



RUSTICA Hi-K ONION FERTILISER

TRIAL 2018-2019

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Background

- In the growing season of 2018 - 2019, we installed two replicated plot trials to measure the optimum rate of additional fertiliser topdressing for dry bulb onion production in Canterbury.
- These two trials were installed at two different sites. Both properties are owned and managed by the Webster family.



Belmont Farm, Aylesbury (near Christchurch)



Rhodes Hills, Dorie (near Ashburton)

Method

- Both the trials were installed in the commercial field crop in the early summer when the onions were at mid – bulbing stage. Under normal conditions these crops would be left to finish without any additional fertiliser application.
- Trial sites were selected for ease of access and positioned within the commercial crops to avoid any interference from irrigation or sprayer lanes. Trial sites were visibly representative of the prevalent soil type and growing conditions of each crop.
- Each trial was comprised of 3 plots of 10 x 10 m square to encompass 5 beds at 2m centres, plus the adjacent Farm Standard crop as the Control. This gave a total of 4 treatments with 5 replicates within each treatment.
- Fertiliser treatments were applied by manually broadcasting measured amounts of NOP based compound fertiliser Rustica Hi-K N - P - K - S 12 - 3 - 20 - 6 to give the equivalent kg/ha applied nutrient total of: N - P - K - S
 - 150 kg/ha-----18 – 4.5 - 30 - 9
 - 300 kg/ha-----36 - 9 - 60 - 18
 - 450 kg/ha-----54 – 13.5 - 90 - 27
 - Control = Normal Farm Management. (nil additional fertiliser applied)
- In all other respects the trial was subject to the same crop management as the rest of the field.





Method continued...

- After undercutting and field curing, all of the trial plots were measured by weighing a representative hand harvested sub-plot consisting of 2 metres of bed collected from the mid-point of each bed in each treatment.
- These sub-plot samples remained in-situ in 25kg onion nets in the field until the field crop was bulk harvested. This ensured that all trial samples were subjected to identical environmental conditions, at which point they were then removed to storage for size grading and weighing.

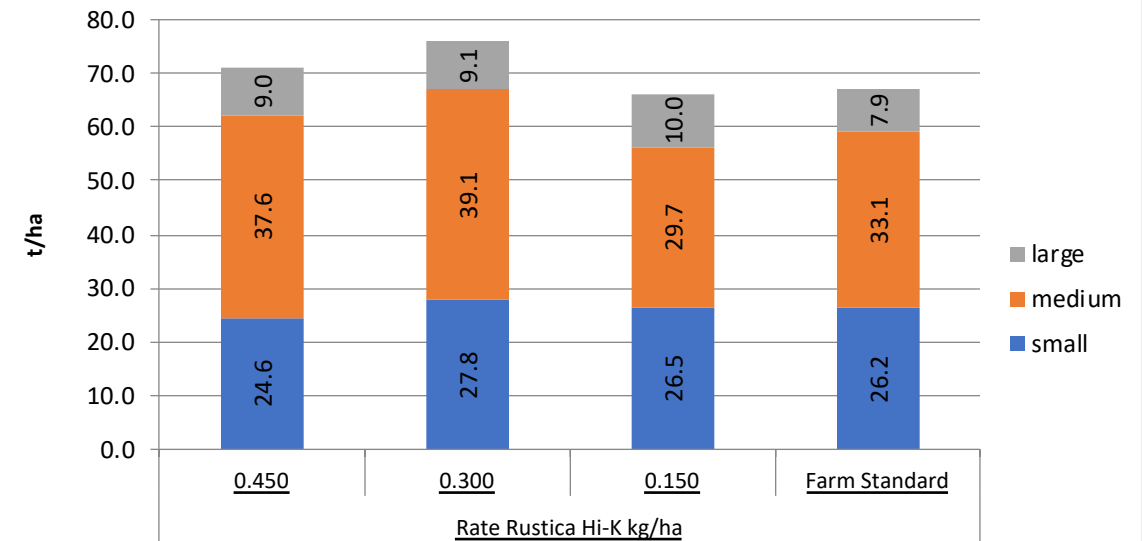
Results for Belmont Farm

- Results clearly demonstrate that there is a significant yield response from applying Rustica Hi-K at 300 kg/ha in a high yielding crop which is already approaching 70 tonnes per hectare. Furthermore, a large proportion of this additional yield increase is in the medium size grade, which is the higher value grade for dry bulb onions.
- The economic response in this trial at current prices is over 18 times the cost of the additional fertiliser applied at the 300 kg/ha rate.

Treatment Application Rate		0.450 kg/ha Rustica Hi-K			0.300 kg/ha Rustica Hi-K		
	Size Grade	small	med	large	small	med	large
Sample Designation	a	4.78	5.14	2.58	5.76	6.84	1.80
	b	4.52	9.42	0.54	6.58	9.06	1.42
	c	5.06	7.68	2.02	5.32	6.82	1.64
	d	6.34	8.82	0.88	3.78	7.02	2.62
	e	3.92	6.54	2.98	6.32	9.36	1.62
Average Yield of each Size Grade t/ha		24.6	37.6	9.0	27.8	39.1	9.1
Proportion of each Size Grade %		34.57	52.79	12.64	36.55	51.47	11.98
Difference in Size Grades over Control t/ha		-1.56	4.54	1.08	1.58	6.04	1.18
Total Yield for each Treatment t/ha		71.2			75.96		
Total Difference over Control t/ha		4.06			8.80		

Treatment Application Rate		0.150 kg/ha Rustica Hi-K			CONTROL		
	Size Grade	small	med	large	small	med	large
Sample Designation	a	6.24	5.62	1.50	4.9	8.54	1.36
	b	5.74	4.72	1.40	6.34	4.72	0.30
	c	4.96	6.12	2.12	5.8	4.46	1.80
	d	4.58	5.62	3.62	5.06	6.46	2.12
	e	5.02	7.62	1.38	4.08	8.88	2.34
Average Yield of each Size Grade t/ha		26.5	29.7	10.0	26.2	33.1	7.9
Proportion of each Size Grade %		40.05	44.82	15.12	38.98	49.23	11.79
Difference in Size Grades over Control t/ha		0.36	-3.36	2.10			
Total Yield for each Treatment t/ha		66.26			tonnes 67.16		
Total Difference over Control t/ha		-0.90			CONTROL		

Belmont Onion Trial Total Yield (t/ha) x Treatment & Size Grade May 2019



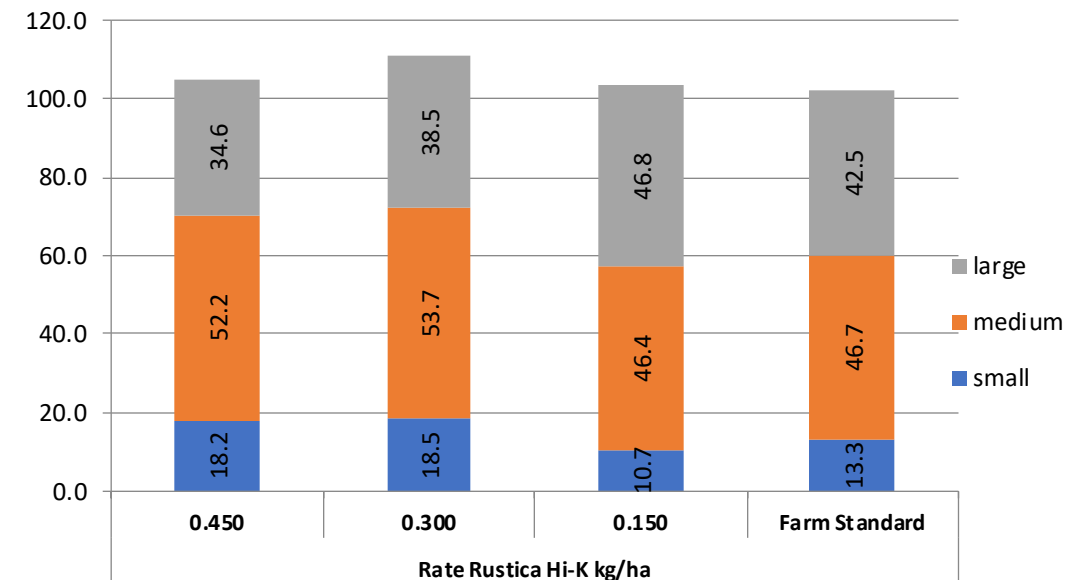
Results for Rhodes Hills

- This same trend as Belmont is also found in the Rhodes Hills trial at an even higher yield level of over 100 tonnes/ha, as shown below.
- The economic response in this trial at current prices is over 17 times the cost of the additional fertiliser applied at the 300 kg/ha rate.

Treatment Application Rate	0.450	kg/ha Rustica Hi-K			0.300	kg/ha Rustica Hi-K	
Size Grade	small	med	large	small	med	large	
Sample Designation	a	3.48	9.42	6.82	4.86	11.08	9.04
	b	4.22	10.16	7.94	4.52	11.32	7.40
	c	2.30	9.10	5.80	3.02	10.18	6.52
	d	3.64	12.42	6.98	2.90	11.35	6.82
	e	4.58	11.08	7.02	3.18	9.74	8.74
Average Yield of each Size Grade t/ha		18.22	52.18	34.56	18.48	53.67	38.52
Proportion of each Size Grade %		17.36	49.71	32.93	16.70	48.50	34.81
Difference in Size Grades over Control t/ha		4.97	5.48	-7.96	5.23	6.97	-4.00
Total Yield for each Treatment t/ha				104.96			110.67
Total Difference over Control t/ha				2.49			8.20

Treatment Application Rate	0.150	kg/ha Rustica Hi-K			CONTROL		
Size Grade	small	med	large	small	med	large	
Sample Designation	a	2.18	8.06	6.78	3.18	8.94	8.86
	b	1.78	9.16	10.56	1.78	7.84	8.52
	c	1.90	8.38	9.28	2.21	8.84	9.72
	d	1.84	10.24	9.02	2.82	9.02	9.90
	e	2.96	10.52	11.16	3.26	12.06	5.52
Average Yield of each Size Grade t/ha		10.66	46.36	46.80	13.25	46.70	42.52
Proportion of each Size Grade %		10.27	44.65	45.08	12.93	45.57	41.50
Difference in Size Grades over Control t/ha		-2.59	-0.34	4.28			
Total Yield for each Treatment t/ha				103.82		tonnes	102.47
Total Difference over Control t/ha				1.35			

Rhodes Hills Onion Trial Total Yield (t/ha) x Treatment & Size Grade May 2019



Discussion

The results from both of these field trials are highly significant. The information gained in both of these trials confirms that it is now agronomically and economically feasible for growers to increase the yield and quality of the onion crop by application of the right product, at the right rate and at the right time. This presents onion growers with the opportunity to make well informed decisions for improved onion production.

Whereas it has long been presumed within the local onion industry that additional fertiliser applications will compromise both size (excessively large) and quality (reduced storability), we have clearly shown that this is no longer a safe assumption. Therefore, the graded samples are now in long term storage and will be assessed monthly for keeping quality over the next five months.

From preliminary observations in crops of process potatoes and carrots this season, I expect that we can show that it is possible to achieve similar results with Rustica Hi-K in these crops also.