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How to control *Pseudomonas syringae* pv *actinidiae*

Joel L.Vanneste

Te Puke 5 October 2011

Glasshouse testing



Glasshouse testing



- Several hundred products to be tested
- Prioritisation

Glasshouse testing



- Several hundred products to be tested
- Prioritisation

Market Access Potential (post or pre flowering restrictions)

Commercial Potential - Availability as an agrichemical formulation:

Regulatory Status in NZ: (ACVM)

CPP Status - Status in ZESPRI Crop Protection Programme:

Expected Efficacy in Class - Relative efficacy expected within product class

Glasshouse testing



- Several hundred products to be tested
- Prioritisation
- Different modes of action (direct action, biological control agents, elicitors)
- High through put and high level of inoculum (seedlings, glasshouse,)

Assessment



1 = 10 %



2 = 25 %



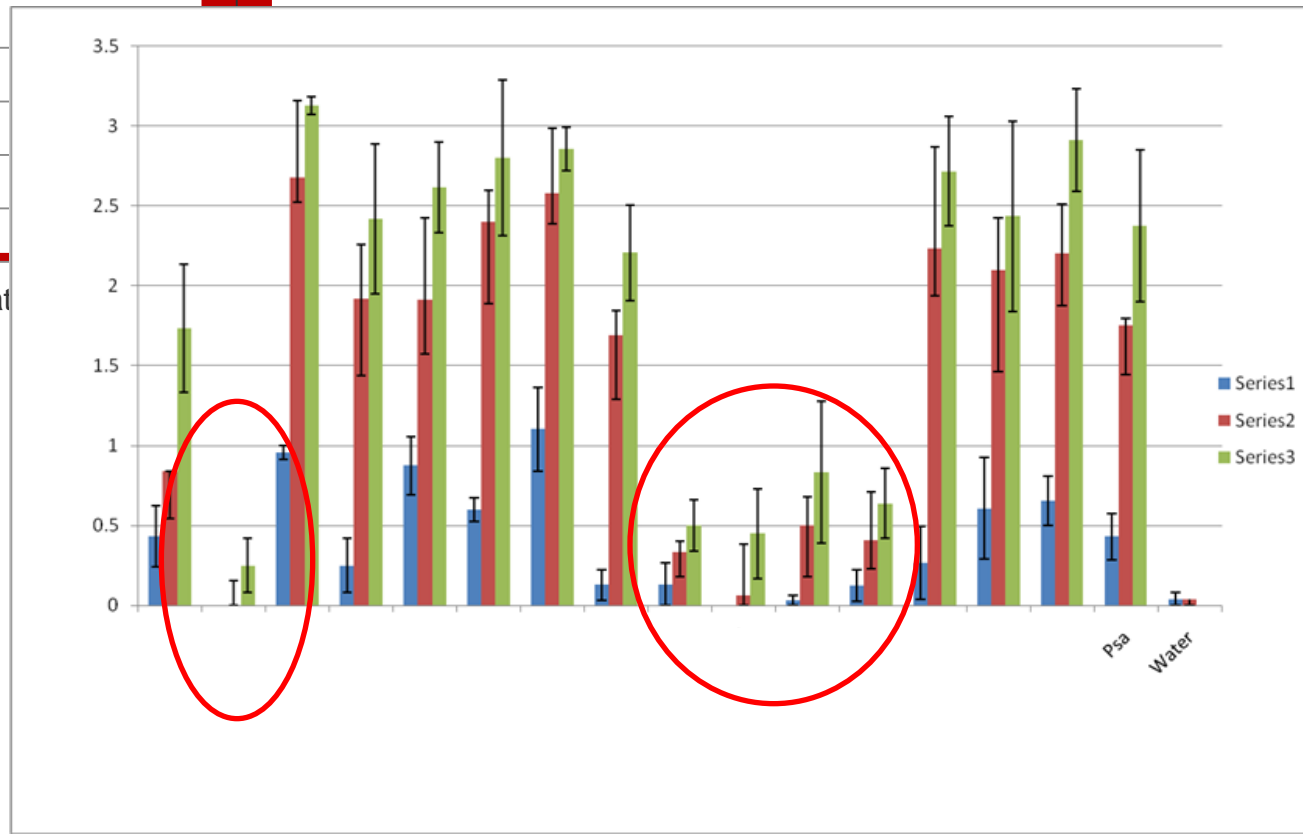
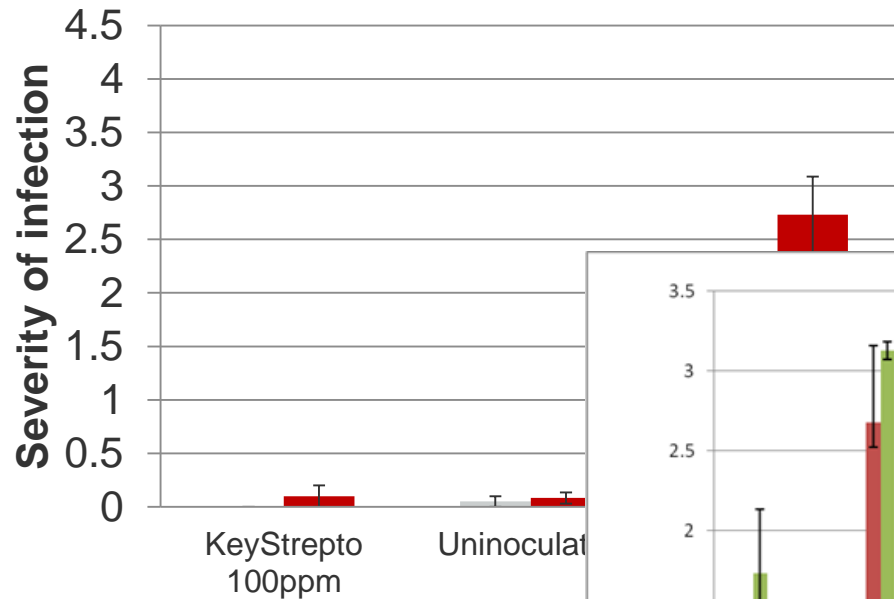
3 = 50 %



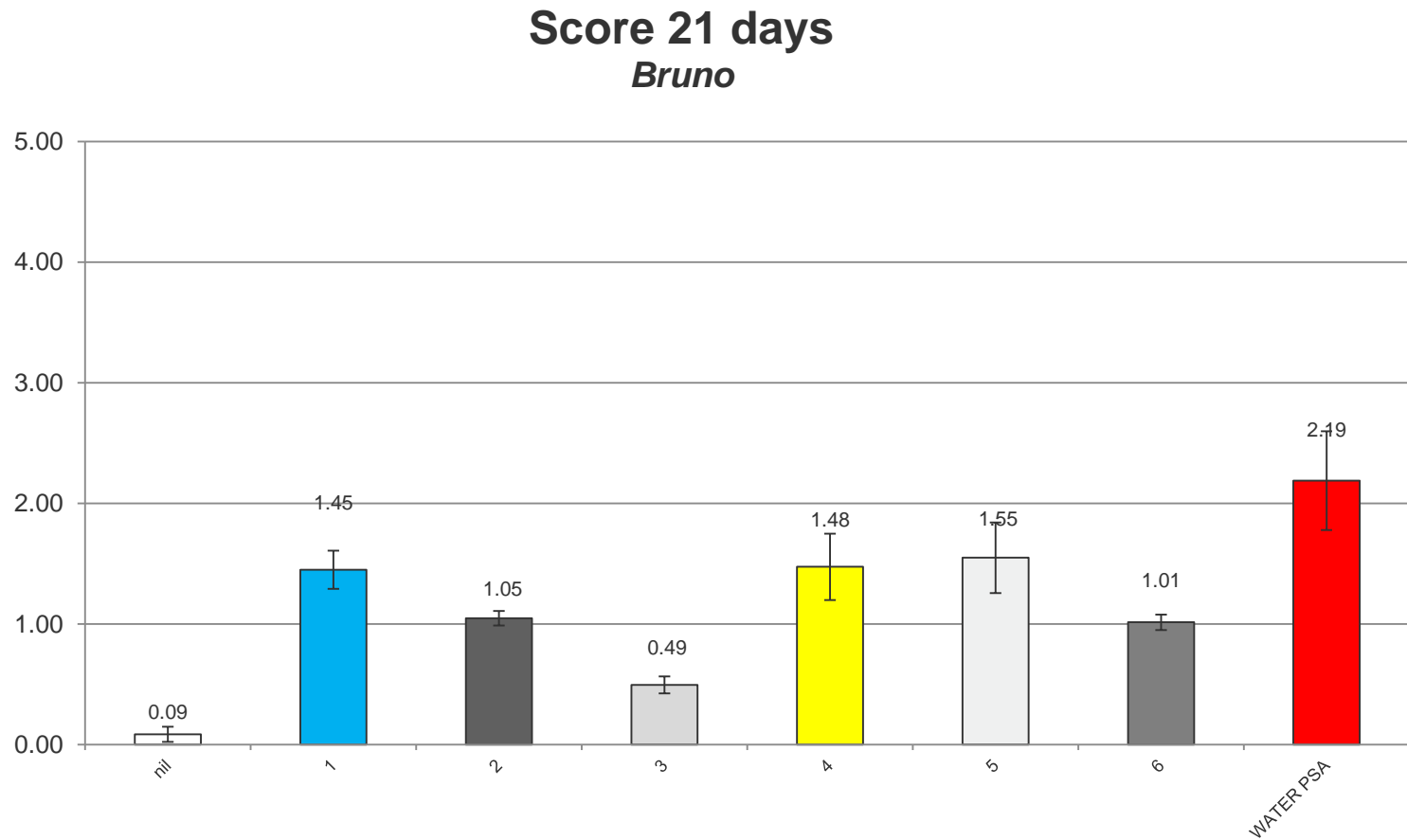
4 = 75 %

Antibiotics

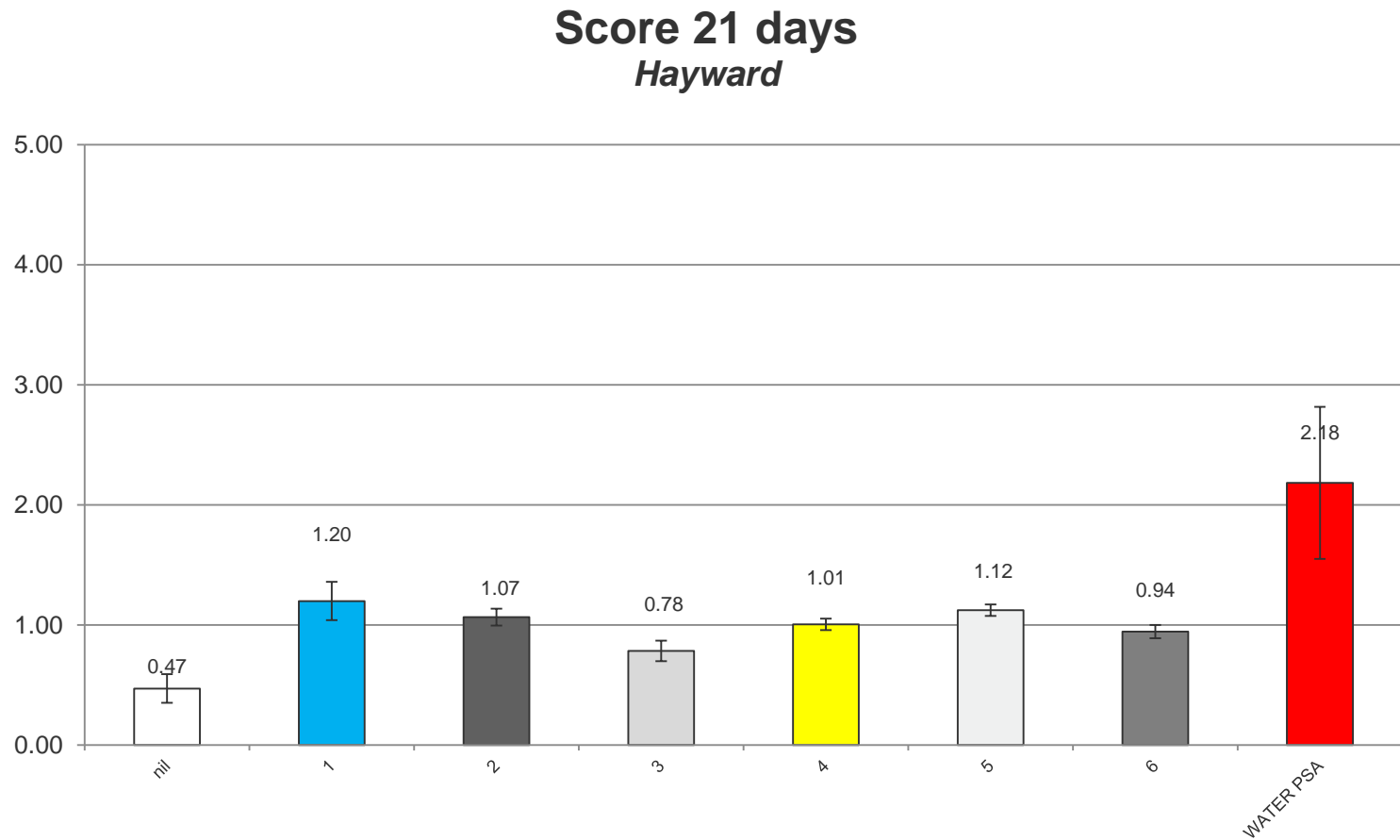
KeyStrepto treatment



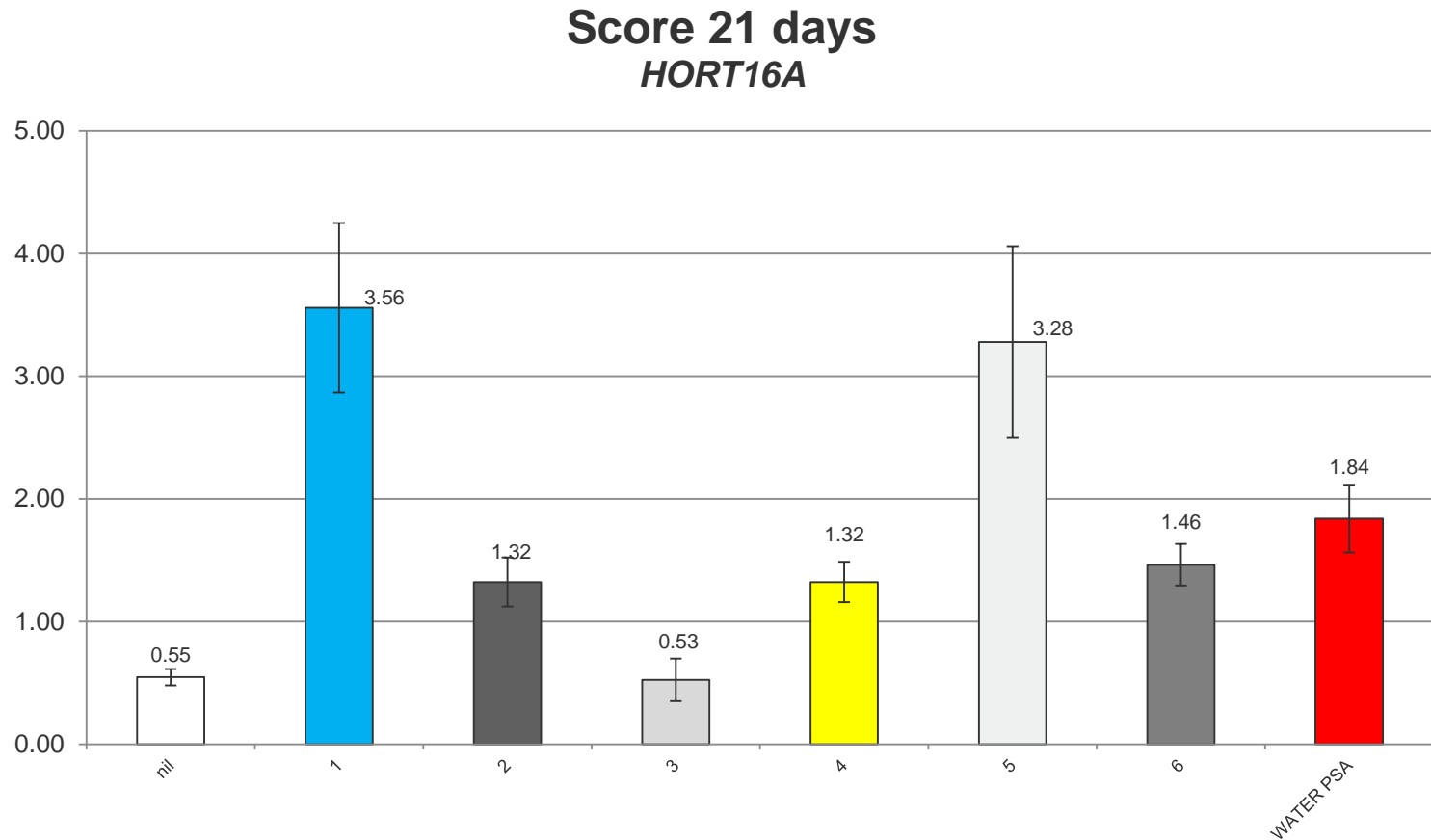
Elicitors on Bruno seedlings



Elicitors on Hayward seedlings



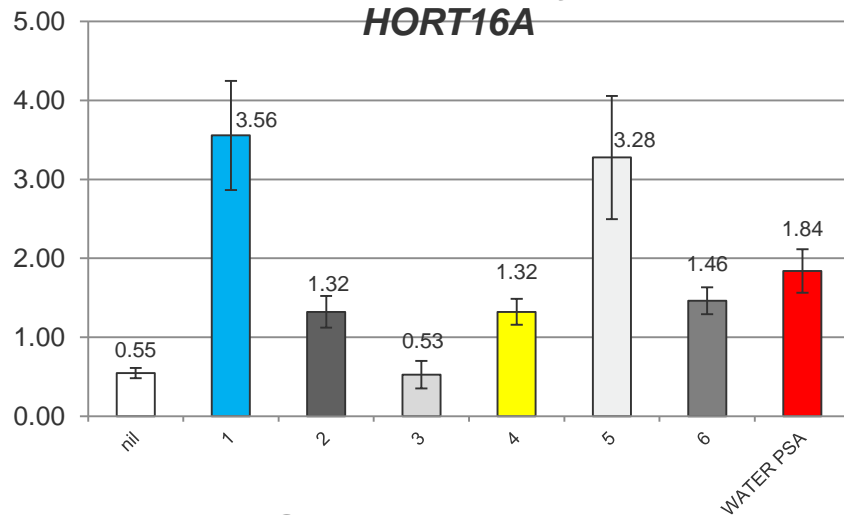
Elicitors on Hort16A seedlings



Elicitors

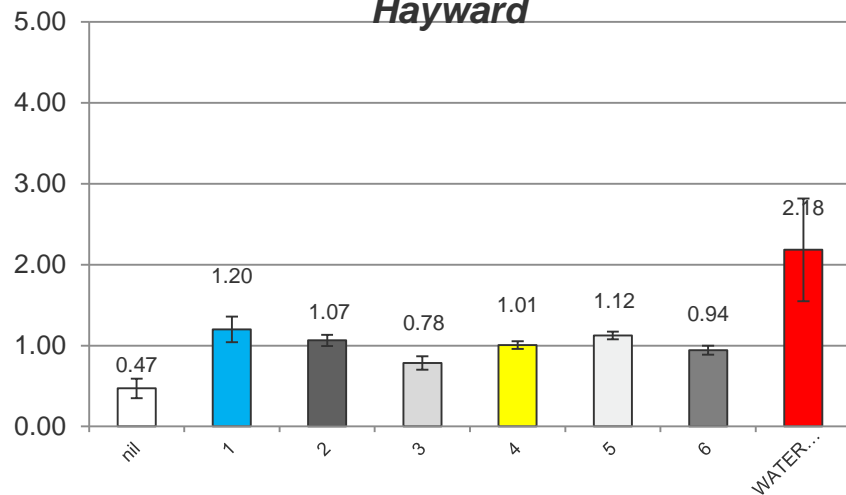
Score 21 days

HORT16A



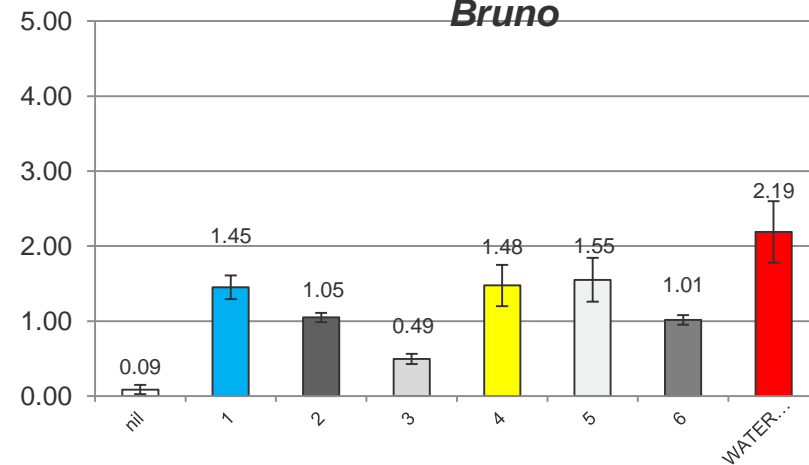
Score 21 days

Hayward

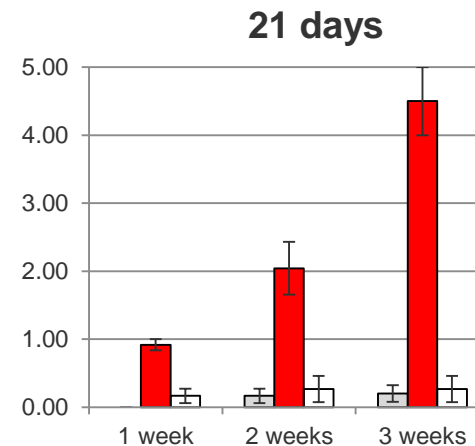
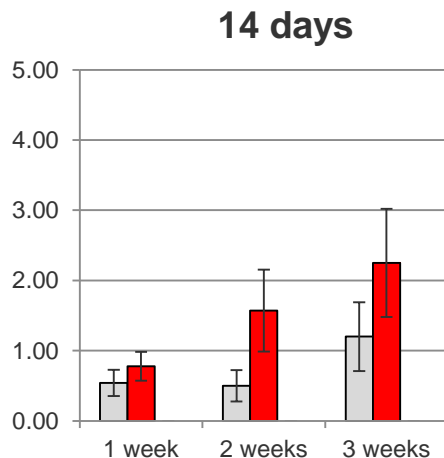
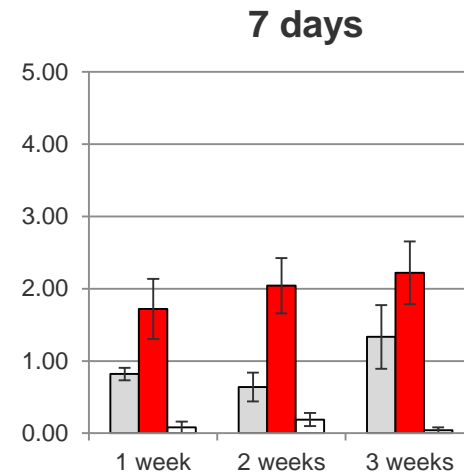
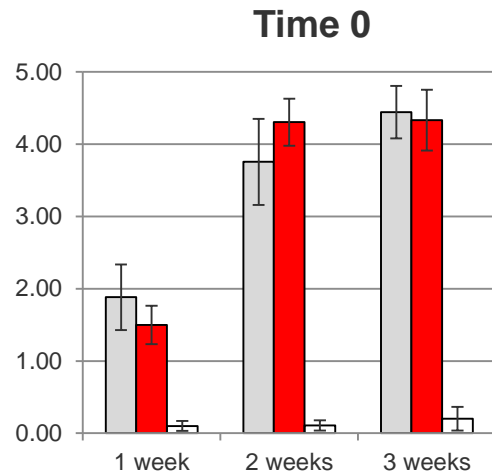


Score 21 days

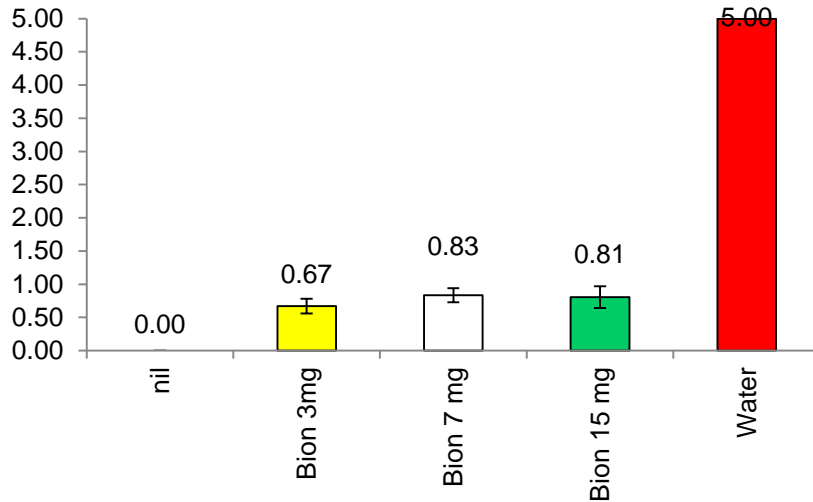
Bruno



Reduction of leaf spots on 'Bruno' seedlings treated with Actigard (7 mg) (root application).



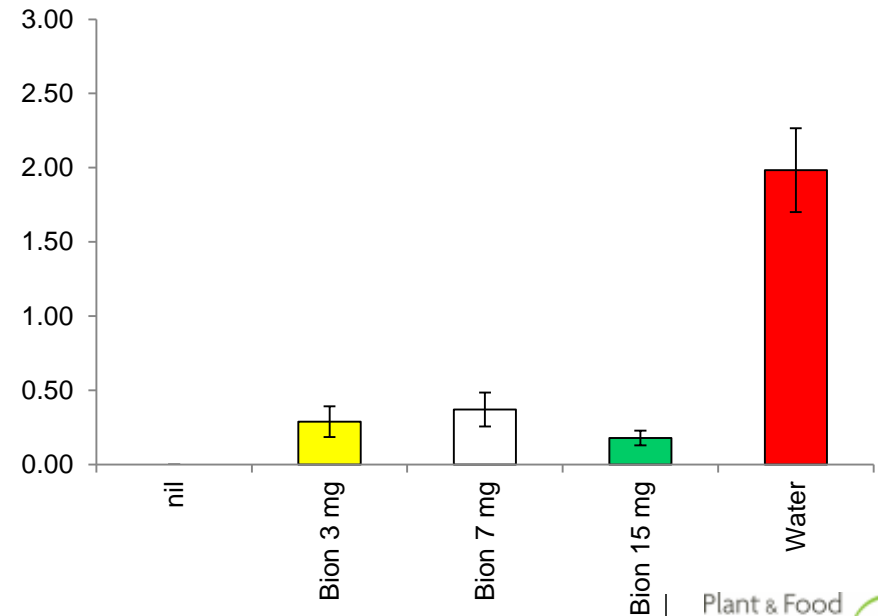
Control of Psa with Actigard as a root drench or as a foliar spray



L. Fiorentini, J.L. Vanneste, F. Spinelli 2011

Actigard used a root drench

Actigard used a foliar spray



Systemic assay: bringing the product in the plant





Trunk Injection Research Update

Joel Vanneste Shane Max



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Products trialed

Key Strepto (multiple sites with ACVM trial approval)

Chelated Coppers - Chebal Kubig and Phytion

Aliette (Al Fosetyl)

Teracep (acetic acid paracetic acid, hydrogen peroxide)

Biological- Serenade Max

Other proprietary products



Trials undertaken on a range of sites including

- » Cut stumps
- » Leaf spotted vines
- » Non leaf spotted vines in infected orchards
- » All trials set up with randomised trial designs with single vine plots and typically ten vines per rep.
- » Both Stemshot and Sidwinder used
- » Applications in autumn and winter (predominantly just prior to leaf fall)

Results to date

Products	Hort16A		
Key Strepto™ Trial 1 Trial 2 Trial 3 Trial 4	2 x sites - Blocks now cut 1 x site - secondary symptoms seen 1 x site - to be assessed		
Chelated Copper Products	Widespread secondary infections seen in all sites		
Serenade Max®	Wide spread secondary infections in all sites		
Aliette®	Widespread secondary infections in all sites		
Other Proprietary Products	To be assessed		

To date 3 sites have had vines cut back to stumps by owner and an additional one likely to be

Results to date

Products	Hort16A	G9	
Key Strepto™ Trial 1 Trial 2 Trial 3 Trial 4	2 x sites - Blocks now cut 1 x site - secondary symptoms seen 1 x site - to be assessed	No secondary symptoms seen yet in tmt or controls	
Chelated Copper Products	Widespread secondary infections seen in all sites	No secondary symptoms seen yet in tmt or controls	
Serenade Max®	Wide spread secondary infections in all sites	No secondary symptoms seen yet in tmt or controls	
Aliette®	Widespread secondary infections in all sites	No secondary symptoms seen yet in tmt or controls	
Other Proprietary Products	To be assessed	To be assessed	

To date 3 sites have had vines cut back to stumps by owner and an additional one likely to be

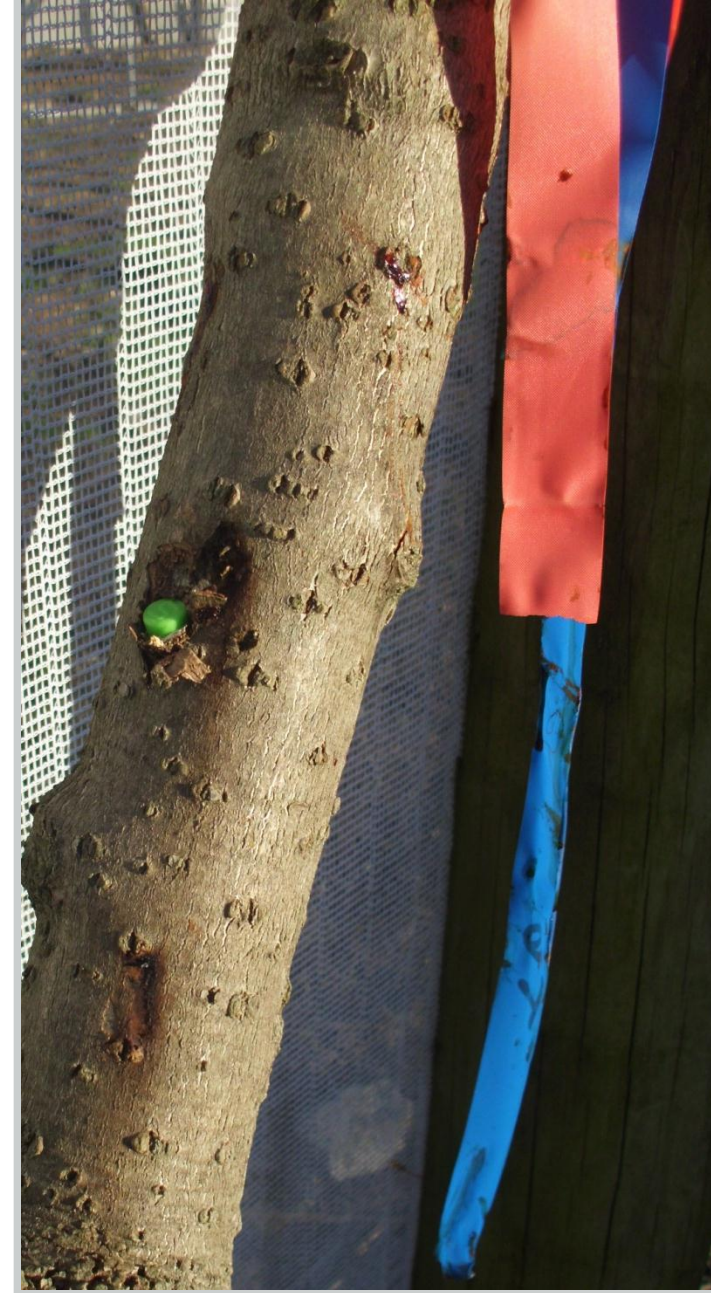
Results to date

Products	Hort16A	G9	Hayward
Key Strepto™ Trial 1 Trial 2 Trial 3 Trial 4	2 x sites - Blocks now cut 1 x site - secondary symptoms seen 1 x site - to be assessed	No secondary symptoms seen yet in tmt or controls	Spring applications pending
Chelated Copper Products	Widespread secondary infections seen in all sites	No secondary symptoms seen yet in tmt or controls	Spring applications pending
Serenade Max®	Wide spread secondary infections in all sites	No secondary symptoms seen yet in tmt or controls	
Aliette®	Widespread secondary infections in all sites	No secondary symptoms seen yet in tmt or controls	
Other Proprietary Products	To be assessed	To be assessed	To be assessed

To date 3 sites have had vines cut back to stumps by owner and an additional one likely to be

Why No Success?

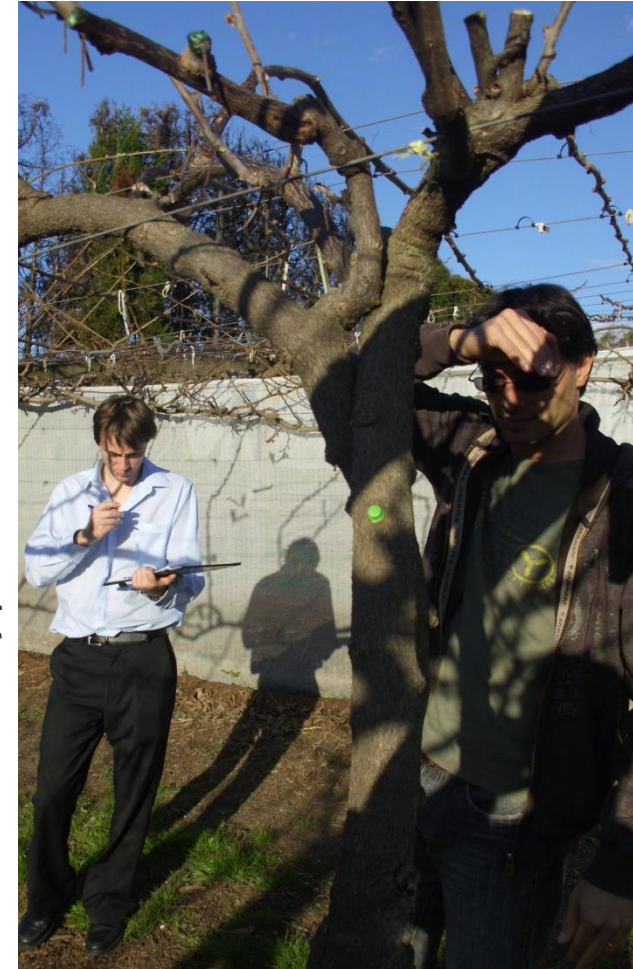
- » Product rates and volumes ?
- » Persistence within vine ?
- » Timing of injections ?
- » Ability to circulate throughout the vine?
- » Other ?



Where to from here

- » Remaining trials sites will continue with spring applications and further assessments
- » Refine technique-
 - » Lower pressure devices – Sidewinder
 - » Multiple injection sites
 - » Higher rates
- » Additionall projects
 - » Omnia- understand product movement

Please note – it is illegal to inject antibiotic without ACVM approval



Conclusions

- Product testing project aims at selecting winners
- Streptomycin the most consistent product but not the silver bullet
- Elicitors are not all equivalent
- Spraying will help in preventing infection
- Could injection help in curing infection?

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