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 seed treatments in preventing disease.

Treatments:
1. Control, no treatment
2. Quadris 2.08 SC @ 6.3 fl.oz./A (In-furrow)
3. Amistar 80WP @ 1.92 oz./A (In-furrow)
4. Moncut 50 WP @ 16.9 oz./A (In-furrow)

Application: In-Furrow treatments were applied using an R & D CO_2 charged backpack sprayer at 35 PSI, with one XR 8002VS nozzle, at 10 gallons/acre as a directed in-furrow application.

Planted: May 13, 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 38 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]
		7/3	7/22	7/3	7/22	7/3	7/22	7/3	7/22	7/3	7/22	7/3	7/22		
1. Control, no treatment	95.4	4.0	4.3	4.4	3.8	94.4	75.3	22.2	18.1	8.6	14.5	55.6	98.8	31.0	6.8
2. Quadris 2.08SC @ 6.3 fl.oz./A (IF)	98.8	4.1	4.5	4.2	4.3	88.1	68.4	24.0	22.5	4.0	4.6	44.3	98.4	32.4	3.3
3. Amistar 80WP @ 1.92 oz./A (IF)	92.9	4.1	4.6	4.1	4.4	92.4	72.0	22.8	22.3	4.7	4.7	43.9	97.5	33.4	3.0
4. Moncut 50 WP @ 16.9 oz./A (IF)	95.4	4.0	4.6	3.9	4.3	94.9	78.3	23.3	22.7	10.3	8.3	39.1	100.0	29.6	2.5
LSD(P=0.05)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

[a] All treatments were applied according to the manufacturer's recommendations.
[b] Percentage of plants emerged 38 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 51 and 70 days after planting; 10 plants/treatment/replication/reading.
[e] Mean percent stems with Rhizoctonia canker 51 and 70 days after planting; 10 plants/treatment/replication/reading.
[f] Mean number of stolons per seed piece 51 and 70 days after planting; 10 plants/treatment/replication/reading.
[g] Mean percent stolons with Rhizoctonia canker 51 and 70 days after planting; 10 plants/treatment/replication/reading.
[h] Mean percent incidence of disease combined soft-rot and dry-rot 51 and 70 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 70 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.

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

	Percent[a]												
Treatment/Rate	< 4 oz.	No.	4-6 oz.	No.	6-10 oz.	No.	>10 oz.	No.	US #2s	No.	Culls	No.	Cwt/A[b]
1. Control, no treatment	7.7	23.3	11.9	18.1	31.9	30.7b	45.6	25.4	1.1	1.0	1.9	1.5	389.5
2. Quadris 2.08SC @ 6.3 fl.oz./A (IF)	8.0	23.5	12.5	17.8	41.0	37.3a	35.7	18.7	1.2	1.2	1.6	1.6	380.0
3. Amistar 80WP @ 1.92 oz./A (IF)	9.2	25.2	13.0	17.9	35.8	32.4ab	38.1	21.1	1.9	1.4	2.0	2.0	373.1
4. Moncut 50 WP @ 16.9 oz./A (IF)	7.3	21.4	9.3	14.2	38.7	37.4a	41.4	23.9	2.1	1.9	1.2	1.2	385.3
LSD(P=0.05)	NS	NS	NS	NS	NS	5.46	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, 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.