

**POTATO (*Solanum tuberosum* ‘Dark Red Norland’)  
In-Furrow Fungicide Evaluation**

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**THE EFFECT OF IN-FURROW QUADRIS APPLICATION ON DISEASE CONTROL AND POTATO QUALITY - ENDEAVOR, 2000:** A field trial was established May 22 at Gumz Muck Farms, LLC in central WI to evaluate the effect of Quadris fungicide applied in the furrow at planting on seedpiece decay, Rhizoctonia stem canker and effect on plant stand, vigor, yield and tuber quality. Cut potato seedpieces supplied by the grower (approximately 2 oz.) were planted with an assist-feed planter with the covering disks removed. In-furrow treatments were applied in an 8-inch-wide band over the seedpieces at a rate equivalent to 29 gal water/A at 40 psi, using a hand-held boom with a single HC-2 70° hollow disc cone nozzle. After treatment, all seedpieces were mechanically covered using hilling disks. The soil type was Houghton Muck. At planting, air temperature was 70 F with cloudy skies, the soil was slightly moist with a temperature of 71 F. The experiment was designed as a randomized complete block with four replications, each plot consisting of two 20-foot-long rows spaced 36 inches apart with tubers 12 inches apart in the row. Fertilizer included: Potash, 200 lb/A broadcast preplant and 6-24-24, 450 lb/A, banded in the row at planting. Plants were treated during the season by the grower, according to standard grower practice (see Table 1).

On August 7 the total number of plants in each plot was recorded and then eight feet of row from each plot (four feet from each of two rows) was dug by hand. The height of each plant was recorded and plants were rated for Rhizoctonia, black leg and seedpiece decay. 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 (a total of 32 feet of row) was left to mature and provide yield data. Plots were machine harvested on October 10. Tubers were graded into US#1, undersize, and cull categories. US#1 tubers from all plots 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. Rainfall measured during the growing season at the farm (inches) was 4.9 - May; 7.3 - June; 2.5 - July; 5.2 - August and 4.8 - September.

Abundant rainfall during the early part of the growing season contributed to very wet soils. In spite of excessive moisture, the plot exhibited excellent emergence and plant vigor. The application of Quadris Flowable Fungicide in the furrow at planting did not affect emergence, the incidence of blackleg, stem numbers or the average fresh weight of leaves, stems or daughter tubers on the August 7 rating. The Quadris application did reduce the incidence of Rhizoctonia stem canker. Yields were considered average for the time of planting and the environmental conditions during the growing season. Treatment with Quadris did not affect total yield or components of yield. At harvest, we did not note differences in tuber skinning between the Quadris treated and untreated plots.

**Table 1. Pesticide Record for 2000 Potato Crop (Field 53)**

Date	Material	Formulation	Rate/A
6/9	Sevin	80S	1 lb
6/23	Sevin Manzate	80S 200	1 lb 1.5 lb
6/30	Bravo Baythroid Butacide	Ultrex 2 8 EC	1 lb 2.8 oz 8 oz
7/7	Quadris MnSO <sub>4</sub> Manzate	  200	6.2 oz 1.25 lb 1.25 lb
7/8	Spintor		4 oz
7/13	Bravo MnSO <sub>4</sub> Dimethoate Kocide	Ultrex	1.25 lb 1.1 lb 10 oz 1.1 lb
7/17	Matrix Crop Oil Conc AMS		1.5 oz 1 gal/100 gal 2.5 lb

Date	Material	Formulation	Rate/A
7/21	Bravo Kocide	Ultrex	1.25 lb .9 lb
7/28	Bravo Manzate Dimethoate	Ultrex 200	1.1 lb 1 lb 1 qt
8/11	Bravo Kocide 2, 4-D	Ultrex ester	1.2 lb .65 lb 2 oz
8/19	Bravo Dithane Kocide 2, 4-D	Ultrex ester	0.56 lb 1.3 lb .6 lb 2 oz
8/25	Gramoxone R-11		1 pt 1 qt/100 gal

**Table 2. Effect of potato seedpiece treatment on emergence, decay, black leg and Rhizoctonia symptoms and plant development.**

Treatment	Final % emergence <sup>1</sup>	Avg. height/ plant (cm) <sup>2</sup>	% decay <sup>3</sup>	% of plants with black leg	% of total stems with black leg	% Rhizoctonia infection <sup>4</sup>	No. of stems per plant	Avg. fresh weight per hill (g)		Avg. no. of tubers per hill
								Leaves + stems	Daughter tubers	
No treatment at planting	65.9	86.7	100.0	3.1	0.9	7.7	3.9	710.9	668.3	8.0
Quadris applied in-furrow at planting, 0.9586 fl oz./1000 rft	70.3	87.2	100.0	1.6	0.3	2.9	3.8	697.1	586.1	7.5
Pr > F <sup>5</sup>	0.25	0.88	---	0.35	0.38	0.10	0.87	0.82	0.42	0.55
LSD	NS	NS	---	NS	NS	6.0*	NS	NS	NS	NS

1. Based on 40 seedpieces planted/40 feet of row.
2. Avg. height per plant was calculated only for those plants which grew.
3. Severity of seedpiece decay rated on a Horsfall-Barratt scale of 0 (no decay) to 11 (100% decay). Ratings were converted to percentages.
4. Severity rated on a Horsfall-Barratt scale of 0 (no infection) to 11 (death of all stems due to Rhizoctonia infection). Ratings were converted to percentages.
5. Analysis of variance was performed on data, and Fisher's protected least significant difference (LSD) was calculated. NS = not significant at  $P = 0.10$ . \* indicates differences between treatments were significant at  $P = 0.10$ , but not at  $P = 0.05$ .

**Table 3. Effect of seedpiece treatment on yield, proportion of US#1, undersize and culls and size grades.**

Treatment	Total yield cwt/A	US#1		Undersize <sup>1</sup>		Culls		Size grades of US#1 potatoes						
		cwt/A	%	cwt/A	%	cwt/A	%	% < 4 oz.	% 4-6 oz.	% 6-10 oz.	% 10-13 oz.	% 6-13 oz.	% 13-16 oz.	% > 16 oz.
No treatment at planting	352.1	294.4	83.6	17.0	4.8	40.8	11.6	27.4	30.6	30.6	8.1	38.7	2.3	1.0
Quadris applied in-furrow at planting, 0.9586 fl oz./1000 rft	362.2	309.8	85.6	17.6	4.8	34.8	9.5	30.7	29.0	30.7	7.4	38.1	1.3	0.9
Pr > F <sup>2</sup>	0.63	0.35	0.36	0.74	0.93	0.47	0.32	0.28	0.40	0.99	0.58	0.84	0.14	0.94
LSD	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

1. Undersize is defined as potatoes less than 1 7/8 inches in diameter.
2. Analysis of variance was performed on data, and Fisher's protected least significant difference (LSD) calculated. NS = not significant at  $P = 0.10$ . \* indicates differences between treatments were significant at  $P = 0.10$ , but not at  $P = 0.05$ .