

**POTATO** (*Solanum tuberosum* ‘Russet Burbank’)  
**Blackleg and bacterial soft rot;** *Pectobacterium carotovorum*  
subsp. *atrosepticum*, *P. carotovorum* subsp. *carotovorum*  
Rhizoctonia canker and black scurf; *Rhizoctonia solani*

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### **Evaluation of the efficacy of in-furrow treatments for potato disease control, 2007.**

A trial was initiated 23 Apr at the Hancock Agricultural Research Station in central WI to evaluate the effects of treatments applied in furrow at planting on Rhizoctonia stem canker and tuber infection, and on plant stand, vigor and yield. US#1 Russet Burbank tubers were mechanically cut on 19 Apr into approximately 2 oz seedpieces and seedpieces were allowed to heal before planting. Plots consisted of two 25-ft-long rows spaced 36-in. apart with tubers at 12-in. spacing in the row and a randomized complete block design with four replications was used for the trial. Approximately 4cc of *Rhizoctonia solani* inoculum grown in a sand cornmeal medium was sprinkled over each seedpiece after placement in the furrow. In-furrow chemical treatments were applied in an 8-in.-wide band over the seedpieces in the open furrow at a rate equivalent to 4.0 gal/1000 row ft at 40 psi, using a hand-held boom with a single HC-2 70° hollow disc cone nozzle. After inoculation and treatment, all seedpieces were mechanically covered using hilling disks. The soil type was Plainfield loamy sand, with pH 7.2. Fertilizer applied was: 0-0-60, 300 lb/A, broadcast 3 Apr; 6-24-24, 550 lb/A, banded in the row at planting; and sidedress applications on 9 May (21-0-0, 350 lb/A), 31 May (46-0-0, 225 lb/A) and 30 May (Cal-Sul, 550 lb/A). Insects were controlled with Admire 2F incorporated in the fertilizer at planting (16 fl oz/500 lb) and foliar application of Spintor 2SC (6.0 fl oz/A) 18 Jun and Agrimek 0.15EC (12.0 fl oz/A) 29 Jun. Lorox DF (1.0 lb/A) 7 May was applied for weed control. Fungicide applications to control foliar blight consisted of Tanos (6 oz) + Manzate ProStick (1.5 lb) alternated with Manzate ProStick (1.5 lb) during the growing season. On 28 Jun, the height of each plant in one row of each plot was measured, and plants from 5 ft of each treatment row (10 ft/plot) were dug by hand. Plants were rated for seedpiece decay and symptoms of Rhizoctonia canker and black leg on stems. The number of stems per plant, fresh weight of leaves and stems, and weight and number of daughter tubers were recorded. The remaining portion of each plot (40 ft of row) was left to mature and provide yield data. Vines were killed with applications of Reglone (1.0 pt/A) + NIS (0.5 pt/A) 13 Aug and 17 Aug. The two center rows of each plot were machine harvested and graded 31 Aug. Tubers were graded into US#1, undersize, and cull categories, and all potatoes in the US#1 category from each plot were sorted using an optical size grader into six categories: < 4 oz, 4-6 oz, 6-10 oz, 10-13 oz, 13-16 oz and >16 oz. Specific gravity was determined for a tuber sample from each plot and an approximately 40 pound sample from each plot was placed in storage to be evaluated after 5-6 months for development of Rhizoctonia on the tubers. Rainfall recorded during the growing season (in.) was: 24-30 Apr (1.7); May (3.0); Jun (1.1); Jul (2.5); Aug (7.9); 1-16 Sep (1.0). An additional 15.3 in. of water was applied as overhead sprinkler irrigation in 32 applications (23 May – 16 Aug).

This trial focused on the evaluation of in-furrow treatments to improve control of Rhizoctonia canker, black scurf and silver scurf. Treatment did not affect emergence, final stand, seedpiece decay or black leg. There were small numerical differences in the severity of Rhizoctonia canker, but these differences were not significant at the 5% level. Treatment had no effect on stem numbers or any of the yield parameters measured in this experiment.

**Table 1. Effect of treatment on disease symptoms and plant growth.**

Treatment Chemical	Rate		% of plants emerged on:		Avg. days to emergence	% decay <sup>1</sup>	% plants with black leg	% of total stems with black leg	Rhizoctonia severity (%) <sup>2</sup>	Avg. no. of stems / plant	Avg. fresh weight per plot (lb) <sup>3</sup>			Avg. no. daughter tubers/hill
	a.i. / 1000 ft spacing)	Product /A (36" row spacing)	18 May	22 May							Leaves + stems	Daughter tubers	3	
1 Untreated			99	100	25.7	62.0	0	0	4.8	3.3	17.0	8.4	13.1	
2 LEM17 EC (200 G/L)	0.14 oz	9.6 fl oz	98	100	25.5	53.0	0	0	3.1	3.1	17.7	8.6	13.1	
3 LEM17 EC (200 G/L)	0.34 oz	24 fl oz	99	100	26.1	44.5	0	0	2.3	2.8	16.7	8.4	11.9	
4 LEM17 EC (200 G/L)	0.68 oz	48 fl oz	99	100	25.2	44.2	0	0	3.7	2.9	17.1	7.8	12.5	
5 LEM17 SC (200 G/L)	0.14 oz	9.6 fl oz	96	100	25.5	39.9	0	0	2.6	3.0	18.7	8.4	12.5	
6 LEM17 SC (200 G/L)	0.34 oz	24 fl oz	95	100	25.4	52.2	0	0	2.8	3.1	15.7	7.4	12.1	
7 LEM17 SC (200 G/L)	0.68 oz	48 fl oz	98	100	25.4	44.5	0	0	2.9	2.8	16.3	8.8	12.9	
8 QUADRIS (2.08SC)	0.1 oz	5.8 fl oz	94	100	25.9	40.4	0	0	4.4	3.2	17.5	8.0	12.7	
P>F <sup>4</sup>			0.24	---	0.01	0.64	---	---	0.42	0.27	0.68	0.16	0.92	
LSD <sup>4</sup>			NS	---	0.5	NS	---	---	NS	NS	NS	NS	NS	

1. Severity of seedpiece decay rated on a Horsfall-Barratt scale of 0 (no decay) to 11 (100% decay). Ratings were converted to percentages.

2. Severity rated on a Horsfall-Barratt scale of 0 (no symptoms) to 11 (death of all stems due to Rhizoctonia infection). Ratings were converted to %.

3. All daughter tubers > 0.75-in.-diam were removed and weighed. Remains of seedpieces were also removed. Fresh weight was taken of all remaining plant tissue.

4. Analysis of variance was performed on data, and Fisher's protected least significant difference (LSD) was calculated (alpha=0.05). NS = not significant at P = 0.05.

**Table 2. Effect of treatment on yield and grade of potatoes (Treatment numbers as listed in Table 1).**

Trt no.	Total cwt/A		US#1		Yield		Undersize <sup>1</sup>		Culls		Specific gravity	No. of rotted tubers <sup>2</sup>	Size grades of US#1 potatoes - %					
	cwt/A	%	cwt/A	%	cwt/A	%	cwt/A	%	cwt/A	%			< 4 oz	4-6 oz	6-10 oz	10-13 oz	6-13 oz	13-16 oz
1	425.7	351.7	82.6	54.0	12.7	20.0	4.6	1.080	1.5	28.1	36.5	28.0	6.0	34.0	0.8	0.6	0.6	0.6
2	466.3	390.1	83.6	50.5	10.9	25.6	5.5	1.080	1.8	34.4	36.0	24.4	4.5	28.9	0.6	0.0	0.0	0.0
3	428.1	363.5	84.9	49.9	11.6	14.7	3.5	1.080	0.8	35.2	37.7	22.2	4.0	26.2	0.9	0.0	0.0	0.0
4	434.2	360.6	82.9	52.6	12.1	21.1	4.9	1.080	3.3	33.5	43.3	21.5	1.5	23.0	0.2	0.0	0.0	0.0
5	441.0	375.5	85.2	48.1	10.9	17.3	3.9	1.081	1.8	35.9	37.6	24.6	1.5	26.1	0.4	0.0	0.0	0.0
6	429.7	363.7	84.7	50.0	11.6	16.0	3.6	1.080	1.5	36.5	37.5	23.7	1.1	24.8	0.8	0.3	0.3	0.3
7	455.5	380.5	83.4	60.4	13.4	14.6	3.2	1.081	1.5	37.2	39.4	20.5	2.7	23.2	0.2	0.0	0.0	0.0
8	452.3	375.0	82.7	56.6	12.8	20.6	4.5	1.080	2.8	33.3	37.9	24.9	3.7	28.6	0.2	0.0	0.0	0.0
P>F <sup>3</sup>	0.58	0.78	0.64	0.64	0.65	0.22	0.30	0.95	0.64	0.26	0.56	0.60	0.20	0.46	0.82	0.55	0.55	0.55
LSD	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

1. Undersize indicates potatoes < 1 7/8" in diameter.

2. The average number of tubers per treatment with any kind of rot observed during grading.

3. Analysis of variance was performed on data, and Fisher's protected least significant difference (LSD) was calculated (alpha=0.05). NS = not significant at P = 0.05.