Serenade® Prime in potatoes demonstration

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Purpose: Demonstration trial to look at Serenade Prime as product to increase marketable potatoes and uniformity in tuber size through two applications during the growing season
Location: NE Dandaragan
Soil Type: Sandy duplex
Growing Season Rainfall (April- October 2015): 450 mm

BACKGROUND SUMMARY

- The science behind biological products has not always been robust and previous attempts to measure their effects on product quality and gross margin has been challenging. Bayer Crop Science has been heavily investing in the biologics space to identify and deliver new options for growers and deliver scientific rigour around these products potential benefits to ensure they deliver more repeatable results.
- Serenade Prime is a product based on the beneficial bacteria *Bacillus subtilis* strain QST713, specifically selected by Bayer for its superior performance in cropping systems. In each container of Serenade Prime there is a guaranteed quantity of viable spores of the bacteria *Bacillus subtilis* strain QST713 as well as a complex mixture of plant-supportive biochemical which the bacteria produce and it is specifically formulated for soil application.
- Serenade Prime is designed to be used early in the crop as an inoculating agent to build the soil/root/microbe inter-relationships in the rhizosphere. Other Serenade formulations using QST713 are registered around the world to increase soil and plant health with foliar applied products delivering leaf activity on some foliar pathogens.
- In this trial Serenade Prime did not result in an increase of total yield but recorded an improved number of 'marketable' potatoes from the treatment through the reduction of smaller tubers and a higher percentage of medium sized, premium tubers.
- Improved tuber consistency in the premium size classes will generally lead to an increase in gross margin but this is dependent on a number of factors including pack shed pricing and also market demand for various grades of potatoes in the markets both in WA and over east.

TRIAL DESIGN

Plot size: 0.12 ha
Machinery use: Grimme planter with in-furrow applicator second application with boom spray
Repetitions: 1
Crop type and varieties used: Ware
Seeding rates and dates: 5 t/ha early May
Fertilizer rates and dates: 2 t/ha broadcast up front 500 kg/ha at hilling
Herbicide rates and dates: spray seed at 10% emergence 3 l/ha reglone at spray off 3 l/ha
Application A: 27/04/2016 @7 L/ha - Infurrow at planting with Confidor Guard & Amistar
Application B: 17/05/2016 @7 L/ha - Prior to hilling
Date of processing: Serenade - 27/09/2016 Untreated - 28/09/2016

RESULTS/STATISTICS

Table 1: Net weights & % Pack grade of ware potatoes treated comparing Serenade Prime treated to Untreated

			Net weight (kg)				% of Packing grade		
Class	**Size (g)**	**Packing grade**	**Serenade Prime**	**Untreated**	**Difference**	**% Change**	**Serenade Prime**	**Untreated**	**% Change**
Class 1	180	Select	1428	715	713	199.72	17.5	8.7	8.7
	140	Woolworths pre-pack	1433	1015	418	141.18	17.5	12.4	5.1
	90	Pre-pack	2539	2257	282	112.49	31.1	27.6	3.5
	30-90	Gourmet	1818	2027	-209	89.68	22.2	24.8	-2.5
	<30	Chats	958	1176	-218	81.46	11.7	14.4	-2.7
Plain	<30	Chats Plain grade	0	994	-994	0	0.0	12.1	-12.1
		Total weight	**8176**	**8184**	**-8**		**100**	**100.0**	

Once the trial was harvested, pack shed data was used to form the results (Table 1 & Figure 1). As highlighted above, the plain grade total weight was lower in the treated area than the UTC, as were the chats and the gourmet. The larger tubers which normally fetch a premium demonstrated an increase in weight in the treated area. In terms of packing grade there was a 3.5-8.7% increase in tuber weights from 90-180g and a 2.5-12.1% decrease in tuber weights from <30-90g. There was a minimal difference in total yield delivered to the shed compared to the UTC. Comments were made at the shed about improved skin finish from the Serenade treatment.

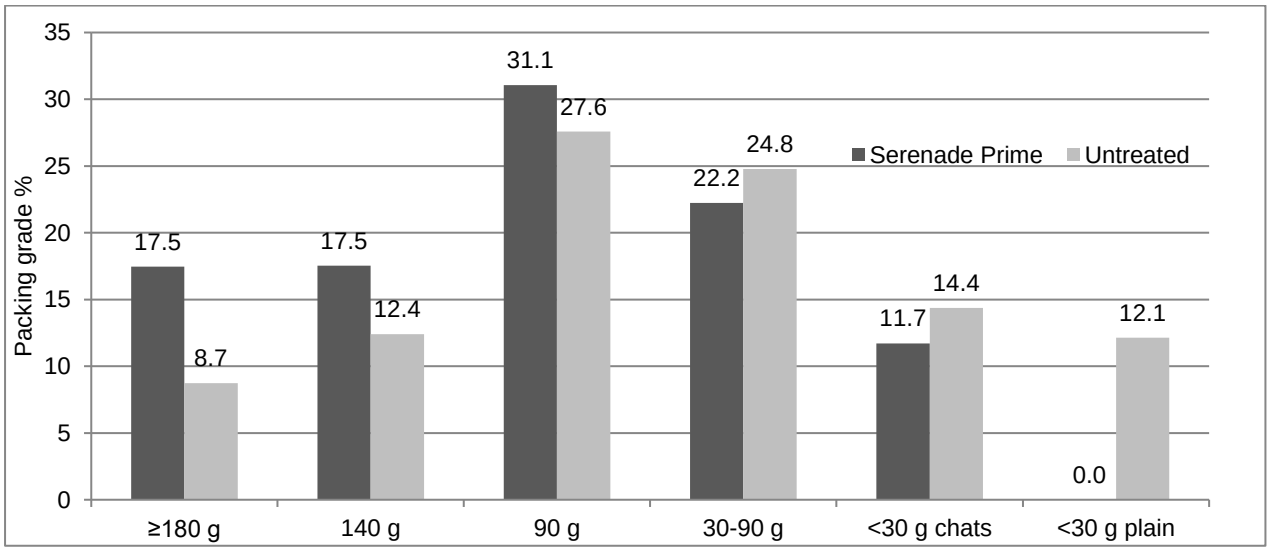

Figure 1: % Packing grade % of ware potatoes comparing Serenade Prime treated to untreated

OBSERVATION/ DISCUSSION/ MEASUREMENTS

In the field the ability for the QST713 strain to colonise the root zone and improve the active interface between the soil, plant roots, bacteria and some of the exudate biochemical has been widely recorded. This delivers benefits across a wide range of crops (in WA benefits have been recorded in avocado, citrus, potato and leafy greens trials to date) with increases in nutrient levels in leaves and fruit to assist quality and shelf life among the improvements

recorded. The application timing of the product is vital across crop type in order to achieve effective root colonisation. Generally timing should coincide with root flush timings for the respective crop but will also be influenced by the following factors:

- Crop type and season length
- Application method
- Irrigation frequency and volume
- Pests to be targeted

As a crop health product in horticulture, more research must be done and as grower experience increases with the product we will find out its BMP and how to best apply within different systems to get the optimum results.
Benefits to look for in potatoes are:

- Yield consistency
- Tuber size and grade %
- Skin finish
- Shelf life

The defining element that governs $ROI/ha in the trial is the pack shed pricing for various potato grades. This will fluctuate as will the demand for various grades which can see some of the results above skewing the $ROI. An example is a higher price for gourmet, chats and plain grade in 2016 due to shortages on the east coast which would cause the lower three grades to lose money in the trial as compared to the treated but overall the GM would still be positive.

PAPER REVIEWED BY:
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