

EVALUATION OF FUNGICIDES APPLIED AT PLANTING FOR CONTROL OF RHIZOCTONIA ON POTATO, 2003

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Location: San Luis Valley Research Center, Center, CO
Cultivar: Russet Norkotah selection 8, cut seed, 2-4 oz.
Objective: To evaluate the efficacy of various In-furrow and seed treatments in preventing disease.

Treatments:

1. Control, no treatment
2. Mancozeb @ 0.5 lb./cwt (on seed)
3. Maxim 4 FS @ 0.04 fl.oz./cwt (on seed)
4. Maxim 4 FS @ 0.08 fl.oz./cwt (on seed)
5. Maxim 4 FS @ 0.04 fl.oz./cwt (on seed) + Quadris @ 0.4 fl.oz./1000 row ft. (In-furrow)
6. Maxim 4 FS @ 0.08 fl.oz./cwt (on seed) + Quadris @ 0.4 fl.oz./1000 row ft. (In-furrow)
7. A12534 @ 8 oz./cwt (on seed)
8. Moncoat @ 12 oz./cwt (on seed)
9. Tops MZ 8.5 DS @ 12 oz./cwt (on seed)
10. Quadris 2.08 SC @ 0.4 fl.oz./1000 row ft. (In-furrow)
11. A12534 @ 4 oz./cwt (on seed)
12. A12534 @ 8 oz./cwt (on seed) + Quadris 0.4 fl.oz./1000 row ft. (In-furrow)

Application: In-Furrow treatments were applied using an R & D CO₂ charged backpack sprayer at 35 PSI, with one XR 8002VS nozzle, at 10 gallons/acre as a directed in-furrow application. On seed treatments were applied directly to fresh cut seed and planted within twenty-four hours.

Planted: May 9, 2003
Plot Design: Randomized complete block
Plot Size: 2 - 30 foot rows per treatment per replication
Plant Spacing: 12 inches
Row Spacing: 34 inches
Replications: Four
Irrigation: Solid set sprinkler, rate based on ET
Fertilizer: 80N-60P-40K-25S-2.5Zn, preplant, 10N through sprinkler after tuber set
Herbicide: Matrix, 1.5 oz./A + Eptam, 4.5 pt./A
Insecticide: None
Fungicide: Bravo WS, 1.5 pt./A
Vine Killer: Rotobeat on September 1, 2003
Harvested: September 8, 2003

DATA

Rhizoctonia on seed: Percent tubers infested, 19.7; Mean severity, 24.8; Mean severity equals the mean percent of the affected tuber surface area multiplied by the severity of sclerotia, where 1=small and 3=large sclerotia.

Stand: 2-30 foot rows/treatment/replication, counts taken 42 days after planting.

Seed piece decay: Soft-rot and dry-rot combined rated 0-100, where 0 = no decay and 100 = complete decay; 10 seed pieces/treatment/replication/reading.

Rhizoctonia stem canker: Percent stems infected; 10 plants/treatment/replication/reading.

Blackleg: Percent stems infected; 10 plants/treatment/replication/reading.

Plant vigor: Rated 1-5, where 1 = poor and 5 = good; 10 plants/treatment/replication/reading.

Stems: Average number of stems per plant; 10 plants/treatment/replication/reading.

Tuber set: Average number of tubers per plant at full set; 10 plants/treatment/replication/reading.

Yield: 2-20 foot rows per treatment per replication, total yield expressed in cwt/A.

Grade: By hand, percent tubers by weight in pounds and tuber no. < 4 oz., 4-6 oz., 6-10 oz., > 10 oz., US #2's, and culls.

Black scurf severity index: Mean percent of the affected tuber surface area, 10 8-10 oz. tubers per treatment per replication multiplied by the severity of the sclerotia, where 1= small sclerotia and 3 = large sclerotia.

Table 1. Effects of seed treatments on plant development and incidence of disease in the cultivar Russet Norkotah Selection 8, San Luis Valley, Colorado, 2003

Treatment/Rate ^a	Stand ^b	Vigor ^c		Stems ^d		%Stems with Rhizoctonia ^e		Stolons ^f		%Stolons with Rhizoctonia ^g		Seed piece decay ^h		No. tubers per plant ⁱ	Black scurf severity index ^j
		6/25	7/23	6/25	7/23	6/25	7/23	6/25	7/23	6/25	7/23	6/25	7/23		
1. Control	91.7	3.9	4.7	4.4	4.3a-d	86.1a	73.1ab	19.9	25.0	8.3a	6.6	32.4a	97.6	33.4	10.4
2. Mancozeb @ 0.5 lb./cwt	95.9	3.8	4.7	3.9	3.7cde	76.5ab	73.7a	21.4	23.1	8.2a	6.1	14.1bcd	92.8	28.3	4.0
3. Maxim 4FS @ 0.04 fl.oz./cwt	96.3	4.0	4.7	4.1	4.5abc	61.4bcd	57.9bc	20.8	23.3	3.9b	4.8	7.5cd	94.6	33.1	2.5
4. Maxim 4 FS @ 0.08 fl.oz./cwt	91.7	4.0	4.8	4.3	4.6a	58.9bcd	49.1cd	21.3	23.6	2.0b	2.1	19.1bc	100.0	31.3	1.1
5. Maxim 4 FS @ 0.04 fl.oz./cwt + Quadris @ 0.4 fl.oz./1000 row ft. (IF)	95.8	4.0	4.7	4.2	4.6ab	53.5cd	49.5cd	22.6	26.9	0.8b	2.2	14.6bcd	92.8	34.4	4.8
6. Maxim 4 FS @ 0.08 fl.oz./cwt + Quadris @ 0.4 fl.oz./1000 row ft. (IF)	95.9	3.9	4.9	4.6	4.9a	56.5bcd	44.5cd	23.7	27.0	0.5b	2.0	24.9ab	98.0	33.5	0.0
7. A12534 @ 8 oz./cwt	93.7	3.6	4.8	3.7	3.7cde	66.8a-d	59.7abc	19.2	21.3	3.2b	5.6	4.9d	91.4	30.3	4.5
8. Moncoat @ 12 oz./cwt	95.4	3.7	4.8	3.6	3.5e	54.0cd	41.0d	20.3	21.5	1.8b	1.2	6.9cd	76.9	28.6	0.4
9. Tops MZ 8.5 DS @ 12 oz./cwt	93.3	3.8	4.8	3.9	3.7de	71.8abc	58.7abc	19.1	22.1	2.8b	7.2	2.0d	86.5	30.0	13.3
10. Quadris 2.08 SC @ 0.4 fl.oz./1000 row ft. (IF)	88.3	3.8	4.7	4.5	3.8b-e	54.9cd	47.6cd	22.3	22.4	1.4b	3.8	11.3cd	85.0	30.5	0.6
11. A12534 @ 4 oz./cwt	93.8	3.8	4.7	3.8	3.5e	70.3abc	70.6ab	20.4	21.7	2.3b	11.9	7.9cd	97.0	27.9	12.6
12. A12534 @ 8 oz./cwt + Quadris 0.4 fl.oz./1000 row ft. (IF)	90.0	3.6	4.4	4.0	3.8b-e	47.2d	48.4cd	19.2	23.3	0.6b	2.0	4.3d	86.9	34.1	2.3
LSD(P=0.05)	NS	NS	NS	NS	0.78	20.91	15.73	NS	NS	4.12	NS	13.02	NS	NS	NS

^a All treatments were applied according to the manufacturer's recommendations.

^b Percentage of plants emerged 42 days after planting; four replications.

^c Mean percent vigor, where 1 = poor, 5 = good; 10 plants/treatment/replication/reading.

^d Mean number of stems per seed piece 47 and 75 days after planting; 10 plants/treatment/replication/reading.

^e Mean percent stems with Rhizoctonia canker 47 and 75 days after planting; 10 plants/treatment/replication/reading.

^f Mean number of stolons per seed piece 47 and 75 days after planting; 10 plants/treatment/replication/reading.

^g Mean percent stolons with Rhizoctonia canker 47 and 75 days after planting; 10 plants/treatment/replication/reading.

^h Mean percent incidence of disease combined soft-rot and dry-rot 47 and 75 days after planting; rated 0-100, where 0 = no decay, 100 = complete decay; 10 seed pieces/treatment/replication/reading.

ⁱ Mean number of tubers per plant 75 days after planting; 10 plants/treatment/replication/reading.

^j Mean percent of the affected tuber surface area, 10 8-10 oz. tubers per treatment per replication multiplied by the severity of the sclerotia, where 1 = small sclerotia and 3 = large sclerotia.

Means followed by the same letters are not significantly different at P=0.05.

Table 2. Effects of seed treatments on tuber yield and quality in the cultivar Russet Norkotah Selection 8, San Luis Valley, Colorado, 2003

Treatment/Rate	Percent ^a												Cwt/A ^b
	< 4 oz.	No.	4-6 oz.	No.	6-10 oz.	No.	>10 oz.	No.	US #2s	No.	Culls	No.	
1. Control	7.2	22.2	8.6	13.5	27.2d	28.7	52.9abc	31.1a-d	3.1	3.1	1.1	1.4	438.7
2. Mancozeb @ 0.5 lb./cwt	5.6	17.2	8.9	15.7	29.9bcd	32.2	53.0abc	32.4abc	1.8	1.8	0.8	0.7	438.7
3. Maxim 4FS @ 0.04 fl.oz./cwt	6.5	19.2	10.8	17.0	33.9ab	34.4	44.9de	26.1de	1.8	1.6	2.0	1.6	418.3
4. Maxim 4 FS @ 0.08 fl.oz./cwt	6.2	18.8	11.4	18.2	33.1abc	33.9	46.7cde	26.3de	1.9	1.9	0.8	0.9	425.9
5. Maxim 4 FS @ 0.04 fl.oz./cwt + Quadris @ 0.4 fl.oz./1000 row ft.	6.3	18.0	10.9	17.6	35.5a	35.6	43.3e	25.3e	2.0	2.1	1.9	1.4	455.3
6. Maxim 4 FS @ 0.08 fl.oz./cwt + Quadris @ 0.4 fl.oz./1000 row ft.	5.7	18.0	9.2	15.5	34.5ab	36.1	46.9cde	27.8cde	1.7	1.4	2.0	1.3	454.5
7. A12534 @ 8 oz./cwt	5.7	17.0	8.6	15.4	29.8bcd	32.6	51.7a-d	30.9a-d	2.4	2.6	1.7	1.5	448.2
8. Moncoat @ 12 oz./cwt	4.4	14.0	7.6	13.2	33.0abc	35.8	51.6a-d	33.7ab	2.1	2.2	1.2	1.0	440.7
9. Tops MZ 8.5 DS @ 12 oz./cwt	4.9	16.1	8.6	15.9	28.4cd	31.6	54.2ab	33.1ab	1.8	1.8	2.0	1.6	463.4
10. Quadris 2.08 SC @ 0.4 fl.oz./1000 row ft. (IF)	6.3	19.6	8.4	16.1	29.6bcd	31.1	50.9a-d	28.9b-e	3.0	3.1	1.8	1.3	407.5
11. A12534 @ 4 oz./cwt	6.2	18.9	9.1	15.6	32.2a-d	34.1	48.3b-e	27.6cde	3.3	3.2	0.9	0.7	435.8
12. A12534 @ 8 oz./cwt + Quadris 0.4 fl.oz./1000 row ft. (IF)	4.6	15.3	8.1	15.1	26.9d	30.7	56.2a	35.2a	2.6	2.7	1.6	1.1	407.1
LSD(P=0.05)	NS	NS	NS	NS	5.32	NS	7.06	5.09	NS	NS	NS	NS	NS

^a Based on tuber weight in pounds and tuber number, mean of four replications.

^b Total yield expressed as hundred weight per acre, 2-20 foot rows per treatment per replication, mean of four replications.

Means followed by the same letters are not significantly different at P=0.05.