

Ag-Quest Inc.

Trial ID: PR151-MWA
Location: ELM CREEK, MB

Protocol ID:
Study Director: Trent Knight
Investigator: David R. S. Rourke

General Trial Information

Study Director: Trent Knight
Affiliation: PowerRich Corporation
Postal Code: R2X 2V9 **E-mail:** powerrich@mts.net
Investigator: Mike Wall **Title:** Research Associate
Affiliation: Ag-Quest, Inc.
Postal Code: R0K 1M0 **E-mail:** Mike.Wall@Agquest.com

Trial Location

City: Elm Creek **Trial Status:** ONE-
YEAR/FINAL
State/Prov.: MB
Postal Code: R0G0N0 **Initiation Date:** 14 Jun 2011
Country: CAN
Directions:
1 mile south and 1.25 miles west of junction of hwy's #2 and #13.

Cooperator/Landowner

Cooperator: Ag-Quest, Inc. (Elm Creek) **Country:** CAN
Phone No: 204-436-3080
Address 1: P.O. Box 193 **Fax No:** 204-436-3082
City: Elm Creek
State/Prov: MB
Postal Code: R0G0N0 **E-mail:** Mike.Wall@Agquest.com

Crop Description

Crop 1: SOLTU Solanum tuberosum Potato
Variety: Ivory Crisp
BBCH Scale: BPOT **Planting Date:** 14 Jun 2011
Planting Method: SEEDED **Rate, Unit:** 1350 KG/HA
Depth, Unit: 10 CM
Row Spacing, Unit: 96 CM **Spacing Within Row, Unit:** 40 CM
Seed Bed: MEDIUM
Soil Moisture: SLIGHTLY WET
Harvest Date: 06 Oct 2011 **Harvest Equipment:** HAND HARVESTED
Weighing Equipment: ELECTRONIC BALANCE

Site and Design

Plot Width, Unit: 2 M **Site Type:** FIELD
Plot Length, Unit: 7.5 M **Tillage Type:** CONVENTIONAL-TILL
Replications: 4 **Study Design:** Randomized Complete Block
Soil Drainage: G Good

Trial Initiation Comments:

Granular fertilizer was broadcast and incorporated using deep cultivation prior to planting.

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	Previous Crops	Previous Pesticides	Year
1.	Wheat	Puma	2010
2.	Fallow	Glyphosate	2009
3.	Millet	Pardner	2008

Maintenance

No.	Date	Maintenance Treatment Name	Form Conc	Form Unit	Form Type	Rate	Rate Unit	Tank Mix
1.	30 Jun 2011	Sencor	75	%AW/W	WG	375	G/HA	N
2.	14 Jul 2011	Select	240	GA/L	EC	370	ML/HA	N
3.	21 Jul 2011	Admire 240	240	GA/L	F	200	ML/HA	N
4.	04 Aug 2011	Admire 240	240	GA/L	F	250	ML/HA	N

Soil Description

Description Name: Range 1 (SE 23-8-5W) 0-10cm

% Sand: 76 % OM: 2.1 **Texture:** SANDY LOAM
 % Silt: 13 **pH:** 7.8 **Soil Name:** Almassippi
 % Clay: 11 **CEC:** 10 **Fert. Level:** FAIR

Analyzed By:

ALS Labs

Additional Measured Elements

Element	Quantity	Unit
N	150	KG/HA
P	60	KG/HA
K	140	KG/HA
S	10	KG/HA

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Application Description

	A	B	C	D
Application Date:	01 Aug 2011	09 Aug 2011	15 Aug 2011	22 Aug 2011
Time of Day:	10:45	12:45	9:45	8:30
Application Method:	SPRAY	SPRAY	SPRAY	SPRAY
Application Timing:	POSPOS	POSPOS	POSPOS	POSPOS
Application Placement:	FOLIAR	FOLIAR	FOLIAR	FOLIAR
Applied By:	MW	MW	MW	MW
Air Temperature, Unit:	28 C	22.8 C	24 C	22 C
% Relative Humidity:	67	60		69
Wind Velocity, Unit:	8 KPH	7 KPH	3 KPH	3 KPH
Wind Direction:	S	NNW	ESE	SW
Dew Presence (Y/N):	N	N	N	Y
Water Hardness:	121 mg/L	121 mg/L	121 mg/L	121 mg/L
Soil Temperature, Unit:	22 C	21.5 C	21.9 C	18.7 C
Soil Moisture:	INADEQUATE	INADEQUATE	INADEQUATE	INADEQUATE
% Cloud Cover:	80	50	5	0
Next Rain Occurred On:	04 Aug 2011	28 Aug 2011	28 Aug 2011	28 Aug 2011

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Application Date:	02 Sep 2011
Time of Day:	11:00
Application Method:	SPRAY
Application Timing:	POSPOS
Application Placement:	FOLIAR
Applied By:	MW
Air Temperature, Unit:	21.2 C
% Relative Humidity:	57
Wind Velocity, Unit:	2 KPH
Wind Direction:	SSE
Dew Presence (Y/N):	Y
Water Hardness:	121 mg/L
Soil Temperature, Unit:	18.8 c
Soil Moisture:	INADEQUATE
% Cloud Cover:	5
Next Rain Occurred On:	03 Sep 2011

Crop Stage At Each Application

	A	B	C	D	E
Crop 1 Code, BBCH Scale:	SOLTU BPOT	SOLTU BPOT	SOLTU BPOT	SOLTU BPOT	SOLTU BPOT

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Application Equipment

	A	B	C
Appl. Equipment:	2M BACKPACK	2M BACKPACK	2M BACKPACK
Operating Pressure, Unit:	276 KPA	276 KPA	276 KPA
Nozzle Type:	FLAT FAN	FLAT FAN	FLAT FAN
Nozzle Size:	AI 110015	AI 110015	AI 110015
Nozzle Spacing, Unit:	50 CM	50 CM	50 CM
Nozzle Calibration, Unit:	585 ML/MIN	585 ML/MIN	585 ML/MIN
Boom Length, Unit:	2 M	2 M	2 M
Boom Height, Unit:	45 CM	45 CM	45 CM
Ground Speed, Unit:	7 KPH	7 KPH	7 KPH
Carrier:	WATER	WATER	WATER
Spray Volume, Unit:	100 L/HA	100 L/HA	100 L/HA
Mix Size, Unit:	1 Liters	1 Liters	1 Liters
Propellant:	CO2	CO2	CO2
Tank Mix (Y/N):	N	N	N
	D	E	
Appl. Equipment:	2M BACKPACK	2M BACKPACK	
Operating Pressure, Unit:	276 KPA	276 KPA	
Nozzle Type:	FLAT FAN	FLAT FAN	
Nozzle Size:	AI 110015	AI 110015	
Nozzle Spacing, Unit:	50 CM	50 CM	
Nozzle Calibration, Unit:	585 ML/MIN	585 ML/MIN	
Boom Length, Unit:	2 M	2 M	
Boom Height, Unit:	45 CM	45 CM	
Ground Speed, Unit:	7 KPH	7 KPH	
Carrier:	WATER	WATER	
Spray Volume, Unit:	100 L/HA	100 L/HA	
Mix Size, Unit:	1 Liters	1 Liters	
Propellant:	CO2	CO2	
Tank Mix (Y/N):	N	N	

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Crop Code	SOLTU		SOLTU		SOLTU		SOLTU		SOLTU	
BBCH Scale	BPOT		BPOT		BPOT		BPOT		BPOT	
Crop Name	Potato		Potato		Potato		Potato		Potato	
Part Rated	PLANT C		PLANT C		PLANT C		PLANT C		PLANT C	
Rating Date	09 Aug 2011		09 Aug 2011		15 Aug 2011		15 Aug 2011		22 Aug 2011	
Rating Data Type	PHYGEN		VIGOR		PHYGEN		VIGOR		PHYGEN	
Rating Unit	%		0-9		%		0-9		%	
Assessed By	MW		MW		MW		MW		MW	
Days After First/Last Applic.	8 0		8 0		14 0		14 0		21 0	
Trt-Eval Interval	8 DA-A		8 DA-A		14 DA-A		14 DA-A		21 DA-A	
Plant-Eval Interval	56 DP-1		56 DP-1		62 DP-1		62 DP-1		69 DP-1	
ARM Action Codes										
Number of Decimals										
Trt Treatment	Rate	Unit	Plot	1	2	3	4	5	6	
1	Headline EC	667 ml/ha	101	0.0	8.0	0.0	8.0	0.0	8.0	
	Bravo 500	1309 ml/ha	202	0.0	8.0	0.0	8.0	0.0	8.0	
	Quadris	790 ml/ha	301	0.0	8.0	0.0	8.0	0.0	8.0	
	Dithane DG Rainshield NT	2.22 kg/ha	402	0.0	8.0	0.0	8.0	0.0	8.0	
	Bravo 500	1309 ml/ha								
				Mean =	0.0	8.0	0.0	8.0	0.0	8.0
2	Headline EC	667 ml/ha	102	0.0	8.0	0.0	8.0	0.0	8.0	
	Foliar Phosphate	12.35 l/ha	201	0.0	8.0	0.0	8.0	0.0	8.0	
	Bravo 500	1309 ml/ha	302	0.0	8.0	0.0	8.0	0.0	8.0	
	Foliar Phosphate	12.35 l/ha	401	0.0	8.0	0.0	8.0	0.0	8.0	
	Quadris	790 ml/ha								
	Foliar Phosphate	12.35 l/ha								
	Dithane DG Rainshield NT	2.22 kg/ha								
	Foliar Phosphate	12.35 l/ha								
	Bravo 500	1309 ml/ha								
	Foliar Phosphate	12.35 l/ha								
				Mean =	0.0	8.0	0.0	8.0	0.0	8.0

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Crop Code	SOLTU	SOLTU	SOLTU	SOLTU	SOLTU	SOLTU	
BBCH Scale	BPOT	BPOT	BPOT	BPOT	BPOT	BPOT	
Crop Name	Potato	Potato	Potato	Potato	Potato	Potato	
Part Rated	PLANT C	PLANT C	PLANT C	TUBER C	TUBER C	TUBER C	
Rating Date	02 Sep 2011	02 Sep 2011	21 Sep 2011	06 Oct 2011	06 Oct 2011	06 Oct 2011	
Rating Data Type	PHYGEN	VIGOR	HEIGHT	YIELD	YIELD	YIELD	
Rating Unit	%	0-9	CM	kg/ha	ton/ac	cwt/ac	
Assessed By	MW	MW	MW	MW	MW	MW	
Days After First/Last Applic.	32 0	32 0	51 19	66 34	66 34	66 34	
Trt-Eval Interval	32 DA-A	32 DA-A	99 DP-1	114 DP-1	114 DP-1	114 DP-1	
Plant-Eval Interval	80 DP-1	80 DP-1					
ARM Action Codes					T1	T2	
Number of Decimals				0	0	0	
Trt Treatment	Rate						
No. Name	Rate Unit Plot	7	8	9	10	11	12
1 Headline EC	667 ml/ha 101	0.0	8.0	43.40	24521	11	219
Bravo 500	1309 ml/ha 202	0.0	8.0	41.60	42693	19	381
Quadris	790 ml/ha 301	0.0	8.0	35.00	25999	12	232
Dithane DG Rainshield NT	2.22 kg/ha 402	0.0	8.0	39.00	35468	16	316
Bravo 500	1309 ml/ha						
	Mean =	0.0	8.0	39.75	32170	14	287
2 Headline EC	667 ml/ha 102	0.0	8.0	45.40	36782	16	328
Foliar Phosphate	12.35 l/ha 201	0.0	8.0	42.60	44882	20	400
Bravo 500	1309 ml/ha 302	0.0	8.0	42.60	42419	19	378
Foliar Phosphate	12.35 l/ha 401	0.0	8.0	42.80	40941	18	365
Quadris	790 ml/ha						
Foliar Phosphate	12.35 l/ha						
Dithane DG Rainshield NT	2.22 kg/ha						
Foliar Phosphate	12.35 l/ha						
Bravo 500	1309 ml/ha						
Foliar Phosphate	12.35 l/ha						
	Mean =	0.0	8.0	43.35	41256	18	368

ARM Action Codes

$$T1 = ([10]*2.20462*.4047)/2000$$

$$T2 = [10]*2.2046*.4047/100$$

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BBCH Scale	BPOT		BPOT		BPOT		BPOT		
Crop Name	Potato		Potato		Potato		Potato		
Part Rated	PLANT C		PLANT C		PLANT C		PLANT C		
Rating Date	09 Aug 2011	09 Aug 2011	15 Aug 2011	15 Aug 2011	22 Aug 2011	22 Aug 2011			
Rating Data Type	PHYGEN		VIGOR		PHYGEN		VIGOR		
Rating Unit	%		%		%		%		
Assessed By	MW		MW		MW		MW		
Days After First/Last Applic.	8 0	8 0	14 0	14 0	21 0	21 0			
Trt-Eval Interval	8 DA-A		8 DA-A		14 DA-A		14 DA-A		
Plant-Eval Interval	56 DP-1		56 DP-1		62 DP-1		62 DP-1		
ARM Action Codes									
Number of Decimals									
Trt No.	Treatment Name	Rate	Unit	1	2	3	4	5	6
1	Headline EC	667	ml/ha	0.0 a	8.0 a	0.0 a	8.0 a	0.0 a	8.0 a
	Bravo 500	1309	ml/ha						
	Quadris	790	ml/ha						
	Dithane DG Rainshield NT	2.22	kg/ha						
	Bravo 500	1309	ml/ha						
2	Headline EC	667	ml/ha	0.0 a	8.0 a	0.0 a	8.0 a	0.0 a	8.0 a
	Foliar Phosphate	12.35	l/ha						
	Bravo 500	1309	ml/ha						
	Foliar Phosphate	12.35	l/ha						
	Quadris	790	ml/ha						
	Foliar Phosphate	12.35	l/ha						
	Dithane DG Rainshield NT	2.22	kg/ha						
	Foliar Phosphate	12.35	l/ha						
	Bravo 500	1309	ml/ha						
	Foliar Phosphate	12.35	l/ha						
LSD (P=.05)				0.00	0.00	0.00	0.00	0.00	0.00
Standard Deviation				0.00	0.00	0.00	0.00	0.00	0.00
CV				0.0	0.0	0.0	0.0	0.0	0.0
Bartlett's X2				0.0	0.0	0.0	0.0	0.0	0.0
P(Bartlett's X2)			
Replicate F				0.000	0.000	0.000	0.000	0.000	0.000
Replicate Prob(F)				1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Treatment F				0.000	0.000	0.000	0.000	0.000	0.000
Treatment Prob(F)				1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Means followed by same letter do not significantly differ (P=.05, Duncan's New MRT)

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Crop Name	Potato	Potato	Potato	Potato	Potato	Potato		
Part Rated	PLANT C	PLANT C	PLANT C	TUBER C	TUBER C	TUBER C		
Rating Date	02 Sep 2011	02 Sep 2011	21 Sep 2011	06 Oct 2011	06 Oct 2011	06 Oct 2011		
Rating Data Type	PHYGEN	VIGOR	HEIGHT	YIELD	YIELD	YIELD		
Rating Unit	%	0-9	CM	kg/ha	ton/ac	cwt/ac		
Assessed By	MW	MW	MW	MW	MW	MW		
Days After First/Last Applic.	32 0	32 0	51 19	66 34	66 34	66 34		
Trt-Eval Interval	32 DA-A	32 DA-A						
Plant-Eval Interval	80 DP-1	80 DP-1	99 DP-1	114 DP-1	114 DP-1	114 DP-1		
ARM Action Codes					T1	T2		
Number of Decimals				0	0	0		
Trt Treatment	Rate							
No. Name	Rate Unit	7	8	9	10	11	12	
1	Headline EC	667 ml/ha	0.0 a	8.0 a	39.75 a	32170 a	14 a	287 a
	Bravo 500	1309 ml/ha						
	Quadris	790 ml/ha						
	Dithane DG Rainshield NT	2.22 kg/ha						
	Bravo 500	1309 ml/ha						
2	Headline EC	667 ml/ha	0.0 a	8.0 a	43.35 a	41256 a	18 a	368 a
	Foliar Phosphate	12.35 l/ha						
	Bravo 500	1309 ml/ha						
	Foliar Phosphate	12.35 l/ha						
	Quadris	790 ml/ha						
	Foliar Phosphate	12.35 l/ha						
	Dithane DG Rainshield NT	2.22 kg/ha						
	Foliar Phosphate	12.35 l/ha						
	Bravo 500	1309 ml/ha						
	Foliar Phosphate	12.35 l/ha						
LSD (P=.05)		0.00	0.00	4.625	10248.6	4.6	91.4	
Standard Deviation		0.00	0.00	2.056	4554.9	2.0	40.6	
CV		0.0	0.0	4.95	12.41	12.41	12.41	
Bartlett's X2		0.0	0.0	2.314	2.075	2.075	2.075	
P(Bartlett's X2)		.	.	0.128	0.15	0.15	0.15	
Replicate F		0.000	0.000	2.589	3.062	3.062	3.062	
Replicate Prob(F)		1.0000	1.0000	0.2277	0.1913	0.1913	0.1913	
Treatment F		0.000	0.000	6.134	7.958	7.958	7.958	
Treatment Prob(F)		1.0000	1.0000	0.0895	0.0667	0.0667	0.0667	

Means followed by same letter do not significantly differ (P=.05, Duncan's New MRT)

ARM Action Codes

T1 = $([10]*2.20462*.4047)/2000$

T2 = $[10]*2.2046*.4047/100$

Trial Comments

MATERIAL AND METHODS:

Certified Ivory Crisp potato was planted on 14 Jun 2011. Spray applications of fungicide and test fertilizer were made on Aug 01, Aug 09, Aug 15, Aug 22, and Sep 02 at 276kPa and at a volume of 100 L/ha. A 2-12-13 liquid PowerRich formulation was used. Crop injury and visual vigour ratings were taken at 8, 14, 21, and 32 DAA (Days After Application A). Plant heights were measured on Sep 21. The trial was harvested on Oct 06.

WEATHER SUMMARY DATA

Month	Degree difference from normal temp		% normal precipitation
	Max.	Min.	
May	-4.1	+0.3	196.6%
June	-1.3	+1.6	99.8%

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July		+1.4		+2.2		23.5%
August		+1.8		+1.4		21.3%
September		+2.7		+1.0		123.2%

RESULTS:

1. Crop Injury and Vigour:

No symptoms of crop injury were visible for either treatment and both treatments showed equal vigour.

2. Plant Heights:

Treatment 2 (fungicide+PowerRich Foliar Phosphate treatment) produced a slight increase in crop height over treatment 1 but the increase was not statistically significant at the 5% level of significance.

2. Yields:

Treatment 2 (fungicide+Foliar Phosphate treatment) yielded more than treatment 1 (fungicide alone), though yields were not statistically significant at the 5% level. At the 10% level of significance, the increase in yield was significant. The yield average for treatment 2 was 41256 kg/ha and for treatment 1 was 32170 kg/ha.

CONCLUSION:

The addition of Foliar Phosphate to fungicide applications increased yields by slightly more than 9000 kg/ha (4 ton/ac or 80 cwt/ac) over the fungicides alone. Crop safety was excellent. The increase in yields was not significant at the 5% level but was becomes statistically significant at the 10% level of significance.