

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 CO₂ 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

| 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 | 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.