

Qualls Agricultural Laboratory

Bluefield Seeding Potato Seed Starter Fertilizer Reduction Trial

Trial ID: Bluefield_QAL_24-01_Potato
 Protocol ID: Bluefield_QAL_24-01 Location: Ephrata, WA Trial Year: 2024
 Study Director: Craig McCloskey Sponsor Contact:
 Investigator: Mark Qualls

Reps: 4 Plots: 11.3 by 50 feet
 Mix Size: 4 L

Trt No.	Treatment Name	Form Conc	Form Type	Form Rate	Form Unit	Rate Appl Amount	Form Amount	Mix Size	Mix Unit	Comment	Amt Product to Measure	Rep			
												1	2	3	4
1	GSP	100 %	L	10 gal/a		10 GAL/AC	4.0 L	Continuous band of fert on each side of tuber	3999.6 mL/mx	101	203	301	402		
2	50% GSP	100 %	L	10 gal/a		10 GAL/AC	4.0 L	6" band on each side of tuber	3999.6 mL/mx	102	204	303	401		
3	50% of 1.5X GSP	100 %	L	15 gal/a		15 GAL/AC	4.0 L	6" band on each side of tuber	3999.6 mL/mx	103	202	304	403		
4	33% of 1.5X GSP	100 %	L	15 gal/a		15 GAL/AC	4.0 L	4" band on each side of tuber	3999.6 mL/mx	104	201	302	404		

Sort Order: Replicate 1

Product quantities required for listed treatments and applications of trials included in this table:

Amount*	Unit	Treatment Name	Form Conc	Form Unit	Form Type	Lot Code
4,999.457	mL	GSP	100	%	L	
4,999.457	mL	50% GSP	100	%	L	
4,999.457	mL	50% of 1.5X GSP	100	%	L	
4,999.457	mL	33% of 1.5X GSP	100	%	L	

* 'Per area' calculations based on application amount= 10,15 GAL/AC, mix size= 4 L (mix size basis).
 * Product amount calculations increased 25 % for overage adjustment.

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 Study Director: Craig McCloskey Sponsor Contact:
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General Trial Information

Study Director: Craig McCloskey **Title:** Study Director
Investigator: Mark Qualls **Title:** Director of Research

Status: E established
ARM Trial Created On: Apr-24-2024 **Reliability:** GOOD good quality
Initiation Date: Apr-29-2024 **Planned Completion Date:** Sep-12-2024
Completion Date: Sep-12-2024

Trial Location

City: Ephrata **Country:** USA United States
State/Prov.: Washington
Postal Code: 98823

Regulations

Conducted Under GLP: No
Conducted Under GEP: No

Objectives:

Objectives:

- Compare in-furrow starter fertilizer placement on potatoes that are planted on 12" seed spacing down the rows.
 - Using the same rate and type of starter fertilizer on all treatments but varying the band length of the application in furrow to see if there are any differences in yield.

Treatment #1- A check of the standard of **10 gal/ac of McGregor Blend** (standard for our area)

Treatment #2- Bluefield method-50% of the **10 gal/ac** rate, applied 1/2 of the linear distance (Ex. @ 12" would be 6" of product center relative to the sets location{3" before and after seed's placement linearly})

Treatment #3- Bluefield method-50% of a **15 gal/ac of McGregor Blend** rate, applied 1/2 of the linear distance, same as above.

Treatment #4- Bluefield method-33% of a **15 gal/ac** rate, applied 1/3 of the linear distance, (Ex. @ 12" would be 4" of product center relative to the sets location{2" before and after seed's placement linearly})

-
-

Yield data reported as processor grade: US #1's, #2's, undersize/culls from center 2 rows of a 4 row plot by 50' length. Included in cost.

Each plot is 4 rows by 50', row spacing 34"

Normal in-season fertigation applications made using center pivot sprinkler. Target total nitrogen 375-400 units of N/acre per season.

Potatoes planted by hand to achieve exact seed spacing.

Fertilizer application made by hand spraying next to the seed piece prior to covering rows.

Ratings for emergence at 2 time points, and row closure at 3 timepoints.

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Contacts

Role: STYDIR study director
Study Director: Craig McCloskey **Title:** Study Director
Organization: Bluefield Seeding
Address 1: 759 Darlingtron Rd
Country: CAN Canada
City: Brookfield **State/Prov:** PE **Postal Code:** C0A 1Y0
Role: INVEST investigator
Investigator: Mark Qualls **Title:** Director of Research
Organization: Qualls Agricultural Laboratory
Address 1: 3975 Dodson Rd N **Phone No.:** 5097874210
Country: USA United States
City: Ephrata **Postal Code:** 98823
Role: COOPER cooperater
Cooperator: QAL **Title:** FALDOW
Organization: Qualls Agricultural Laboratory
Address 1: 3975 Dodson Rd N **Phone No.:** 5097874210
Country: USA United States **E-mail:** mqualls@qa-lab.com
City: Ephrata **State/Prov:** WA **Postal Code:** 98823

Crop Description

Crop 1: C SOLTU Solanum tuberosum Potato
Entry Date: May-23-2024 **Stage Scale:** BBCH
Variety: Clearwater
Planting Date: Apr-29-2024 **Planting Rate:** 2700 LB/A
Depth: 8 IN
Rows per Plot: 4 **Planting Method:** HILLED hilled
Row Spacing: 34 IN **Planting Equipment:** HA by hand
Spacing within Row: 12 IN **Seed Bed:** FINTRA fine/trashy
Soil Temperature: 56 F **Soil Moisture:** NORMAL normal, adequate
Emergence Date: May-24-2024
Harvest Date: Sep-10-2024 **Harvest Equipment:** Lockwood Research Harvester
Harvested Width: 5.67 FT
Harvested Length: 50 FT
Weighing Equipment: Rice Lake System

Site and Design

Treated Plot Width: 11.33 FT
Treated Plot Length: 50 FT
Treated Plot Area: 566.5 FT²
Replications: 4 **Treatments:** 4 **Plots:** 16 **Study Design:** RACOB� Randomized Complete Block (RCB)
Distance between Blocks: 1 FT
Distance between 'Plot' Experimental Units: 0.5 FT

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Maintenance

No.	Date	Type	Maintenance Product Name	Form Conc	Form Unit	Form Type	Rate	Rate Unit	Comment
1.	Mar-26-2024	CULT							Plowed Field 14" deep
2.	Mar-28-2024	CULT							Disked Field
3.	Apr-12-2024	FERT							125N-220P-200K-40S-1B-3Mn dry fertilizer spread on field
4.	May-8-2024	CULT							Potato Hill up for weed control
5.	May-9-2024	HERB	BOUNDARY 6.5 EC	777.5	gA/L	EC	1.5	PT/A	Weed control
6.	Sep-28-2024	HERB	REGLONE	400	gA/L	SL	2	PT/A	Vine Burndown
7.	Sep-2-2024	HERB	REGLONE	400.0	gA/L	SL	2	PT/A	Vine Burndown

Field Prep./Maintenance:

Total Fertilizer for Season= 409 lbs of N

Pre-Plant Fertilizer

125N-220P-200K-40S-1B-3Mn dry fertilizer spread on field

+ 284.3 lbs of N in season fertication.

Total Irrigation = 39.56"

Provided by center pivot sprinkler system using Nelson rotator sprinkler heads.

Soil Description

Description Name: Timmerman Sandy Loam
 % Sand: 77 % OM: 1.4 Texture: SL sandy loam
 % Silt: 18 Soil Name: Timmerman
 % Clay: 5 Fert. Level: G good
 pH: 7.2 CEC: 11.3

Soil Drainage: E excellent

Weather Conditions

Overall Moisture Conditions: NORMAL normal
Weather Station Name: Qualls Agricultural Laboratory **Distance:** 0.75 MI

Comment:

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Application Description

	A
Date	Apr-29-2024
Start Time	1:00 PM
Stop Time	1:30 PM
Method	SPRAY
Timing	0
Placement	INFURR
Mixed/Prepared By	QAL
Applied By	Tom Redmon/Errolynne Stephen
Entry Date	Apr-29-2024
Air Temperature Start, Stop	58, 58 F
% Relative Humidity Start, Stop	30, 30
Wind Velocity+Dir. Start	5 MPH, W
Wind Velocity+Dir. Stop	4 MPH, W
Wind Velocity+Dir. Max	6 MPH, W
Wet Leaves (Y/N)	N, no
Soil Temperature	52 F
Soil Temperature Depth	4 IN
Soil Moisture	GOOD
Soil Surface Condition	FINTRA
% Ground Cover	0
% Cloud Cover	80

Crop Stage At Each Application

	A
Crop 1 Code, BBCH Scale	SOLTU, BPOT
Days after Emergence	-25
Stage Majority, Percent	00, 100

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Application Equipment

	A
Equipment Name	In-Furrow
Equipment Type	SPPLMO
Operation Pressure	35 PSI
Nozzle Model	8001
Nozzle Type	Even Flat
Nozzle TradeName	TeeJet
Nozzle Tip Size, Color	8001, Orange
Nozzle Spacing	5.0 IN
Nozzles/Row	2.0
Band Width	0.5 IN
Boom Length	34.0 IN
Boom Height	6.0 IN
Ground Speed	0 MPH
Carrier	WATER
Application Amount	10 GAL/AC
Mix Size	4 liters
Propellant	COMN2
Tank Mix (Y/N)	N, no

Notes

No.	Context	Date	By	Notes
1.	STATUS	Apr-24-2024	Mark Qualls	Automatically added by ARM: Trial Status updated to 'S' during trial creation by (XQAQUA).
2.	STATUS	Apr-29-2024	Mark Qualls	Automatically added by ARM: Trial Status updated to 'E' when Date was entered by (XQAQUA).

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SE Description	Plant Stand	% General phyto>	Plant Stand	% General phyto>	% Row Closure	% Row Closure	% Row Closure	TUGR1, C	TUGR2, C	
Part Rated	PLANT, -	PLANT, -	PLANT, -	PLANT, -	CANOPY, C	CANOPY, C	CANOPY, C	TUGR1, C	TUGR2, C	
Rating Type	COUNT	PHYGEN	COUNT	PHYGEN	CABERO	CABERO	CABERO	YIELD	YIELD	
Rating Unit	NUMBER	%	NUMBER	%	%	%	%	LB	LB	
Sample Size	100 ROWFT	1 PLOT	100 ROWFT	1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT	
Collection Basis	1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT	283.5 FT2	283.5 FT2	
Reporting Basis	100 ROWFT	1 PLOT	100 ROWFT	1 PLOT	1 PLOT	1 PLOT	1 PLOT			
Crop Name	Potato	Potato	Potato	Potato	Potato	Potato	Potato	Potato	Potato	
Crop Variety	Clearwater	Clearwater	Clearwater	Clearwater	Clearwater	Clearwater	Clearwater	Clearwater	Clearwater	
Days After First/Last Applic.	29, 29	29, 29	39, 39	39, 39	49, 49	56, 56	77, 77	134, 134	134, 134	
Trt Treatment	Rate									
No. Name	Rate Unit Plot	1	2	3	4	5	6	7	8	9
1 GSP	10 gal/a 101	66.0	0.0	87.0	0.0	50.0	70.0	100.0	306.50	8.600
	203	70.0	0.0	83.0	0.0	50.0	70.0	100.0	280.90	7.950
	301	68.0	0.0	87.0	0.0	50.0	70.0	100.0	314.90	4.250
	402	71.0	0.0	85.0	0.0	50.0	70.0	100.0	339.50	4.140
	Mean =	68.8	0.0	85.5	0.0	50.0	70.0	100.0	310.45	6.235
2 50% GSP	10 gal/a 102	52.0	0.0	85.0	0.0	50.0	70.0	100.0	294.70	2.150
	204	65.0	0.0	90.0	0.0	50.0	70.0	100.0	321.10	6.010
	303	75.0	0.0	100.0	0.0	50.0	70.0	100.0	309.50	4.740
	401	76.0	0.0	86.0	0.0	50.0	70.0	100.0	324.00	8.600
	Mean =	67.0	0.0	90.3	0.0	50.0	70.0	100.0	312.33	5.375
3 50% of 1.5X GSP	15 gal/a 103	65.0	0.0	96.0	0.0	50.0	70.0	100.0	311.00	6.450
	202	71.0	0.0	88.0	0.0	50.0	70.0	100.0	327.80	0.890
	304	70.0	0.0	95.0	0.0	50.0	70.0	100.0	303.90	4.820
	403	74.0	0.0	90.0	0.0	50.0	70.0	100.0	345.90	9.300
	Mean =	70.0	0.0	92.3	0.0	50.0	70.0	100.0	322.15	5.365
4 33% of 1.5X GSP	15 gal/a 104	70.0	0.0	86.0	0.0	50.0	70.0	100.0	310.20	6.870
	201	64.0	0.0	87.0	0.0	50.0	70.0	100.0	293.30	5.510
	302	57.0	0.0	85.0	0.0	50.0	70.0	100.0	313.90	1.490
	404	82.0	0.0	88.0	0.0	50.0	70.0	100.0	367.00	13.550
	Mean =	68.3	0.0	86.5	0.0	50.0	70.0	100.0	321.10	6.855

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Rating Date	Sep-10-2024	Sep-10-2024	Sep-10-2024	Sep-10-2024	Sep-10-2024	Sep-10-2024	Sep-18-2024	Sep-18-2024	Sep-18-2024	Sep-18-2024	
SE Description	TUBUNM, C	TUGR1, C	TUGR2, C	TUBUNM, C	TUBTOT, C	TUBMAR, C	TUBER, C	TUBER, C	TUBER, C	TUBER, C	
Part Rated	YIELD	YIELD	YIELD	YIELD	YIELD	YIELD	4-6 oz	6-8 oz	8-10 oz	10-14 oz	
Rating Type	LB	T-US	T-US	T-US	T-US	T-US	% of #1s	% of #1s	% of #1s	% of #1s	
Rating Unit	1 PLOT	1 A	1 A	1 A	1 A	1 A	1 PLOT	1 PLOT	1 PLOT	1 PLOT	
Sample Size	283.5 FT2	283.5 FT2	283.5 FT2	283.5 FT2	283.5 FT2	283.5 FT2	1 PLOT	1 PLOT	1 PLOT	1 PLOT	
Collection Basis	1 A	1 A	1 A	1 A	1 A	1 A	1 PLOT	1 PLOT	1 PLOT	1 PLOT	
Reporting Basis	Potato	Potato	Potato	Potato	Potato	Potato	Potato	Potato	Potato	Potato	
Crop Name	Clearwater	Clearwater	Clearwater	Clearwater	Clearwater	Clearwater	Clearwater	Clearwater	Clearwater	Clearwater	
Crop Variety	134, 134	134, 134	134, 134	134, 134	134, 134	134, 134	142, 142	142, 142	142, 142	142, 142	
Days After First/Last Applic.											
Trt Treatment	Rate										
No. Name	Rate Unit Plot	10	11	12	13	14	15	16	17	18	19
1 GSP	10 gal/a	101	203	301	402	Mean =	102	204	303	401	Mean =
		53.00	63.40	56.00	57.20	57.40	52.70	62.40	73.80	51.20	60.03
		23.5	21.6	24.2	26.1	23.9	22.6	24.7	23.8	24.9	24.0
		0.7	0.6	0.3	0.3	0.5	0.2	0.5	0.4	0.7	0.4
		4.1	4.9	4.3	4.4	4.4	4.0	4.8	5.7	3.9	4.6
		28.3	27.1	28.8	30.8	28.7	26.9	29.9	29.8	29.5	29.0
		24.2	22.2	24.5	26.4	24.3	22.8	25.1	24.1	25.6	24.4
		38.25	37.78	34.36	39.61	37.50	37.59	34.29	44.17	39.80	38.96
		28.98	27.97	26.27	28.09	27.83	25.41	28.96	27.04	27.02	27.11
		16.51	16.53	19.72	18.04	17.70	20.76	16.97	18.04	16.69	18.11
		12.05	13.16	14.73	11.94	12.97	11.80	16.04	10.35	10.52	12.18
2 50% GSP	10 gal/a	103	202	304	403	Mean =	104	201	302	404	Mean =
		63.90	57.90	72.80	56.60	62.80	73.90	61.30	53.70	69.60	64.63
		23.9	25.2	23.3	26.6	24.7	23.8	22.5	24.1	28.2	24.7
		0.5	0.1	0.4	0.7	0.4	0.5	0.4	0.1	1.0	0.5
		4.9	4.4	5.6	4.3	4.8	5.7	4.7	4.1	5.3	5.0
		29.3	29.7	29.3	31.6	30.0	30.0	27.7	28.4	34.6	30.2
		24.4	25.3	23.7	27.3	25.2	24.4	23.0	24.2	29.2	25.2
		36.40	37.80	43.38	35.04	38.15	39.40	37.70	34.32	39.75	37.79
		27.99	30.16	34.76	28.57	30.37	27.70	29.71	28.69	25.48	27.89
		18.29	14.17	14.36	17.55	16.09	15.14	19.50	16.85	15.21	16.68
		12.12	15.03	7.08	13.77	12.00	14.05	11.42	17.58	15.19	14.56
3 50% of 1.5X GSP	15 gal/a	104	201	302	404	Mean =	104	201	302	404	Mean =
		73.90	61.30	53.70	69.60	64.63	73.90	61.30	53.70	69.60	64.63
		23.8	22.5	24.1	28.2	24.7	23.8	22.5	24.1	28.2	24.7
		0.5	0.4	0.1	1.0	0.5	0.5	0.4	0.1	1.0	0.5
		5.7	4.7	4.1	5.3	5.0	5.7	4.7	4.1	5.3	5.0
		30.0	27.7	28.4	34.6	30.2	30.0	27.7	28.4	34.6	30.2
		24.4	23.0	24.2	29.2	25.2	24.4	23.0	24.2	29.2	25.2
		39.40	37.70	34.32	39.75	37.79	39.40	37.70	34.32	39.75	37.79
		27.70	29.71	28.69	25.48	27.89	27.70	29.71	28.69	25.48	27.89
		15.14	19.50	16.85	15.21	16.68	15.14	19.50	16.85	15.21	16.68
		14.05	11.42	17.58	15.19	14.56	14.05	11.42	17.58	15.19	14.56
4 33% of 1.5X GSP	15 gal/a	104	201	302	404	Mean =	104	201	302	404	Mean =
		73.90	61.30	53.70	69.60	64.63	73.90	61.30	53.70	69.60	64.63
		23.8	22.5	24.1	28.2	24.7	23.8	22.5	24.1	28.2	24.7
		0.5	0.4	0.1	1.0	0.5	0.5	0.4	0.1	1.0	0.5
		5.7	4.7	4.1	5.3	5.0	5.7	4.7	4.1	5.3	5.0
		30.0	27.7	28.4	34.6	30.2	30.0	27.7	28.4	34.6	30.2
		24.4	23.0	24.2	29.2	25.2	24.4	23.0	24.2	29.2	25.2
		39.40	37.70	34.32	39.75	37.79	39.40	37.70	34.32	39.75	37.79
		27.70	29.71	28.69	25.48	27.89	27.70	29.71	28.69	25.48	27.89
		15.14	19.50	16.85	15.21	16.68	15.14	19.50	16.85	15.21	16.68
		14.05	11.42	17.58	15.19	14.56	14.05	11.42	17.58	15.19	14.56

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Rating Date	Sep-18-2024		
SE Description			
Part Rated	TUBER, C		
Rating Type	14 oz+		
Rating Unit	% of #1s		
Sample Size	1 PLOT		
Collection Basis	1 PLOT		
Reporting Basis			
Crop Name	Potato		
Crop Variety	Clearwater		
Days After First/Last Applic.	142, 142		
Trt Treatment	Rate		
No. Name	Rate Unit Plot	20	
1 GSP	10 gal/a	101	4.20
		203	4.56
		301	4.92
		402	2.31
	Mean =		4.00
2 50% GSP	10 gal/a	102	4.43
		204	3.75
		303	0.40
		401	5.96
	Mean =		3.64
3 50% of 1.5X GSP	15 gal/a	103	5.20
		202	2.85
		304	0.42
		403	5.06
	Mean =		3.38
4 33% of 1.5X GSP	15 gal/a	104	3.71
		201	1.67
		302	2.55
		404	4.37
	Mean =		3.08

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Part Rated

PLANT = plant
 CANOPY = canopy
 TUGR1 = tuber - grade 1
 TUGR2 = tuber - grade 2
 TUBUNM = tuber - unmarketable
 TUBTOT = tuber - total
 TUBMAR = tuber - marketable
 TUBER = tuber
 C = Crop is Part Rated

Rating Type

COUNT = count
 PHYGEN = phytotoxicity - general / injury
 CABERO = canopy - between row
 YIELD = yield

Rating Unit

NUMBER, , , = number
 %, 0, 100, = percent
 LB, , , = pound
 T-US, , , = ton (short=2000 lb)

ROWFT = row-foot
 PLOT = total plot
 A = acre

PLOT = total plot
 FT2 = square foot

ROWFT = row-foot
 PLOT = total plot
 A = acre

ARM Action Codes

TY1 = 0.0768254*[C8]
 TY2 = 0.0768254*[C9]
 TY3 = 0.0768254*[C10]
 T4 = [11]+[12]+[13]

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 Investigator: Mark Qualls

Rating Date	May-28-2024	May-28-2024	Jun-7-2024	Jun-7-2024	Jun-17-2024	Jun-24-2024	Jul-15-2024	Sep-10-2024	Sep-10-2024	Sep-10-2024	
SE Description	Plant Stand	% General phyto>	Plant Stand	% General phyto>	% Row Closure	% Row Closure	% Row Closure	TUGR1, C	TUGR2, C	TUBUNM, C	
Part Rated	PLANT, -	PLANT, -	PLANT, -	PLANT, -	CANOPY, C	CANOPY, C	CANOPY, C	YIELD	YIELD	YIELD	
Rating Type	COUNT	PHYGEN	COUNT	PHYGEN	CABERO	CABERO	CABERO	LB	LB	LB	
Rating Unit	NUMBER	%	NUMBER	%	%	%	%	FT2	FT2	FT2	
Sample Size	100 ROWFT	1 PLOT	100 ROWFT	1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT	
Collection Basis	1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT	283.5 FT2	283.5 FT2	283.5 FT2	
Reporting Basis	100 ROWFT	1 PLOT	100 ROWFT	1 PLOT	1 PLOT	1 PLOT	1 PLOT				
Crop Name	Potato	Potato	Potato	Potato	Potato	Potato	Potato	Potato	Potato	Potato	
Crop Variety	Clearwater	Clearwater	Clearwater	Clearwater	Clearwater	Clearwater	Clearwater	Clearwater	Clearwater	Clearwater	
Days After First/Last Applic.	29, 29	29, 29	39, 39	39, 39	49, 49	56, 56	77, 77	134, 134	134, 134	134, 134	
Trt Treatment	Rate	1	2	3	4	5	6	7	8	9	10
No. Name	Rate Unit										
1 GSP	10 gal/a	68.8 a	0.0 na	85.5 a	0.0 na	50.0 na	70.0 na	100.0 na	310.45 a	6.235 a	57.40 a
2 50% GSP	10 gal/a	67.0 a	0.0 na	90.3 a	0.0 na	50.0 na	70.0 na	100.0 na	312.33 a	5.375 a	60.03 a
3 50% of 1.5X GSP	15 gal/a	70.0 a	0.0 na	92.3 a	0.0 na	50.0 na	70.0 na	100.0 na	322.15 a	5.365 a	62.80 a
4 33% of 1.5X GSP	15 gal/a	68.3 a	0.0 na	86.5 a	0.0 na	50.0 na	70.0 na	100.0 na	321.10 a	6.855 a	64.63 a
LSD P=.05	11.17	.	6.40	.	.	.	.	.	25.371	5.1992	14.403
Standard Deviation	6.98	0.00	4.00	0.00	0.00	0.00	0.00	0.00	15.861	3.2503	9.004
CV	10.2	0.0	4.52	0.0	0.0	0.0	0.0	0.0	5.01	54.56	14.71
Levene's F^	2.283	.	1.582	.	.	.	.	.	0.10	0.217	1.35
Levene's Prob(F)	0.131	.	0.245	.	.	.	.	.	0.958	0.883	0.305
Shapiro-Wilk^	0.9535	.	0.9832	.	.	.	.	.	0.951	0.9158	0.9512
P(Shapiro-Wilk)^	0.5478	.	0.9837	.	.	.	.	.	0.5054	0.1445	0.5097
Skewness^	-0.39	.	0.2778	.	.	.	.	.	0.064	-0.7098	-0.076
P(Skewness)^	0.5362	.	0.6584	.	.	.	.	.	0.9186	0.2672	0.9035
Kurtosis^	-0.0142	.	0.0869	.	.	.	.	.	-0.8974	-0.4162	-0.701
P(Kurtosis)^	0.9907	.	0.9428	.	.	.	.	.	0.4627	0.7315	0.5648
Replicate F	2.245	NaN	1.191	NaN	NaN	NaN	NaN	NaN	5.464	1.760	0.245
Replicate Prob(F)	0.1523	NaN	0.3671	NaN	NaN	NaN	NaN	NaN	0.0205	0.2245	0.8631
Treatment F	0.126	NaN	2.501	NaN	NaN	NaN	NaN	NaN	0.568	0.199	0.495
Treatment Prob(F)	0.9421	NaN	0.1254	NaN	NaN	NaN	NaN	NaN	0.6500	0.8948	0.6945

Means followed by same letter or symbol do not significantly differ (P=.05, Duncan's New MRT).
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
 Could not calculate LSD (% mean diff) or mean separation letters for columns 2,4,5,6,7 because error variance is 0.
 Mean separation letters are 'na' (not applicable) when error variance is 0
 ^Calculated from residual.

Qualls Agricultural Laboratory

Bluefield Seeding Potato Seed Starter Fertilizer Reduction Trial

Trial ID: Bluefield_QAL_24-01_Potato
 Protocol ID: Bluefield_QAL_24-01 Location: Ephrata, WA Trial Year: 2024
 Study Director: Craig McCloskey Sponsor Contact:
 Investigator: Mark Qualls

Rating Date	Sep-10-2024	Sep-10-2024	Sep-10-2024	Sep-10-2024	Sep-10-2024	Sep-18-2024	Sep-18-2024	Sep-18-2024	Sep-18-2024	Sep-18-2024	
SE Description	TUGR1, C	TUGR2, C	TUBUNM, C	TUBTOT, C	TUBMAR, C	TUBER, C	TUBER, C	TUBER, C	TUBER, C	TUBER, C	
Part Rated	TUGR1, C	TUGR2, C	TUBUNM, C	TUBTOT, C	TUBMAR, C	TUBER, C	TUBER, C	TUBER, C	TUBER, C	TUBER, C	
Rating Type	YIELD	YIELD	YIELD	YIELD	YIELD	4-6 oz	6-8 oz	8-10 oz	10-14 oz	14 oz+	
Rating Unit	T-US	T-US	T-US	T-US	T-US	% of #1s	% of #1s	% of #1s	% of #1s	% of #1s	
Sample Size	1 A	1 A	1 A	1 A	1 A	1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT	
Collection Basis	283.5 FT2	283.5 FT2	283.5 FT2	283.5 FT2	283.5 FT2	1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT	
Reporting Basis				1 A	1 A						
Crop Name	Potato	Potato	Potato	Potato	Potato	Potato	Potato	Potato	Potato	Potato	
Crop Variety	Clearwater	Clearwater	Clearwater	Clearwater	Clearwater	Clearwater	Clearwater	Clearwater	Clearwater	Clearwater	
Days After First/Last Applic.	134, 134	134, 134	134, 134	134, 134	134, 134	142, 142	142, 142	142, 142	142, 142	142, 142	
Trt Treatment	11	12	13	14	15	16	17	18	19	20	
Rate											
No. Name											
1 GSP	10 gal/a	23.9 a	0.5 a	4.4 a	28.7 a	24.3 a	37.50 a	27.83 a	17.70 a	12.97 a	4.00 a
2 50% GSP	10 gal/a	24.0 a	0.4 a	4.6 a	29.0 a	24.4 a	38.96 a	27.11 a	18.11 a	12.18 a	3.64 a
3 50% of 1.5X GSP	15 gal/a	24.7 a	0.4 a	4.8 a	30.0 a	25.2 a	38.15 a	30.37 a	16.09 a	12.00 a	3.38 a
4 33% of 1.5X GSP	15 gal/a	24.7 a	0.5 a	5.0 a	30.2 a	25.2 a	37.79 a	27.89 a	16.68 a	14.56 a	3.08 a
LSD P=.05	1.95	0.40	1.11	2.45	2.00	5.709	3.167	3.437	4.670	2.669	
Standard Deviation	1.22	0.25	0.69	1.53	1.25	3.569	1.980	2.148	2.919	1.668	
CV	5.01	54.56	14.71	5.2	5.05	9.37	7.0	12.53	22.58	47.36	
Levene's F^	0.10	0.217	1.35	7.927*	0.412	0.191	0.45	0.482	0.351	1.24	
Levene's Prob(F)	0.958	0.883	0.305	0.004*	0.747	0.90	0.722	0.701	0.789	0.338	
Shapiro-Wilk^	0.951	0.9158	0.9512	0.9624	0.9505	0.9152	0.9525	0.9148	0.9549	0.9778	
P(Shapiro-Wilk)^	0.5054	0.1445	0.5097	0.7058	0.4971	0.1414	0.53	0.1389	0.5712	0.9438	
Skewness^	0.064	-0.7098	-0.076	0.2498	0.315	-0.2627	0.6177	0.5061	-0.4673	-0.3171	
P(Skewness)^	0.9186	0.2672	0.9035	0.6908	0.6165	0.6758	0.3318	0.4241	0.4598	0.6142	
Kurtosis^	-0.8974	-0.4162	-0.701	-0.6334	-0.839	-0.8673	0.2378	-1.0905	-0.0569	-0.1226	
P(Kurtosis)^	0.4627	0.7315	0.5648	0.6025	0.4918	0.4776	0.8444	0.3742	0.9625	0.9194	
Replicate F	5.464	1.760	0.245	3.573	6.297	0.273	1.095	0.142	0.218	1.800	
Replicate Prob(F)	0.0205	0.2245	0.8631	0.0599	0.0137	0.8432	0.4001	0.9322	0.8812	0.2172	
Treatment F	0.568	0.199	0.495	0.839	0.563	0.126	2.070	0.743	0.640	0.220	
Treatment Prob(F)	0.6500	0.8948	0.6945	0.5060	0.6528	0.9423	0.1745	0.5529	0.6082	0.8802	

Means followed by same letter or symbol do not significantly differ (P=.05, Duncan's New MRT).
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
 Could not calculate LSD (% mean diff) or mean separation letters for columns 2,4,5,6,7 because error variance is 0.
 Mean separation letters are 'na' (not applicable) when error variance is 0
 ^Calculated from residual.

Qualls Agricultural Laboratory

Bluefield Seeding Potato Seed Starter Fertilizer Reduction Trial

Trial ID: Bluefield_QAL_24-01_Potato
 Protocol ID: Bluefield_QAL_24-01 Location: Ephrata, WA Trial Year: 2024
 Study Director: Craig McCloskey Sponsor Contact:
 Investigator: Mark Qualls

Part Rated

PLANT = plant
 CANOPY = canopy
 TUGR1 = tuber - grade 1
 TUGR2 = tuber - grade 2
 TUBUNM = tuber - unmarketable
 TUBTOT = tuber - total
 TUBMAR = tuber - marketable
 TUBER = tuber
 C = Crop is Part Rated

Rating Type

COUNT = count
 PHYGEN = phytotoxicity - general / injury
 CABERO = canopy - between row
 YIELD = yield

Rating Unit

NUMBER, , , = number
 %, 0, 100, = percent
 LB, , , = pound
 T-US, , , = ton (short=2000 lb)

ROWFT = row-foot
 PLOT = total plot
 A = acre

PLOT = total plot
 FT2 = square foot

ROWFT = row-foot
 PLOT = total plot
 A = acre

ARM Action Codes

TY1 = 0.0768254*[C8]
 TY2 = 0.0768254*[C9]
 TY3 = 0.0768254*[C10]
 T4 = [11]+[12]+[13]

Trial Comments

4/29/24 Planting and application

Monday, April 29, 2024

3:30 PM

All of the plots were planted with QAL's potato carousel planter. Seed pieces were dropped in an open furrow on 12" inch seed spacing down the row. For each treatment, the product was put on at the protocol rate and spray length. After application, the potato rows were hilled up.

5/28/24 stand counts/phyto

Wednesday, May 29, 2024

1:24 PM

Qualls Agricultural Laboratory

Bluefield Seeding Potato Seed Starter Fertilizer Reduction Trial

Trial ID: Bluefield_QAL_24-01_Potato
Protocol ID: Bluefield_QAL_24-01 Location: Ephrata, WA Trial Year: 2024
Study Director: Craig McCloskey Sponsor Contact:
Investigator: Mark Qualls

Early stand counts taken on 5/28. Emerged potato plants were counted in the middle 2 rows of each 4 row plot x 50' for a total of 100 row feet. Phyto rating taken on 5/29. All treatments are looking good with no phytotoxicity visible in the treatments. Early emergence is variable due most likely to hand planting the crop. There is no treatment trend to the emergence

6/7/24 Final Stand Counts

Friday, June 7, 2024

2:11 PM

All plots are fully emerged. Stand counts taken on the middle two rows (50ft each) and reported as the number of plants per 100ft. Seed spacing down the row is 12" so there should be ~100 plants in each treatment. This spring has been extremely windy and hard on the plants so there are some plants missing. There are no significant differences between treatments and no phytotoxicity in any of the treatments.

6/17/24 Row Closure rating

Monday, June 17, 2024

1:49 PM

Rating was taken on a per plot basis looking at % row closure. This is a subjective evaluation and at this event no significant differences between treatments is visible.

6/24/24 Row Closure Rating

Monday, June 24, 2024

3:00 PM

Rating was taken on a per plot basis looking at % row closure. This is a subjective evaluation and at this event no significant differences between treatments is visible.

7/1/24 trial visit

Monday, July 1, 2024

9:12 AM

All plots look good with no vigor differences or Phyto apparent.

7/15/24 Row Closure Rating

Saturday, June 15, 2024

2:00 PM

Qualls Agricultural Laboratory

Bluefield Seeding Potato Seed Starter Fertilizer Reduction Trial

Trial ID: Bluefield_QAL_24-01_Potato
 Protocol ID: Bluefield_QAL_24-01 Location: Ephrata, WA Trial Year: 2024
 Study Director: Craig McCloskey Sponsor Contact:
 Investigator: Mark Qualls

Rows are closed now and final rating taken. No significant differences between treatments.

9/10/24 Harvest

Tuesday, September 10, 2024

2:00 PM

Tuber Harvest: Harvest was conducted using Qualls Agricultural Laboratories 2 row research dfddffpotato harvester. This harvester was built specifically for harvesting the middle two rows by 50 ft (283.5 ft²) and sorting the potatoes into 3 USDA marketable grades for processing (US #1, US #2 and Culls/Undersize). The harvester weighs each grade separately using a custom made software/hardware package built by Rice Lake Scales. The US #1 tubers from each plot were saved and brought back to QAL's facility for close grading.

9/10/24 Yield Data explained.

Thursday, October 24, 2024

11:18 AM

Yield data in the Assessment Data is as following:

Column

8. -Lbs of US #1 tubers in each plot (2 rows x 50' or 283.5 ft²)
9. -Lbs of US # 2 tubers in each plot
10. -Lbs of culls and undersize tubers in each plot
11. -Tons of US #1 tubers/acre (calculated)
12. -Tons of US #2 tubers/acre (calculated)
13. -Tons of culls and undersize tubers/acre (calculated)
14. -Total yield of tubers tons/acre (calculated)
15. -Total yield of marketable tubers US #1s and #2s combined tons/acre.

9/18/24 Close Grading

Wednesday, September 18, 2024

11:05 AM

US #1 tubers from each plot were graded by tuber weight using QAL's potato cup sizer line. Potatoes were divided into 5 categories: 4-6 oz, 6-8 oz, 8-10 oz, 10-14 oz and 14+ oz tubers. Data is listed in columns 16-20 of the assessment data. The categories are in % of the total US #1's taken from the plot area. This can also be extrapolated to % size category/Acre.

Qualls Agricultural Laboratory

Bluefield Seeding Potato Seed Starter Fertilizer Reduction Trial

Trial ID: Bluefield_QAL_24-01_Potato
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