

Potato Seed Treatment Trial Results 2012

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NPPGA Research Reporting Conference
February 19, 2013

Trials

- ∞ In 2012 we conducted five seed treatment and in-furrow at planting trials for disease control: four for Rhizoctonia stem, stolon and black scurf, one for silver scurf
- ∞ Four Inkster irrigated RB for Rhizoctonia
 - ∞ 2600; BASF product Priaxor: Headline (pyraclostrobin QoI) + Xemium (fluxopyroxad SDHI)
 - ∞ 2700; mostly seed treatment with registered and experimental compounds;
 - ∞ Emesto; Bayer Proline (prothioconazole) + penflufen SDHI
 - ∞ Vertisan/Fontelis; DuPont penthiopyrad SDHI with or without Evergol
 - ∞ Wibur Ellis, confidentials, standards



∞ 2800; In furrow at planting DuPont Vertisan + Vydate

∞ 2900; Organic seed treatments

- ∞ **Regalia** Marrone biofungicide; ai *Reynutria sachalinensis* (giant knotweed) that induces systemic resistance
- ∞ **Serenade** Bayer (Agraquest); ai *Bacillus subtilis* that induces systemic resistance
- ∞ **ActinoGrow** Sipcam; ai *Streptomyces lydicus* that inhibits pathogen growth



- ∞ 2500 Grand Forks not irrigated Syngenta Sedaxane (SDHI); silver scurf, Red Norland
- ∞ Trials cut, treated and planted in two days
- ∞ Trials not inoculated but relied on natural seed-borne inoculum
 - ∞ Rhizoctonia ~5% on seed
 - ∞ Silver scurf ~ 10% on seed

Table 1. Evaluation of Vibrance (sedaxane) seed treatment for silver scurf control at Grand Forks 2012 (2500)

Treatment	Silver scurf Incidence %	Silver scurf Severity %	Yield	Grade 10-12 oz
Not treated	5.4	0.67	198	16.5
Cruiser	0.44	0.20	181	24.2
Cruiser Vibrance	0.13	0.20	243	24.7
Cruiser Vibrance 1.5x	0.38	0.24	227	21.8
Cruiser Vibrance 2.5x	0.15	0.19	261	29.5
Cruiser Vibrance 5x	0.67	0.25	242	33.9
Cruiser maxx D + Vibrance 2.5x	0.10	0.17	240	32.4
Maxim 4FS + Quadris 0.6	0.10	0.13	190	15.5
Phostrol 10 pts dime + dime 14 day	0.23	0.74	188	12.1
LSD $p > 0.05$	1.3	0.12	52.4	11.8

* 4-6 oz, 6-8 oz, 8-10 oz NS

Table 2. Evaluation of Priaxor In-furrow at planting for Rhizoctonia control at Inkster 2012 (2600)

Treatment	Rhizoc 52 DAP		Rhizoc 80 DAP						
	% stem Rhizoc	% stolon Rhizoc	% stem Rhizoc	% stems girdled	% stolon Rhizoc	% stolon girdled	Yield	Marketable %	% Rhizoc 75 DAH
Not treated	50.8	10.5	73.6	26.7	29.8	10.0	402	82	1.4
BAS 700 4F	47.2	9.2	48.7	8.2**	14.2	0.8	355	83	0.8
Priaxor 6.7 oz	41.9	8.2	59.2	8.3**	8.7	2.4	379	79	0.8
Priaxor 8 oz	35.2	11.3	54.1	14.2	8.5	1.0	390	85	0.6
Quadris	43.7	10.7	64.2	10.0**	4.4	1.0	389	73	0.6
LSD $p > 0.05$	30.1	14.1	82.8	21.8	29.4	6.6	390	83	0.6
LSD $p > 0.05$	NS	NS	22.4	NS	15.7	6.4	NS	—	0.18

** LSD $p > 0.10$





Table 3. Evaluation of seed and in-furrow
at planting treatments for *Rhizoctonia*
control at Inkster 51 DAP (2700)



Treatment	Rate	Application	% stem Rhizoc	% stem girdled	% stolon with Rhizoc	% stolon girdled
Non-treated	-	-	60.0	37.5	11.8	7.5
Vertisan EC	0.7 fl oz / 1000 row ft	In-furrow	81.4	41.0	35.1	18.1
Vertisan EC	1.15 fl oz / 1000 row ft	In-furrow	68.8	25.8	13.7	3.5
Vertisan EC	1.6 fl oz / 1000 row ft	In-furrow	75.4	50.9	38.9	13.9
Fontelis + Dithane F45	0.15 fl oz / cwt + 0.9 fl oz / cwt	Seed	55.8	2.9	13.9	4.9
Fontelis + Dithane F45	0.3 fl oz / cwt + 0.9 fl oz / cwt	Seed	41.8	8.2	7.9	2.5
Fir Bark	0.5 lb / cwt	Seed	56.8	42.5	30.2	16.2
Ernesto Silver + Fir Bark	0.31 fl oz / cwt + 0.5 lb / cwt	Seed	42.6	8.1	7.5	3.8
Admire Pro	8.7 fl oz / a	In-furrow				
Ernesto Silver + Fir Bark	0.31 fl oz / cwt + 0.5 lb / cwt	Seed	31.9	0.0	0.6	0.0
EverGol Prime + Admire Pro	0.41 fl oz / 1000 row ft + 8.7 fl oz / a	In-furrow				
WE1042-2	1 lb / cwt	Seed	35.3	14.3	5.7	0.7
WE1043-1	1 lb / cwt	Seed	48.4	21.7	18.7	7.9
WE1224-1	1 lb / cwt	Seed	70.9	21.6	37.8	23.1
WE1044-1	1 lb / cwt	Seed	47.3	20.5	14.1	10.3
Maxim 4FS + WE1042-2	0.08 fl oz / cwt + 1 lb / cwt	Seed	48.7	9.5	4.2	1.0
Penthiopyrad	0.5 g ai / cwt	Seed	42.9	6.3	4.9	0.0
Maxim 4FS	0.08 fl oz / cwt	Seed	41.6	14.2	2.4	0.0
Maxim 4FS	0.08 fl oz / cwt	Seed	36.3	15.7	1.4	0.0
Quadris	0.8 fl oz / 1000 row ft	In-furrow				
Quadris	0.8 fl oz / 1000 row ft	In-furrow	54.4	28.3	19.7	4.4
Maxim MZ	8 oz / cwt	Seed	56.4	11.8	14.7	5.6
Maxim Mz	8 oz / cwt	Seed	40.6	1.3	8.1	0.0
Quadris	0.8 fl oz / 1000 row ft	In-furrow				
Moncut	0.79 oz / 1000 row ft	In-furrow	66.9	30.8	25.7	5.3
Moncoat MZ	1 lb / cwt	Seed	40.2	7.5	2.5	0.0
6% Mancozeb	1 lb / cwt	Seed	49.6	29.7	19.0	5.0
LSD $p > 0.05$			24.0	17.7	NS	NS





Table 4. Evaluation of seed and in-furrow
at planting treatments for Rhizoctonia
control at Inkster 2012 (82 DAP) 2700



Treatment	Rate	Application	% stem Rhizoc	% stem girdled	% stolon Rhizoc	% stolon girdled
Non-treated	-	-	86.3	69.1	50.4	35.7
Vertisan EC	0.7 fl oz / 1000 row ft	In-furrow	67.0	52.8	26.6	17.9
Vertisan EC	1.15 fl oz / 1000 row ft	In-furrow	85.3	53.7	20.2	10.0
Vertisan EC	1.6 fl oz / 1000 row ft	In-furrow	74.7	56.3	17.9	4.7
Fontelis + Dithane F45	0.15 fl oz / cwt + 0.9 fl oz / cwt	Seed	82.4	26.8	27.7	3.6
Fontelis + Dithane F45	0.3 fl oz / cwt + 0.9 fl oz / cwt	Seed	65.0	23.8	24.9	11.6
Fir Bark	0.5 lb / cwt	Seed	98.3	82.0	33.2	20.3
Emesto Silver + Fir Bark	0.31 fl oz / cwt + 0.5 lb / cwt	Seed	59.1	26.9	35.2	18.2
Admire Pro	8.7 fl oz / a	In-furrow				
Emesto Silver + Fir Bark	0.31 fl oz / cwt + 0.5 lb / cwt	Seed				
EverGol Prime + Admire Pro	0.41 fl oz / 1000 row ft + 8.7 fl oz / a	In-furrow	66.5	26.1	21.0	8.6
WE1042-2	1 lb / cwt	Seed	62.7	34.4	24.2	13.8
WE1043-1	1 lb / cwt	Seed	85.3	43.5	25.6	4.2
WE1224-1	1 lb / cwt	Seed	78.6	30.2	14.4	2.9
WE1044-1	1 lb / cwt	Seed	72.4	47.6	42.0	12.9
Maxim 4FS + WE1042-2	0.08 fl oz / cwt + 1 lb / cwt	Seed	63.0	26.8	28.8	10.8
Maxim 4FS	0.08 fl oz / cwt	Seed	77.2	36.8	15.4	2.5
Maxim 4FS	0.08 fl oz / cwt	Seed	72.0	19.5	12.7	9.5
Quadris	0.8 fl oz / 1000 row ft	In-furrow				
Quadris	0.8 fl oz / 1000 row ft	In-furrow	87.3	58.5	48.3	26.2
Maxim MZ	8 oz / cwt	Seed	48.2	12.5	16.5	1.9
Maxim Mz	8 oz / cwt	Seed				
Quadris	0.8 fl oz / 1000 row ft	In-furrow	34.0	6.8	8.5	0.0
Moncut	0.79 oz / 1000 row ft	In-furrow	94.7	79.0	56.9	25.7
Moncoat MZ	1 lb / cwt	Seed	43.9	16.9	9.2	2.9
6% Mancozeb	1 lb / cwt	Seed	62.7	50.5	42.3	18.1
LSD _{p> 0.05}			20.4	20.7	19.4	13.7





Table 5. Evaluation of seed and in-furrow
at planting on yield and post harvest
Rhizoctonia control at Inkster 2012 (2700)



Treatment	Rate	Application	Total Yield (cwt/a)	Total Marketable (>4oz) %	Rhizoc (%) Post harvest
Non-treated	-	-	391.6	76.2	1.0
Vertisan EC	0.7 fl oz / 1000 row ft	In-furrow	430.5	68.3	0.6
Vertisan EC	1.15 fl oz / 1000 row ft	In-furrow	416.4	69.4	0.7
Vertisan EC	1.6 fl oz / 1000 row ft	In-furrow	451.4	69.2	1.3
Fontelis + Dithane F45	0.15 fl oz / cwt + 0.9 fl oz / cwt	Seed	437.4	63.4	0.2
Fontelis + Dithane F45	0.3 fl oz / cwt + 0.9 fl oz / cwt	Seed	404.9	81.5	0.3
Fir Bark	0.5 lb / cwt	Seed	446.2	74.6	0.7
Emesto Silver + Fir Bark	0.31 fl oz / cwt + 0.5 lb / cwt	Seed	385.4	88.7	0.7
Admire Pro	8.7 fl oz / a	In-furrow			
Emesto Silver + Fir Bark	0.31 fl oz / cwt + 0.5 lb / cwt	Seed	432.8	72.8	0.1
EverGol Prime + Admire Pro	0.41 fl oz / 1000 row ft + 8.7 fl oz / a	In-furrow			
WE1042-2	1 lb / cwt	Seed	454.1	71.5	0.7
WE1043-1	1 lb / cwt	Seed	431.2	77.6	0.7
WE1224-1	1 lb / cwt	Seed	444.8	69.6	0.5
WE1044-1	1 lb / cwt	Seed	440.6	68.7	0.7
Maxim 4FS + WE1042-2	0.08 fl oz / cwt + 1 lb / cwt	Seed	427.5	63.2	0.4
Maxim 4FS	0.08 fl oz / cwt	Seed	426.7	75.0	0.5
Maxim 4FS	0.08 fl oz / cwt	Seed	425.5	69.6	0.1
Quadris	0.8 fl oz / 1000 row ft	In-furrow			
Quadris	0.8 fl oz / 1000 row ft	In-furrow	434.2	75.0	0.2
Maxim MZ	8 oz / cwt	Seed	447.5	80.4	0.8
Maxim Mz	8 oz / cwt	Seed	436.8	81.5	0.3
Quadris	0.8 fl oz / 1000 row ft	In-furrow			
Moncut	0.79 oz / 1000 row ft	In-furrow	408.6	76.0	0.7
Moncoat MZ	1 lb / cwt	Seed	423.2	80.8	0.1
6% Mancozeb	1 lb / cwt	Seed	434.7	66.8	0.9
LSD $p > 0.05$			NS		0.1





Table 6. Evaluation of organic in-furrow
at planting treatments for Rhizoctonia
control at Inkster 51 DAP 2012 (2900)



Treatment	Rate	Schedule	Company	%stem Rhizoc	% stem girdled	% stolon Rhizoc
Non-treated	-	-	Control	51.4	24.6	16.8
Regalia	2 fl oz / 1000 row ft	In-furrow	Marrone	54.1	29.5	10.6
Regalia	4 fl oz / 1000 row ft	In-furrow	Marrone	29.3	3.3	3.5
Regalia	8 fl oz / 1000 row ft	In-furrow	Marrone	71.8	40.4	19.6
Regalia	16 fl oz / 1000 row ft	In-furrow	Marrone	74.3	43.5	19.0
Regalia + Quadris	2 fl oz / 1000 row ft + 0.6 fl oz / 1000 row ft	In-furrow	Marrone	45.5	24.0	16.4
Regalia + Moncut	2 fl oz / 1000 row ft + 0.79 oz / 1000 row ft	In-furrow	Marrone	68.5	46.6	18.4
Serenade Soil	4.4 fl oz / 1000 row ft	In-furrow	Agraquest	62.7	34.9	13.0
Serenade Soil + Quadris	2.2 fl oz / 1000 row ft + 0.41 fl oz / 1000 row ft	In-furrow	Agraquest	79.4	51.5	29.2
Serenade Soil + Quadris	4.4 fl oz / 1000 row ft + 0.41 fl oz / 1000 row ft	In-furrow	Agraquest	51.4	20.8	10.5
Serenade Soil + Quadris	2.2 fl oz / 1000 row ft + 0.62 fl oz / 1000 row ft	In-furrow	Agraquest	60.8	29.7	17.9
Serenade Soil + Moncut	2.2 fl oz / 1000 row ft + 0.83 oz / 1000 row ft	In-furrow	Agraquest	23.4	9.8	1.4
ActinoGrow	4 oz / a	In-furrow	Sipcam	80.8	44.8	25.9
ActinoGrow	6 oz / a	In-furrow	Sipcam	73.5	38.0	26.3
Quadris	0.6 fl oz / 1000 row ft	In-furrow	Control	67.1	40.8	9.9
Moncut	0.79 oz / 1000 row ft	In-furrow	Control	52.4	35.8	13.2
Maxim 4FS	0.08 fl oz / cwt	Seed	Control	39.4	8.4	7.9
Maxim 4FS	0.08 fl oz / cwt	Seed	Control	30.4	7.6	3.6
Quadris	0.6 fl oz / 1000 row ft	In-furrow	Control	30.4	7.6	3.6
LSD $p>0.05$				21.21	21.48	15.38





Table 7. Evaluation of organic in-furrow
at planting treatments for Rhizoctonia
control at Inkster 80 DAP 2012 (2900)



Treatment	Rate	Schedule	Company	%stem Rhizoc	% stem girdled	% stolon Rhizoc	% stolon girdled
Non-treated	-	-	Control	96.3	72.4	39.4	15.5
Regalia	2 fl oz / 1000 row ft	In-furrow	Marrone	98.3	85.1	38.3	10.8
Regalia	4 fl oz / 1000 row ft	In-furrow	Marrone	81.7	45.4	20.5	10.5
Regalia	8 fl oz / 1000 row ft	In-furrow	Marrone	90.0	90.1	40.8	9.5
Regalia	16 fl oz / 1000 row ft	In-furrow	Marrone	84.5	53.8	32.3	10.5
Regalia + Quadris	2 fl oz / 1000 row ft + 0.6 fl oz / 1000 row ft	In-furrow	Marrone	76.3	51.7	38.2	15.9
Regalia + Moncut	2 fl oz / 1000 row ft + 0.79 oz / 1000 row ft	In-furrow	Marrone	87.5	75.0	43.3	20.7
Serenade Soil	4.4 fl oz / 1000 row ft	In-furrow	Agraquest	91.7	68.3	39.6	22.2
Serenade Soil + Quadris	2.2 fl oz / 1000 row ft + 0.41 fl oz / 1000 row ft	In-furrow	Agraquest	95.7	72.9	39.0	11.4
Serenade Soil + Quadris	4.4 fl oz / 1000 row ft + 0.41 fl oz / 1000 row ft	In-furrow	Agraquest	95.5	64.9	29.3	7.2
Serenade Soil + Quadris	2.2 fl oz / 1000 row ft + 0.62 fl oz / 1000 row ft	In-furrow	Agraquest	87.1	56.6	32.5	12.2
Serenade Soil + Moncut	2.2 fl oz / 1000 row ft + 0.83 oz / 1000 row ft	In-furrow	Agraquest	80.1	62.5	28.3	10.5
ActinoGrow	4 oz / a	In-furrow	Sipcam	92.5	78.1	31.3	21.4
ActinoGrow	6 oz / a	In-furrow	Sipcam	90.5	69.0	46.3	16.9
Quadris	0.6 fl oz / 1000 row ft	In-furrow	Control	89.6	54.5	39.6	11.1
Moncut	0.79 oz / 1000 row ft	In-furrow	Control	82.8	34.4	29.1	6.8
Maxim 4FS	0.08 fl oz / cwt	Seed	Control	56.9	17.0	8.9	0.0
Maxim 4FS Quadris	0.08 fl oz / cwt 0.6 fl oz / 1000 row ft	Seed In-furrow	Control	60.4	15.5	3.2	0.4
LSD $p>0.05$				17.63	24.32	21.99	13.27





Table 8. Evaluation of organic in-furrow
at planting treatments for yield, marketable
and post harvest *Rhizoctonia* control at
Inkster 2012 (2900)



Treatment	Rate	Schedule	Company	Yield cwt/a	Total Marketable (>4oz) %	% Rhizoctonia on tuber
Non-treated	-	-	Control	399.4	87.7	0.4
Regalia	2 fl oz / 1000 row ft	In-furrow	Marrone	460.0	76.4	0.8
Regalia	4 fl oz / 1000 row ft	In-furrow	Marrone	417.8	77.6	0.7
Regalia	8 fl oz / 1000 row ft	In-furrow	Marrone	363.6	70.4	0.7
Regalia	16 fl oz / 1000 row ft	In-furrow	Marrone	372.3	79.2	1.1
Regalia + Quadris	2 fl oz / 1000 row ft + 0.6 fl oz / 1000 row ft	In-furrow	Marrone	410.8	79.6	0.6
Regalia + Moncut	2 fl oz / 1000 row ft + 0.79 oz / 1000 row ft	In-furrow	Marrone	348.4	76.9	0.8
Serenade Soil	4.4 fl oz / 1000 row ft	In-furrow	Agraquest	455.9	86.6	0.8
Serenade Soil + Quadris	2.2 fl oz / 1000 row ft + 0.41 fl oz / 1000 row ft	In-furrow	Agraquest	437.3	82.8	0.6
Serenade Soil + Quadris	4.4 fl oz / 1000 row ft + 0.41 fl oz / 1000 row ft	In-furrow	Agraquest	403.4	81.5	0.5
Serenade Soil + Quadris	2.2 fl oz / 1000 row ft + 0.62 fl oz / 1000 row ft	In-furrow	Agraquest	426.7	86.1	1.0
Serenade Soil + Moncut	2.2 fl oz / 1000 row ft + 0.83 oz / 1000 row ft	In-furrow	Agraquest	429.0	81.9	0.6
ActinoGrow	4 oz / a	In-furrow	Sipcam	394.5	86.6	0.7
ActinoGrow	6 oz / a	In-furrow	Sipcam	409.9	82.8	0.5
Quadris	0.6 fl oz / 1000 row ft	In-furrow	Control	384.8	82.6	0.7
Moncut	0.79 oz / 1000 row ft	In-furrow	Control	425.2	86.1	0.8
Maxim 4FS	0.08 fl oz / cwt	Seed	Control	437.8	82.4	0.1
Maxim 4FS	0.08 fl oz / cwt	Seed	Control	442.4	79.7	0.1
Quadris	0.6 fl oz / 1000 row ft	In-furrow	Control	442.4	79.7	0.1
LSD $p>0.05$				61.40	NA	NS

Summary



- ❧ Seed treatments and in-furrow at planting treatments resulted in better control of stolon Rhizoctonia compared to early stem Rhizoctonia
- ❧ Despite Rhizoctonia control, no significant increase in yield
 - ❧ However may be increase in quality and size distribution that would increase payable incentives for processing
- ❧ Organic in-furrow treatments did not result in control of Rhizoctonia

- ❧ Vibrance seed treatment reduced both incidence and severity of silver scurf; we will test additional SDHI fungicides in 2013
 - ❧ SS trial in Becker MN with high disease pressure

 - ❧ Previous work showed that Maxim ST + Quadris IF provided best reduction of SS, but SS still a problem
 - ❧ SS pressure variable the RRV and reading complicated by scab and other blemishes
 - ❧ Use Yukon Gold
 - ❧ Based on Vibrance trial , test all four new SDHI fungicides for activity
 - ❧ Vertisan (DuPont)
 - ❧ Emesto (Bayer)
 - ❧ Priaxor (BASF)
 - ❧ Vibrance (Syngenta)
- ❧ Continue seed treatment and in-furrow trials at Inkster for processing potatoes