

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 and seed piece decay.

Treatments:

1. Control, no treatment
2. Moncut SC @ 16.0 fl.oz./A (In-furrow)
3. Moncut 70 DF @ 0.9 lb./A (In-furrow)
4. PCC-3 @ 0.5 lb./cwt (on seed)
5. PCC-4A @ 0.022 lb./cwt (In-furrow) + PCC-4B @ 0.75 lb./cwt (on seed)

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 15, 2003
Plot Design: Randomized complete block
Plot Size: 1 - 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 18, 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: 1-30 foot rows/treatment/replication, counts taken 36 days after planting.

Seed piece decay: Soft-rot and dry-rot combined rated 0-100, where 0 = no decay and 100 = complete decay; 5 seed pieces/treatment/replication/reading.

Rhizoctonia stem canker: Percent stems infected; 5 plants/treatment/replication/reading.

Blackleg: Percent stems infected; 5 plants/treatment/replication/reading.

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

Stems: Average number of stems per plant; 5 plants/treatment/replication/reading.

Tuber set: Average number of tubers per plant at full set; 5 plants/treatment/replication/reading.

Yield: 1-20 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
		6/24	7/16	6/24	7/16	6/24	7/16	6/24	7/16	6/24	7/16				
1. Control, no treatment	98.4	3.5	4.2b	4.0	3.8	83.5	99.0	20.1ab	19.1	6.0	7.9	8.5	93.0a	24.3	13.1
2. Moncut SC @ 16.0 fl.oz./A (IF)	99.2	3.9	4.8a	4.2	4.1	84.1	95.5	22.7a	23.0	4.4	4.1	3.0	89.8a	26.0	7.6
3. Moncut 70 DF @ 0.9 lb./A (IF)	100.0	3.5	4.5ab	4.0	3.5	79.6	99.2	17.3b	19.6	4.9	10.1	0.5	84.0a	31.3	8.5
4. PCC-3 @ 0.5 lb./cwt (on seed)	98.4	3.6	4.7a	3.4	3.8	90.1	90.9	20.3ab	22.0	7.6	2.3	4.3	61.0b	27.8	3.0
5. PCC-4A @ 0.022 lb./cwt (IF) + PCC-4B @ 0.75 lb./cwt (on seed)	98.3	3.8	4.8a	3.9	3.6	85.2	95.4	24.4a	21.3	3.2	4.0	11.3	86.0a	30.8	4.8
LSD(P=0.05)	NS	NS	0.39	NS	NS	NS	NS	4.36	NS	NS	NS	NS	20.50	NS	NS

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

^b Percentage of plants emerged 36 days after planting; four replications.

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

^d Mean number of stems per seed piece 40 and 62 days after planting; 5 plants/treatment/replication/reading.

^e Mean percent stems with Rhizoctonia canker 40 and 62 days after planting; 5 plants/treatment/replication/reading.

^f Mean number of stolons per seed piece 40 and 62 days after planting; 5 plants/treatment/replication/reading.

^g Mean percent stolons with Rhizoctonia canker 40 and 62 days after planting; 5 plants/treatment/replication/reading.

^h Mean percent incidence of disease combined soft-rot and dry-rot 40 and 62 days after planting; rated 0-100, where 0 = no decay, 100 = complete decay; 5 seed pieces/treatment/replication/reading.

ⁱ Mean number of tubers per plant 62 days after planting; 5 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, no treatment	6.6	21.4	10.8	17.7	28.1	29.4	50.1	28.4	1.8	1.4	2.6	1.8	432.3
2. Moncut SC @ 16.0 fl.oz./A (IF)	6.8	20.6	7.1	12.1	29.2	31.7	51.3	30.5	1.8	1.6	3.9	3.6	430.4
3. Moncut 70 DF @ 0.9 lb./A (IF)	8.4	25.7	7.9	12.5	34.0	32.4	44.5	25.4	1.1	1.1	4.2	2.9	444.6
4. PCC-3 @ 0.5 lb./cwt (on seed)	6.0	18.0	8.2	13.8	30.2	32.9	48.8	29.9	0.9	1.0	6.0	4.3	437.5
5. PCC-4A @ 0.022 lb./cwt (IF) + PCC-4B @ 0.75 lb./cwt (on seed)	7.3	19.3	9.9	14.9	36.8	36.7	43.5	27.4	1.1	0.9	1.5	0.8	451.4
LSD(P=0.05)	NS	NS	NS	NS	NS	NS	NS	NS	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, 1-20 foot row per treatment per replication, mean of four replications.