotting at two and three weeks after inoculation, however, reductions were not significant.

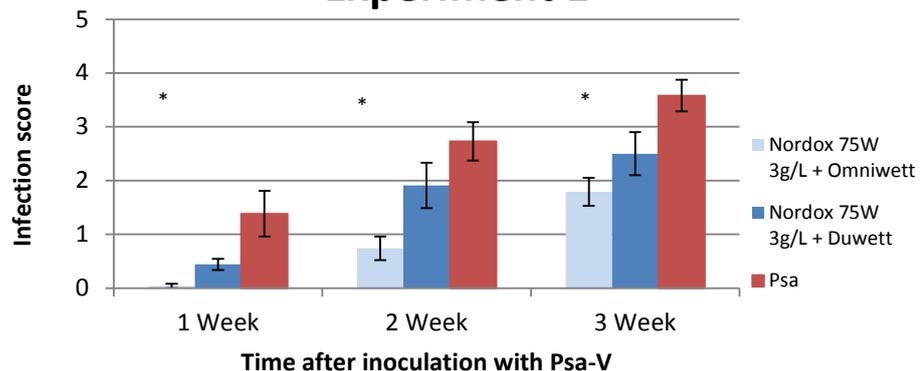
### Experiment 3:

In Hort16A seedlings, Nordox 75W applied at  $0.75\text{g L}^{-1}$  or  $0.38\text{g L}^{-1}$ , with or without the addition of Duwett, did not affect leaf spotting one week after inoculation. Two weeks after inoculation all treatments significantly increased leaf spotting, apart from Nordox 75W applied at  $0.75\text{g L}^{-1}$  alone.

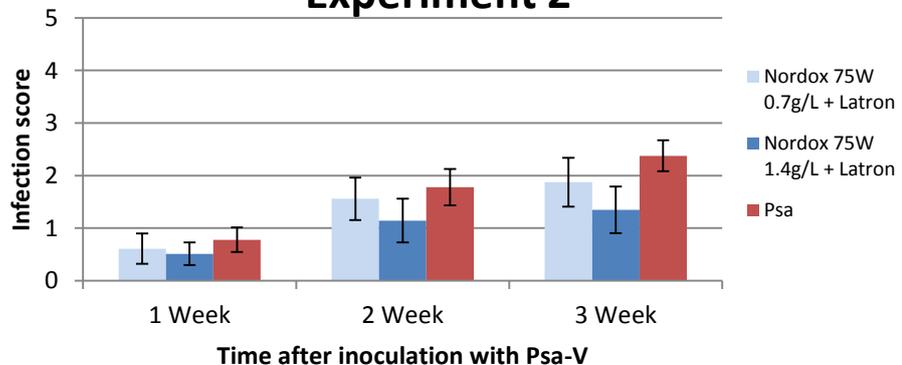
### Experiment 4:

In Hort16A seedlings, Nordox 75W did not affect leaf spotting following inoculation with Psa-V.

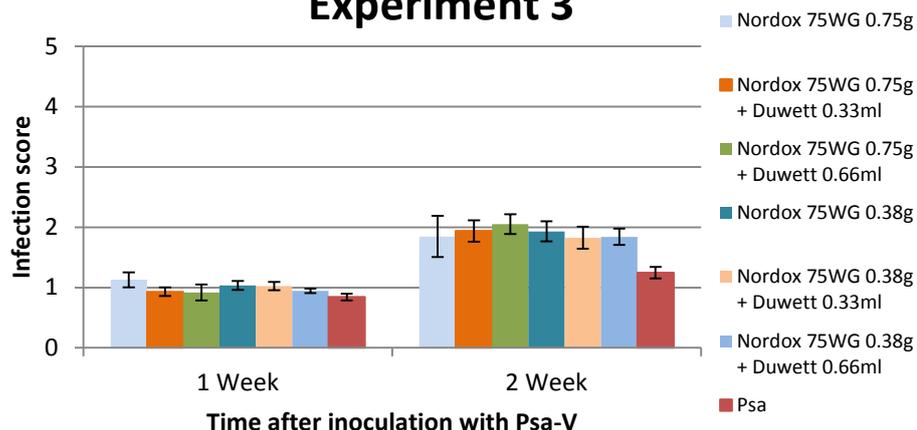
## Bruno Experiment 1



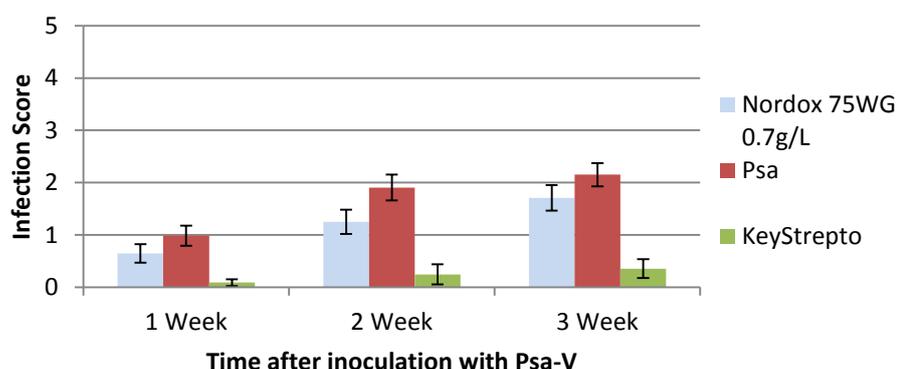
## Bruno Experiment 2



## Hort16A Experiment 3



## Hort16A Experiment 4



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

## Summary

In experiments 1 and 2 leaf spotting was reduced though reductions were only significant when Nordox 75W was combined with Omniwett. In experiment 1, Nordox 75W was accidentally applied at three times the recommended product label winter rate, this rate is not recommended. In Hort16A seedlings, Nordox 75W either increased leaf spotting (experiment 3) or had no effect (experiment 4). Increased leaf spotting in seedlings treated with Nordox 75W partnered with Duwett may be caused by Duwett increasing run-off, resulting in insufficient active ingredient being deposited on the leaves. Experiments demonstrated inconsistent results; however, trends observed in experiment two are consistent with results in the field observed last season. Nordox 75W is being included in field trials.

## 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.**

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