

2003 POTATO - EARLY BLIGHT FUNGICIDE TRIALS

- Researchers:** Richard T. Zink and Andrew Houser, Colorado State University, SLVRC
- Location:** San Luis Valley Research Center, Center, CO
- Cultivar:** Russet Norkotah Selection 8, cut seed, 2-4 oz.
- Applications:** All treatments applied using an R & D CO₂ charged tractor mounted plot sprayer with four XR 8002VS nozzles spaced seventeen inches apart at 60 psi pressure and applying 40 gallons/acre as a broadcast application.
- Spray Dates:** July 7; July 14; July 21; July 28; August 4; August 11; August 19; August 25
- Planted:** May 7, 2003
- Plot Design:** Randomized complete block
- Plot Size:** 4 - 20 foot rows per treatment per replication, treatments applied to center two rows and data taken on center two rows.
- 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
- Vine Killer:** September 2, 2003
- Harvested:** September 11 & 12, 2003
- DATA:**
- Disease:** Early blight disease incidence based on percent leaves infected, readings taken weekly starting August 6, 2003.
- Yield:** 2-20 foot rows per treatment per replication, total yield expressed as cwt/A.
- Grade:** By hand, percent tubers by weight in pounds < 4 oz., 4-10 oz., > 10 oz., US #2's, and culls.

Summary of Results

Thanks to the generous support of the Colorado Potato Administrative Committee (Area II) and several agricultural companies, full season comprehensive fungicide efficacy trials were conducted this past summer at the San Luis Valley Research Center (see protocol). Over the course of the growing season sixteen different fungicide programs were assessed for early blight control (Table 1). The trials depended on natural infection by early blight (*Alternaria solani*). No late blight (*Phytophthora infestans*) occurred in the trial.

The incidence of early blight within the trials was similar to what occurred in commercial potato production across the San Luis Valley. At the time of final disease readings on September 2, early blight incidence had reached 100 percent in the untreated control. AUDPC values provide clear separation among fungicide programs. Early blight disease development was significantly reduced by all treatments over the untreated control. In general, the highest degree of early blight control was achieved in programs where either Quadris or Headline was utilized (Table 2). Suppression of foliar early blight did not, however, translate directly to increased tuber yields (Table 3).

Table 1. Fungicide programs evaluated for early blight control, San Luis Valley, Colorado 2003

<u>Program</u>	<u>Products</u>	<u>Rate</u>	<u>Itinerary/Week</u>	<u>Est. total cost/A*</u>
1	Control, no treatment	-	-	
2	Polyram	2.0 lb./A	1,5	\$38.76/A
	Headline (F500)	6.2 oz./A	3,7	
3	Quadris	6.2 fl.oz./A	1,3,5,7	\$96.48/A
	Bravo WS	1.25 pt./A	2,4,6,8	
4	Amistar	2.0 oz./A	1,3,5,7	NA
	Bravo WS	1.25 pt./A	2,4,6,8	
5	Quadris/Bravo	1.6 pt./A	1,3,5,7	NA
	Bravo WS	1.25 pt./A	2,4,6,8	
6	Headline (F500)	6.2 oz./A	1,3,5,7	\$85.08/A
	Bravo WS	1.25 pt./A	2,4,6,8	
7	Cuprofix MZ	4.0 lb./A	1	NA
	Penncozeb	2.0 lb./A	2,4,6,7,8	
	Headline (F500)	6.1 oz./A	3,5	
	SuperTin	2.5 oz./A	7,8	
8	Cuprofix MZ	4.0 lb./A	1,2	NA
	Penncozeb	2.0 lb./A	3,5	
	Headline (F500)	6.1 oz./A	4,6	
	SuperTin	2.5 oz./A	7,8	
9	Cuprofix MZ	4.0 lb./A	1	NA
	Penncozeb + Microthiol	2.0 lb./A + 2.0 lb./A	2,4,6	
	Headline (F500)	6.1 oz./A	3,5	
	Penncozeb + SuperTin	2.0 lb./A + 2.5 oz./A	7,8	
10	Cuprofix MZ	4.0 lb./A	1	NA
	Penncozeb + Bond	2.0 lb./A + 4.0 oz./A	2,4,6	
	Headline (F500)	6.1 oz./A	3,5	
	Penncozeb + SuperTin	2.0 lb./A + 2.5 oz./A	7,8	
11	BAS 50000F	6.14 fl.oz./A	1,2,3,4,5,6	\$78.72/A
12	BAS 50000F	9.2 fl.oz./A	1,2,3,4,5,6	\$116.70/A
13	BAS 500 UHF	6.14 fl.oz./A	1,2,3,4,5,6	NA
14	BAS 500 UHF	9.2 fl.oz./A	1,2,3,4,5,6	NA
15	BAS 51004F	2.5 oz./A	1,3,5	NA
	BAS 50000F	6.0 fl.oz./A	2,4	
	SuperTin	2.5 oz./A	6	
16	BAS 51004F	2.5 oz./A	1,3,5	NA
	BAS 50000F	6.0 fl.oz./A	2	
	Acrobat + Polyram	6.4 oz./A + 2.0 lb./A	4	
17	Bravo WS	1.25 pt./A	1,3,5	\$62.53/A
	Quadris	6.2 fl.oz./A	2,4	
	SuperTin	2.5 oz./A	6	

*These prices do not include application costs.

Table 2. Effect of fungicide programs on the incidence of early blight in the cultivar Russet Norkotah Selection 8, San Luis Valley, Colorado, 2003; No Late Blight occurred within the trial.

Treatment	Percent Leaves Infected					AUDPC ^a
	August 6	August 13	August 21	August 27	September 2	
1	14.3	35.0	54.6	98.2	100.0	1057.1 a
2	3.7	7.2	16.5	39.2	96.4	570.3 b
3	3.3	8.0	9.7	27.5	75.5	433.6 d
4	3.4	8.2	9.2	30.9	70.0	425.6 d
5	4.1	6.1	11.7	38.5	60.0	421.5 d
6	3.6	10.4	10.1	30.2	67.9	427.7 d
7	4.5	7.2	13.1	33.8	82.9	495.2 bcd
8	3.6	7.4	8.1	33.8	79.6	463.3 d
9	3.5	6.4	17.0	38.3	93.0	553.7 bc
10	3.2	6.1	16.0	33.6	78.7	481.1 cd
11	5.1	11.8	10.1	31.3	80.4	485.2 cd
12	3.9	6.7	10.1	34.2	67.9	429.2 d
13	3.5	7.1	12.0	38.2	77.5	483.6 cd
14	3.3	6.8	11.7	26.9	72.1	422.5 d
15	3.5	6.0	8.6	32.1	74.6	436.2 d
16	4.0	6.7	9.8	37.1	75.9	467.0 d
17	4.1	10.7	11.1	32.1	81.7	488.9 cd
LSD(P=0.05)	3.28	4.64	6.28	12.44	11.99	78.64

^aAUDPC is the Area Under the Disease Progress Curve.

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

Table 3. Effect of fungicide programs on tuber yield and quality in the cultivar Russet Norkotah Selection 8, San Luis Valley, Colorado, 2003

Treatment	Percent ^a					
	< 4 oz.	4-10 oz.	> 10 oz.	US #2s	Culls	Cwt/A ^b
1	5.3	41.3	57.2	1.9	0.4	399.4
2	6.5	41.6	59.2	1.2	1.2	412.6
3	6.7	40.6	42.3	1.8	1.9	344.8
4	6.4	37.3	55.7	0.4	0.8	382.3
5	7.7	41.3	50.7	1.6	0.6	383.5
6	7.0	39.1	46.2	2.6	0.7	354.8
7	7.9	39.9	54.3	1.6	1.4	392.3
8	6.4	37.7	54.3	4.2	1.8	378.5
9	5.7	36.0	57.8	1.0	0.3	382.9
10	6.0	39.5	55.2	1.9	0.2	387.3
11	7.1	43.9	57.8	2.4	0.8	418.5
12	5.4	35.9	51.0	1.6	1.0	355.1
13	5.7	43.6	60.2	2.1	0.6	421.2
14	4.9	39.8	56.9	1.2	0.7	391.0
15	5.9	43.5	46.3	1.0	0.6	368.3
16	5.0	40.7	53.8	1.6	0.7	382.9
17	6.0	41.0	47.7	1.5	1.3	364.0
LSD(P=0.05)	NS	NS	NS	NS	NS	NS

^a Based on tuber weight in pounds, 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.