

# Potato Seed Treatment And In-furrow Trial Results for Silver Scurf and Rhizoctonia in 2013

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# Trials

- ❧ In 2013 we conducted two silver scurf trials and three seed treatment/in-furrow trials for *Rhizoctonia*
- ❧ Silver Scurf
  - ❧ 7000, Becker, Paul Gray farm, irrigated, Dakota Pearl and Agata minitubers, silver scurf soil persistence
  - ❧ 800 Becker, Scott Hayes farm, irrigated, Yukon Gold, fungicides for silver scurf management
  - ❧ NO silver scurf observed in these trials; only black dot present on almost all tubers at harvest; tuned out to be a black dot blemish trial

# Trials

## ∞ Rhizoctonia

- ∞ 2500; Osage, MN, RDO, irrigated, RB, Bayer Emesto with and without Serenade in-furrow;
- ∞ 2700; Inkster, irrigated, RB, seed and in-furrow treatments with registered fungicides
- ∞ Vertisan, Priaxor, WE, Spirato, Emesto, Wibur Ellis, standards, confidentials

❧ 2800; Inkster, irrigated RB, seed and in-furrow treatments with biofungicides plus conventional fungicides

❧ Regalia, Emesto/Serenade, Double Nickel, standards

❧ **Regalia** Marrone biofungicide; ai *Reynutria sachalinensis* (giant knotweed) that induces systemic resistance

❧ **Serenade** Bayer (Agraquest); ai *Bacillus subtilis* that induces systemic resistance

❧ **DoubleNickel** (Certis) *Bacillus amyloliquefaciens* strain D747

∞ Trials cut, treated and planted in two days

∞ Trials not inoculated but relied on natural seed-borne inoculum

∞ Rhizoctonia ~5% on seed

∞ Silver scurf ~ 15% on seed

# H. solani soil persistence

- ❧ Greenhouse produced minitubers of two varieties from Valley Tissue free of *H. solani* were planted May 5 in five fields with 1-7 years since the last crop of potatoes
- ❧ Potatoes harvested September 4 and 200 tubers from each field site incubated for three weeks in plastic boxes to induce sporulation of *H. solani* to determine if *H. solani* survived in the soil
- ❧ Each tuber examined with a low power microscope for the presence of *H. solani*
- ❧ No *H. solani* was found, but black dot was found on some tubers. *H. solani* does not survive in Becker soils and seed – borne inoculum is most important source of SS

Table 1. Evaluation of seed treatment and in-furrow treatments for silver scurf control at Becker 2013 (800)

Treatment	Rate	Application	Stand				Yield	Blemish
			2-Jun	6-Jun	9-Jun	7-Jul	Cwt/a	%
Non-treated	-	-	56.5	70.0	76.0	76.5	324.6	30.4
Priaxor	8 fl oz / a	Seed	40.0	63.0	77.0	72.5	284.2	36.4
Emesto Silver	0.31 fl oz / cwt	Seed	56.5	70.5	74.5	78.0	231.7	40.9
Vertisan	1.6 fl oz / 1000 row ft	In-furrow	51.0	83.0	79.0	74.5	252.0	35.9
Penthiopyrad	0.5 g ai / cwt	Seed	50.0	73.0	83.5	79.0	272.7	37.5
Vibrance	0.077 fl oz / cwt	Seed	46.0	71.5	79.5	81.0	280.2	39.1
Blocker	10.4 fl oz / 1000 row ft	In-furrow	53.5	78.0	79.0	74.0	288.5	59.5
Regalia	8.8 fl oz / 1000 row ft	In-furrow	41.5	73.5	80.0	79.5	286.9	36.2
Serenade Soil	6.0 qt / a	In-furrow	60.0	74.0	80.5	81.5	250.9	55.5
ActinoGrow	12.0 oz / a	In-furrow	45.5	67.0	72.0	82.0	328.1	45.8
Maxim 4FS Quadris	0.08 fl oz / cwt 0.8 fl oz / 1000 row ft	Seed In-furrow	55.5	73.0	76.0	78.5	309.4	37.5
<b>LSD</b> $p>0.05$			NS	NS	NS	NS	NS	8.19

# Table 2. Evaluation of Emesto/Serenade for Rhizoctonia control at Osage 2013 (2500)

Treatment	Rate	Application	Rhizoctonia 45 DAP				Rhizoctonia 79 DAP				Yield cwt/a
			% stem Rhizoc	% stem girdled	% stolon Rhizoc	% stolon girdled	% stem Rhizoc	% stem girdled	% stolon Rhizoc	% stolon girdled	
Non-treated Admire Pro	8.7 fl oz/a	In Furrow	35.34	25.59	17.06	7.25	98.2	75.0	70.8	39.7	458.65
Emesto Silver + Nubark Mancozeb Admire Pro	0.31 fl oz / cwt + 16.0 oz / cwt 8.7 fl oz / a	Seed Seed In-furrow	5.42	0.84	0.00	0.00	71.3	23.5	35.3	5.2	496.15
Emesto Silver + Nubark Mancozeb Serenade Soil + Admire Pro	0.31 fl oz / cwt + 16.0 oz / cwt 2.0 qt / a + 8.7 fl oz / a	Seed Seed In-furrow In-furrow	6.00	0.00	5.00	5.00	84.0	39.7	53.6	9.7	462.57
Emesto Silver + Nubark Mancozeb Serenade Soil + Emesto Prime + Admire Pro	0.31 fl oz / cwt + 16.0 oz / cwt 2.0 qt / a + 0.4 fl oz / 1000 row ft + 8.7 fl oz / a	Seed Seed In-furrow In-furrow In-furrow	3.34	0.00	0.00	0.00	90.3	34.4	51.7	7.6	496.81
Emesto Silver + Nubark Mancozeb Serenade Soil + Admire Pro	0.31 fl oz / cwt + 16.0 oz / cwt 4.0 qt / a + 8.7 fl oz / a	Seed Seed In-furrow In-furrow	4.17	1.67	0.84	0.00	92.0	54.1	47.0	14.6	456.90
LSD $p>0.05$			11.74	8.54	8.45	NS*	16.76	24.85	21.52	14.87	36.31



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Table 3. Evaluation of seed and in-furrow  
at planting treatments for Rhizoctonia  
control at Inkster 42 DAP (2700)

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Treatment	Rate	Application	% stem Rhizoc	% stem girdled	% stolon Rhizoc	% stolon girdled	vigor	decay
Non-treated	-	-	45.3	10.3	28.3	7.6	2.5	57.0
Vertisan	24.0 fl oz / a	In-furrow	53.5	9.5	10.5	2.9	2.6	44.3
Priaxor	6.74 fl oz / a	In-furrow	48.9	14.4	20.6	7.6	2.3	38.8
Priaxor	8.0 fl oz / a	In-furrow	67.0	8.8	17.5	6.2	2.5	37.5
WE 1042-2	1.0 lb / cwt	Seed	53.5	15.3	10.2	0.0	2.4	50.5
WE 1043-1	1.0 lb / cwt	Seed	61.1	27.0	23.9	7.8	2.4	49.5
Maxim 4FS + WE 1042-2	0.08 fl oz / cwt + 1.0 lb / cwt	Seed	44.1	13.0	13.1	2.8	2.6	72.5
Quadris	12.4 fl oz / a	In-furrow	45.3	19.2	39.0	8.4	1.6	51.0
Vertisan	1 fl oz / 1000 row ft	In-furrow	67.1	14.5	21.4	5.4	2.3	66.3
Ernesto Silver	0.31 fl oz / cwt	Seed	57.8	5.6	15.4	1.2	2.2	35.3
S-2399 + Spirato 480 FS	0.2 fl oz / cwt + 0.08 fl oz / cwt	Seed	57.8	19.3	6.7	1.3	2.0	80.0
Spirato 480 FS	0.08 fl oz / cwt	Seed	59.0	20.3	16.2	2.5	2.0	76.0
ST-Methyl 540 FS + Spirato 480 FS	0.35 fl oz / cwt + 0.08 fl oz / cwt	Seed	56.0	16.5	19.7	4.6	2.2	53.8
ST-Methyl 540 FS + Spirato 480 FS	0.5 fl oz / cwt + 0.08 fl oz / cwt	Seed	56.8	10.5	15.2	2.3	2.4	40.5
ST-Methyl 540 FS + Spirato 480 FS	0.7 fl oz / cwt + 0.08 fl oz / cwt	Seed	50.6	9.2	18.2	1.7	2.5	66.8
Maxim 4 FS	0.08 fl oz / cwt	Seed	57.9	8.7	10.2	1.9	2.8	79.3
Quadris	9.0 fl oz / a	In-furrow	61.7	11.7	19.0	1.4	2.5	52.0
Maxim 4 FS Quadris	0.08 fl oz / cwt 9.0 fl oz / a	Seed In-furrow	53.1	23.5	16.2	5.0	2.6	89.3
Moncut	12.0 oz / a	In-furrow	51.7	19.2	8.0	0.0	2.5	47.8
Moncoat MZ	1.0 lb / cwt	Seed	66.9	15.9	14.0	1.9	2.4	43.0
Maxim MZ	0.5 lb / cwt	Seed	39.6	0.0	14.5	1.0	2.5	35.0
Moncut	0.79 oz / 1000 row ft	In-furrow	58.7	12.5	13.3	1.0	2.6	32.8
6% Mancozeb	1.0 lb / cwt	Seed	63.3	14.9	23.5	3.7	2.6	42.8
LSD <sub>p&gt;0.05</sub>			22.24	15.51	14.88	NS	0.44	26.74

Compared to the non-treated control

NS

NS


NS



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Table 4. Evaluation of seed and in-furrow  
at planting on yield and post harvest  
Rhizoctonia control at Inkster (2700)

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Treatment	Rate	Application	Yield Cwt/a	% Rhizoc 63-88 DAH
Non-treated	-	-	415.7	1.9
Vertisan	24.0 fl oz / a	In-furrow	387.3	0.3
Priaxor	6.74 fl oz / a	In-furrow	403.3	1.1
Priaxor	8.0 fl oz / a	In-furrow	395.5	0.1
WE 1042-2	1.0 lb / cwt	Seed	413.0	1.4
WE 1043-1	1.0 lb / cwt	Seed	386.3	0.6
Maxim 4FS + WE 1042-2	0.08 fl oz / cwt + 1.0 lb / cwt	Seed	393.5	1.4
Quadris	12.4 fl oz / a	In-furrow	395.3	0.2
Vertisan	1 fl oz / 1000 row ft	In-furrow	392.9	0.4
Emesto Silver	0.31 fl oz / cwt	Seed	385.5	1.2
Spirato 480 FS	0.08 fl oz / cwt	Seed	333.6	0.1
ST-Methyl 540 FS + Spirato 480 FS	0.35 fl oz / cwt + 0.08 fl oz / cwt	Seed	371.6	0.0
ST-Methyl 540 FS + Spirato 480 FS	0.5 fl oz / cwt + 0.08 fl oz / cwt	Seed	387.8	0.4
ST-Methyl 540 FS + Spirato 480 FS	0.7 fl oz / cwt + 0.08 fl oz / cwt	Seed	396.6	1.3
Maxim 4 FS	0.08 fl oz / cwt	Seed	341.4	0.4
Quadris	9.0 fl oz / a	In-furrow	355.7	1.2
Maxim 4 FS	0.08 fl oz / cwt	Seed	384.4	0.9
Quadris	9.0 fl oz / a	In-furrow	384.4	0.9
Moncut	12.0 oz / a	In-furrow	441.1	1.7
Moncoat MZ	1.0 lb / cwt	Seed	400.0	0.4
Maxim MZ	0.5 lb / cwt	Seed	401.1	0.3
Moncut	0.79 oz / 1000 row ft	In-furrow	434.7	0.0
6% Mancozeb	1.0 lb / cwt	Seed	420.0	0.5
LSD $p>0.05$			50.57	0.96

Compared to the non treated control

NS

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Table 5. Evaluation of biofungicide at planting treatments for Rhizoctonia control at Inkster 45 DAP(2800)

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Treatment	Rate	Application	Stem with Rhizoc	Stem Girdled	Stolon with Rhizoc	Stolon Girdled	Vigor	Decay
Non-treated	-	-	91.4	38.1	43.7	26.9	2.6	39.3
Regalia Regalia	1.0 qt / cwt 2.0 qt / a	Seed In-furrow	88.0	40.3	41.9	22.3	2.4	39.5
Regalia Regalia	2.0 qt / cwt 2.0 qt / a	Seed In-furrow	76.1	13.9	22.8	10.1	6.0	53.6
Regalia Quadris	2.0 qt / cwt 0.6 fl oz / 1000 row ft	Seed In-furrow	84.8	39.2	29.5	5.0	2.4	58.8
Regalia + Quadris	2.0 qt / a + 0.6 fl oz / 1000 row ft	In-furrow	80.8	15.5	29.6	5.6	2.4	64.3
Regalia + Quadris	2.0 qt / a 1.0 fl oz / 1000 row ft	In-furrow						
Regalia + Quadris	2.0 qt / a 0.6 fl oz / 1000 row ft	Hooking	69.3	23.1	25.6	11.4	2.4	54.8
Regalia + Quadris	2.0 qt / a 1.0 fl oz / 1000 row ft	Early Rosette						
Emesto Silver + Newbark Mancozeb Admire Pro	0.31 fl oz / cwt + 16.0 oz / cwt 8.7 fl oz / a	Seed Seed In-furrow	62.0	9.6	24.3	8.5	2.5	17.5
Emesto Silver + Newbark Mancozeb Serenade Soil + Admire Pro	0.31 fl oz / cwt + 16.0 oz / cwt 4.0 qt / a + 8.7 fl oz / a	Seed Seed In-furrow In-furrow	56.8	12.1	17.3	5.3	2.1	18.0
Emesto Silver + Newbark Mancozeb Serenade Soil + Emesto Prime + Admire Pro	0.31 fl oz / cwt + 16.0 oz / cwt 4.0 qt / a + 0.4 fl oz / 1000 row ft + 8.7 fl oz / a	Seed Seed In-furrow In-furrow In-furrow	69.3	18.5	26.5	9.4	2.2	39.3
Emesto Silver + Newbark Mancozeb Serenade Soil + Admire Pro	0.31 fl oz / cwt + 16.0 oz / cwt 2.0 qt / a + 8.7 fl oz / a	Seed Seed In-furrow In-furrow	73.6	13.4	26.2	8.0	2.5	45.3
Emesto Silver + Newbark Mancozeb Serenade Soil + Emesto Prime + Admire Pro	0.31 fl oz / cwt + 16.0 oz / cwt 2.0 qt / a + 0.4 fl oz / 1000 row ft + 8.7 fl oz / a	Seed Seed In-furrow In-furrow In-furrow	47.4	3.3	14.1	4.6	2.4	34.3
Emesto Silver + Newbark Mancozeb Serenade Soil + BCS-AR83685 + Admire Pro	0.31 fl oz / cwt + 16.0 oz / cwt 2.0 qt / a + 8.55 fl oz / a + 8.7 fl oz / a	Seed Seed In-furrow In-furrow In-furrow	72.1	23.7	26.2	8.3	2.4	50.0
Double Nickel LC	1.0 qt / a	In-furrow	80.0	42.0	33.1	11.1	2.4	36.5
Double Nickel LC	2.0 qt / a	In-furrow	87.5	19.8	24.2	10.1	2.4	44.5
Maxim MZ	8 oz / cwt	Seed	69.2	11.4	23.2	11.3	2.4	35.5
Quadris	0.6 fl oz / 1000 row ft	In-furrow	60.5	18.7	17.9	7.2	2.5	35.8
Maxim MZ Quadris	8 oz / cwt 0.6 fl oz / 1000 row ft	Seed In-furrow	84.1	17.3	21.0	4.8	2.4	46.0
Moncut	0.79 oz / 1000 row ft	In-furrow	69.2	24.2	27.2	17.3	2.1	49.5
LSD <sub>p&gt;0.05</sub>			18.25	18.93	17.97	13.49	NS	25.54

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Table 6. Evaluation of biofungicide at planting treatments for yield, marketable and post harvest *Rhizoctonia* control at Inkster 2012 (2800)

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Treatment	Rate	Application	cwt/a	% Rhizoctonia	Total Marketable > 40z ( %)
Non-treated	-	-	350.5	1.5	84.2
Regalia Regalia	1.0 qt / cwt 2.0 qt / a	Seed In-furrow	331.7	0.6	88.4
Regalia Regalia	2.0 qt / cwt 2.0 qt / a	Seed In-furrow	337.3	0.5	87.8
Regalia Quadris	2.0 qt / cwt 0.6 fl oz / 1000 row ft	Seed In-furrow	330.3	0.6	87.7
Regalia + Quadris	2.0 qt / a + 0.6 fl oz / 1000 row ft	In-furrow	312.4	0.4	87.6
Regalia + Quadris	2.0 qt / a 1.0 fl oz / 1000 row ft	In-furrow			
Regalia + Quadris	2.0 qt / a 0.6 fl oz / 1000 row ft	Hooking	313.4	0.7	85.4
Regalia + Quadris	2.0 qt / a 1.0 fl oz / 1000 row ft	Early Rosette			
Emesto Silver + Newbark Mancozeb Admire Pro	0.31 fl oz / cwt + 16.0 oz / cwt 8.7 fl oz / a	Seed Seed In-furrow	336.5	0.6	78.9
Emesto Silver + Newbark Mancozeb Serenade Soil + Admire Pro	0.31 fl oz / cwt + 16.0 oz / cwt 4.0 qt / a + 8.7 fl oz / a	Seed Seed In-furrow In-furrow	352.4	0.8	84.2
Emesto Silver + Newbark Mancozeb Serenade Soil + Emesto Prime + Admire Pro	0.31 fl oz / cwt + 16.0 oz / cwt 4.0 qt / a + 0.4 fl oz / 1000 row ft + 8.7 fl oz / a	Seed Seed In-furrow In-furrow In-furrow	342.6	0.4	87.5
Emesto Silver + Newbark Mancozeb Serenade Soil + Admire Pro	0.31 fl oz / cwt + 16.0 oz / cwt 2.0 qt / a + 8.7 fl oz / a	Seed Seed In-furrow In-furrow	325.1	1.3	81.5
Emesto Silver + Newbark Mancozeb Serenade Soil + Emesto Prime + Admire Pro	0.31 fl oz / cwt + 16.0 oz / cwt 2.0 qt / a + 0.4 fl oz / 1000 row ft + 8.7 fl oz / a	Seed Seed In-furrow In-furrow In-furrow	365.8	2.2	83.6
Emesto Silver + Newbark Mancozeb Serenade Soil + BCS-AR83685 + Admire Pro	0.31 fl oz / cwt + 16.0 oz / cwt 2.0 qt / a + 8.55 fl oz / a + 8.7 fl oz / a	Seed Seed In-furrow In-furrow In-furrow	355.1	0.4	86.6
Double Nickel LC	1.0 qt / a	In-furrow	334.5	2.1	87.5
Double Nickel LC	2.0 qt / a	In-furrow	326.4	1.7	88.9
Maxim MZ	8 oz / cwt	Seed	317.2	1.1	88.2
Quadris	0.6 fl oz / 1000 row ft	In-furrow	309.9	0.2	89.1
Maxim MZ Quadris	8 oz / cwt 0.6 fl oz / 1000 row ft	Seed In-furrow	334.0	0.5	84.2
Moncut	0.79 oz / 1000 row ft	In-furrow	348.5	0.5	85.4
LSD <sub>P&gt;0.05</sub>			NS	0.80	



# This Year

- ∞ Repeat blemish fungicide trial in Becker
  - ∞ Confirm if black dot main blemish disease
  - ∞ Evaluate fungicides for tuber black dot suppression
  - ∞ Blemish samples in back of the room
- ∞ Continue seed treatment and in-furrow trials at Inkster for processing potatoes
  - ∞ Rhizoctonia can result in quality and grade reductions

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