

### Evaluation of fungicides for the control of early blight of potato - Hancock, 2008

Potatoes were planted 24 Apr to establish a field trial at the Hancock Agricultural Research Station in central WI to evaluate fungicide efficacy for control of potato foliar blights. Treatments were included for both early and late blight control but once again, no late blight (caused by *Phytophthora infestans*) was observed in Wisconsin during the 2008 growing season. Approximately 2 oz seedpieces were cut mechanically on 17 Apr from US#1 Russet Burbank tubers and the seedpieces were allowed to heal before planting. Treatment plots consisted of four 22-ft-long rows spaced 36 in. apart with 14 in. spacing in the row. A randomized complete block design with four replications was used for the trial. Drive rows for pesticide application equipment were placed adjacent to plots in order to minimize soil compaction and damage to plants in rows used for foliar and yield evaluation. The soil type was Plainfield loamy sand, with pH ranging from 6.2-6.4 across the fields in which the trial was planted. Fertilizer applied was: 0-0-60, 365 lb/A, broadcast 8 Apr; 6-24-24, 550 lb/A, banded in the row at planting; and sidedress applications on 13 May (21-0-0-24S, 350 lb/A) and 3 Jun (Cal-Sul, 500 lb/A + 46-0-0, 315 lb/A). To compensate for nitrogen lost to leaching due to heavy rains in June and July, 28% UAN was applied through the irrigation, 30 lb N/A, on 23 Jun, 8 and 15 Jul. Insects were controlled with Platinum incorporated at a rate equivalent to 8.25 oz/A in the fertilizer applied at planting, and foliar applications of Agri-Mek .15 EC (12.0 fl oz/A) on 26 Jun, Coragen (5.0 fl oz/A) on 18 Jul and Avaunt 30 DG (6.0 oz/A) on 22 Aug. Lorox DF (1.0 lb/A) + NIS 80/20 (1.0 pt/A) 6 May, Sencor DF (0.5 lb/A) 11 Jun and Poast (1.5 pt/A) + Crop Oil Concentrate (2.0 pt/A) 19 Jun were applied for weed control. A growth regulator, Royal MH-30 Xtra (2.0 gal/A) was applied to the foliage 11 Aug to improve tuber shape and uniformity of size. Fungicide treatments were applied weekly to all four rows of each plot from 25 Jun - 20 Aug, according to treatment protocol, for a total of nine applications. Treatments were applied with a plot sprayer consisting of a tractor-mounted boom, pressurized with an air compressor, using Tee Jet Hollow Disc Cone D3-23 nozzles (15 nozzles at 8-in. spacing). Fungicides were applied at a rate equivalent to 35 gal water/A at 40 psi. Plots were not inoculated but relied on natural dispersal of inoculum for disease establishment. Only early blight caused by *Alternaria solani* was observed in the trial. Early blight severity was rated weekly from 17 Jun - 2 Sep using the Horsfall-Barratt rating scale. Applications of Reglone (1.0 pt/A) + NIS 80/20 (1.0 pt/A) were made 3 and 8 Sep to kill vines prior to harvest. On 16 Sep the two center rows of each plot (a total of 44 ft of row) were machine harvested. Tubers were graded 16-18 Sep into US#1, undersize, and cull categories. An optical size grader was used to sort all US#1 potatoes from each treatment plot into six categories: < 4 oz; 4-6 oz; 6-10 oz; 10-13 oz; 13-16 oz and >16 oz and specific gravity was determined for a tuber sample from each plot. Rainfall recorded during the growing season (in.) was: 20-30 Apr (1.55); May (3.25); Jun (6.71); Jul (4.52); Aug (2.4); 1-16 Sep (1.47). An additional 18 in. of water was applied as overhead sprinkler irrigation in 36 applications (1 May - 14 Sep).

The 2008 growing season was characterized by cool and wet growing conditions early in the season and then dry warm conditions from mid season to harvest. Concerns related to excessive rainfall and the potential for nitrogen leaching led to the decision to apply supplemental nitrogen through the irrigation system. This application of N likely contributed to the delayed development of early blight in this trial, but this delay mirrored early blight development in local production fields where similar amounts of supplemental N were applied. The first symptoms of early blight were observed on 17 Jun. Disease severity remained low throughout July, but steadily progressed during August as the crop bulked and matured. By 18 Aug, disease severity in unsprayed plots was 67.2% and by 2 Sep, severity exceeded 96% in these plots. All of the treatment programs provided useful levels of disease control when compared with the unsprayed plots and disease severity was less than 50% in 22 of the 32 treatments on 25 Aug, five days after the final spray. Endura was included in 19 out of 22 of the highest performing treatments and LEM 17 was included in the remaining 3 high performing entries. The Relative AUDPC was less than 0.100 in five treatments, indicating very slow disease progress in these treatment plots over the course of the growing season and excellent season-long disease control. The fungicides Endura or LEM 17 were used in the top 10 treatment programs with the lowest Relative AUDPC values. Differences in disease severity are generally reflected in yield,

tuber sizing, specific gravity and treatment value and this year followed that trend. Total yield, yield of US#1 tubers and specific gravity were lowest in unsprayed plots where early blight progressed most rapidly. Total yield exceeded 600 cwt/a in 16 of the 32 programs and the relative AUDPC was less than 0.100 in four of these high yielding programs. Either Endura or LEM 17 were used at least once in the top 10 programs with the highest total yield and yield of US#1 tubers. The percentage of US#1 tubers was greater than 80% in all fungicide treatment programs and 79% in the untreated plots. The proportion of undersize tuber yield was highest in untreated plots (15.3%) and less than 10% in four treatment programs. The yield of cull potatoes was similar across all treatments. Specific gravity was significantly affected by treatment. The lowest specific gravity (1.078) was observed in the untreated plots with the highest disease severity. A specific gravity of 1.086 or higher was observed in four treatment programs and contributed to the overall crop value in these treatment programs. Endura or LEM 17 fungicides were used in 9 of the 10 programs with the highest specific gravity. Significant differences were observed between treatments in the proportion of tubers in the 10-13 oz category. Five treatment programs had greater than 10% of the US#1 tuber yield in the 10-13 oz category. Fungicide treatment also had a positive effect on fresh market and processing crop values. Compared with the untreated check, treatment during 2008 with registered products increased the crop value for fresh market potatoes from \$1,392 to \$4,020 per acre and for processing tubers \$329 to \$827 per acre. Endura or LEM 17 were used in the top 10 treatment programs having the highest fresh market and processing gross value. We also looked ahead at the proposed price increases for fungicides and calculated the effect of these price increases on fresh market and processing crop values using 2008 crop values and proposed fungicide costs for 2009. Treatment with registered products increased crop values of fresh market potatoes from \$1,359 to \$3484 per acre and the value of processing tubers from \$296 to \$792 per acre. While the treatment values using projected 2009 fungicide costs were somewhat lower than when 2008 fungicide costs were used, this exercise demonstrated the high values derived from treating the potato crop with a well designed and effective fungicide program.

**Table 1. Effect of fungicide treatment on severity of early blight and relative area under the disease progress curve.**

	Treatment Chemicals	Rate/Acre	Schedule Summary <sup>1</sup>	Mean early blight severity (%) <sup>2</sup>											Relative AUDPC <sup>3</sup>
				24-Jun	1-Jul	7-Jul	14-Jul	21-Jul	28-Jul	4-Aug	11-Aug	18-Aug	25-Aug	2-Sep	
1	Untreated			1.2	1.6	2.2	2.5	5.6	6.4	14.1	33.0	67.2	87.7	96.9	0.282
2	Bravo Zn 4:17 F	2.125pt	Weekly	1.0	1.2	1.8	2.0	3.7	3.5	5.7	10.0	38.7	63.3	88.1	0.185
3	Bravo Zn Quadris + Bravo Zn Endura + Bravo Zn Quadris + Bravo Zn	2.12 pt 6 fl oz 1.5 pt 2.5 oz 1.5 pt 6 fl oz 1.8 pt	Appl 1 3 5 7 8 9 Appl 2 Appl 4 Appl 6	0.7	1.5	1.0	2.3	4.1	4.1	4.7	8.3	20.4	40.2	64.5	0.127
4	Bravo Zn Quadris + Bravo Zn Endura + Bravo Zn Quadris + Bravo Zn Dithane DF + Super Tin	2.12 pt 6 fl oz 1.5 pt 2.5 oz 1.5 pt 6 fl oz 1.8 pt 2 lb 2.5 oz	Appl 1 3 5 9 Appl 2 Appl 4 Appl 6 Appl 7 8	0.7	0.9	1.5	2.2	3.2	3.1	4.2	7.3	15.6	27.9	68.6	0.107
5	Echo Zn Headline + Echo Zn Endura + Echo Zn Headline + Echo Zn Dithane DF + Super Tin	2.12 pt 6 fl oz 1.5 pt 2.5 oz 1.5 pt 6 fl oz 1.8 pt 2 lb 2.5 oz	Appl 1 3 5 9 Appl 2 Appl 4 Appl 6 Appl 7 8	0.9	1.0	1.3	2.3	3.9	3.8	5.1	8.2	23.8	47.1	83.3	0.148
6	Echo Zn Endura + Echo Zn Headline + Echo Zn Endura + Echo Zn Dithane DF + Super Tin	2.12 pt 2.5 oz 1.5 pt 6 fl oz 1.5 pt 2.5 oz 1.8 pt 2 lb 2.5 oz	Appl 1 3 5 9 Appl 2 Appl 4 Appl 6 Appl 7 8	0.9	1.0	2.0	2.3	3.4	3.4	4.1	6.4	10.8	27.1	63.3	0.099

	Treatment Chemicals	Rate/Acre	Schedule Summary <sup>1</sup>	Mean early blight severity (%) <sup>2</sup>										Relative AUDPC <sup>3</sup>																	
				24-Jun	1-Jul	7-Jul	14-Jul	21-Jul	28-Jul	4-Aug	11-Aug	18-Aug	25-Aug		2-Sep																
7	Echo Zn Headline + Echo Zn Endura + Echo Zn Headline + Echo Zn Endura + Echo Zn Dithane DF + Super Tin	2.12 pt 6 fl oz 1.5 pt 2.5 oz 1.5 pt 6 fl oz 1.8 pt 2.5 oz 1.8 pt 2 lb 2.5 oz	Appl 1 3 9 Appl 2 Appl 4 Appl 5 Appl 6 Appl 7 8	0.4	1.2	1.0	2.3	3.9	3.7	4.8	6.7	12.9	26.8	68.8	0.105																
				8	Echo Zn Gem 500 SC + Dithane DF Scala 60 SC + Endura + Echo Zn Gem 500 SC + Dithane DF Scala 60 SC + Endura + Echo Zn Gavel 75 DF	2 pt 2.9 fl oz 2 lb 5 fl oz 2.5 oz 2 pt 3.8 fl oz 2 lb 7 fl oz 2.5 oz 2 pt 2 lb	Appl 1 2 8 Appl 3 Appl 4 Appl 5 Appl 6 Appl 7, 9	0.7	0.9	1.6	2.0	3.9	3.7	4.8	7.6	14.9	32.6	68.2	0.114												
								9	Echo Zn Gem 500 SC + Echo Zn Scala 60 SC + Endura + Echo Zn Gem 500 SC + Echo Zn Scala 60 SC + Endura + Echo Zn	2 pt 2.9 fl oz 2.0 pt 5 fl oz 2.5 oz 2 pt 3.8 fl oz 2.0 pt 7 fl oz 2.5 oz 2 pt	Appl 1 2 7 8 9 Appl 3 Appl 4 Appl 5 Appl 6	0.4	1.3	1.8	1.8	3.5	3.5	5.1	6.4	17.4	33.8	72.5	0.118								
												10	Echo Zn Gem 500 SC + Dithane DF Scala 60 SC + Echo Zn Gem 500 SC + Echo Zn Dithane DF	2 pt 2.9 fl oz 1.5 lb 7 fl oz 2 pt 3.8 fl oz 2 pt 4 oz 2 lb	Appl 1 2 9 Appl 3 Appl 4 6 8 Appl 5 Appl 7 Appl 1 3 5 7 9	0.6	1.5	1.6	1.9	3.8	3.4	4.1	5.9	13.2	27.3	66.4	0.103				
																11	JF874 2.1 LB/GAL SE + Manzate 75WG Manzate 75WG	6 fl oz 1.50 lb 2 lb	Appl 2 4 6 8	0.6	1.6	1.8	2.0	3.9	3.9	5.3	9.4	18.7	54.7	80.7	0.151

	Treatment Chemicals	Rate/Acre	Schedule Summary <sup>1</sup>	Mean early blight severity (%) <sup>2</sup>												Relative AUDPC <sup>3</sup>
				24-Jun	1-Jul	7-Jul	14-Jul	21-Jul	28-Jul	4-Aug	11-Aug	18-Aug	25-Aug	2-Sep		
12	QFA61 350 G/L	2.1 pt	Weekly	0.6	0.4	1.0	1.5	3.5	2.5	3.9	5.6	15.8	36.1	75.4	0.116	
13	LEM17 EC 200 G/L Manzate 75WG + JE874 2.1 lb/gal SE	16.8 fl oz 1.50 lb 6 fl oz	Appl 1 3 5 7 9 Appl 2 4 6 8	0.6	1.0	1.9	1.9	3.4	3.2	4.2	5.9	15.5	34.8	74.2	0.117	
14	LEM17 EC 200 G/L Manzate 75WG + JE874 2.1 lb/gal SE	24 fl oz 1.50 lb 6 fl oz	Appl 1 3 5 7 9 Appl 2 4 6 8	0.4	1.0	1.6	2.2	3.9	3.4	4.5	9.7	17.9	46.9	74.8	0.137	
15	LEM17 SC 200 G/L Manzate 75WG + JE874 2.1 lb/gal SE	16.8 fl oz 1.50 lb 6 fl oz	Appl 1 3 5 7 9 Appl 2 4 6 8	0.4	0.9	1.3	2.0	3.5	3.2	4.1	7.3	12.3	27.8	53.3	0.095	
16	Endura 70WG Manzate 75WG + JE874 2.1 lb/gal SE	2.5 oz 1.50 lb 6 fl oz	Appl 1 3 5 7 9 Appl 2 4 6 8	1.0	0.6	1.2	1.9	3.1	2.8	3.5	4.7	8.2	18.7	55.1	0.078	
17	Tanos + Manzate Pro-Stick Endura + Bravo ZN Manzate Pro-Stick + Super-Tin	6.0 oz 1.5 lb 3.5 oz 1.5 pt 1.5 lb 2.5 oz	Appl 1 3 Appl 2 4 Appl 5 6 7 8 9	1.3	0.9	2.0	2.0	3.2	3.1	3.9	6.7	10.5	19.9	55.3	0.086	
18	Nitamin Echo Zn Headline + Echo Zn Endura + Echo Zn Headline + Echo Zn Dithane DF + Super Tin	1 gal 2.12 pt 6 fl oz 1.5 pt 2.5 oz 1.5 pt 6 fl oz 1.8 pt 2 lb 2.5 oz	Appl 5 6 7 8 Appl 1 3 5 9 Appl 2 Appl 4 Appl 6 Appl 7 8	0.3	1.6	1.3	2.2	3.9	3.7	5.3	10.0	26.8	57.0	84.8	0.164	
19	Nitamin Echo Zn Headline + Echo Zn Endura + Echo Zn Headline + Echo Zn Dithane DF + Super Tin	1 gal 2.12 pt 6 fl oz 1.5 pt 2.5 oz 1.5 pt 6 fl oz 1.8 pt 2 lb 2.5 oz	Appl 6 8 Appl 1 3 5 9 Appl 2 Appl 4 Appl 6 Appl 7 8	1.0	1.2	1.3	2.0	3.4	3.5	4.1	5.9	18.2	39.5	77.1	0.126	

	Treatment Chemicals	Rate/Acre	Schedule Summary <sup>1</sup>	Mean early blight severity (%) <sup>2</sup>											Relative AUDPC <sup>3</sup>			
				24-Jun	1-Jul	7-Jul	14-Jul	21-Jul	28-Jul	4-Aug	11-Aug	18-Aug	25-Aug	2-Sep				
20	Nitamin	1 gal	Appl 2 3 4 5															
	Echo Zn	2.12 pt	Appl 1 3 5 9															
	Headline + Echo Zn	6 fl oz	Appl 2															
	Endura	1.5 pt	Appl 4															
	+ Echo Zn	2.5 oz	Appl 6															
	Headline	1.5 pt	Appl 7 8															
	+ Echo Zn	6 fl oz																
	Dithane DF + Super Tin	1.8 pt 2 lb 2.5 oz	0.6	0.9	2.0	1.6	3.4	3.7	4.7	5.9	14.1	34.5	74.0	0.115				
21	Nitamin	1 gal	Appl 2 4															
	Echo Zn	2.12 pt	Appl 1 3 5 9															
	Headline + Echo Zn	6 fl oz	Appl 2															
	Endura	1.5 pt	Appl 4															
	+ Echo Zn	2.5 oz	Appl 6															
	Headline	1.5 pt	Appl 7 8															
	+ Echo Zn	6 fl oz																
	Dithane DF + Super Tin	1.8 pt 2 lb 2.5 oz	0.4	1.2	1.6	2.2	3.5	3.4	4.4	6.4	14.1	39.8	74.8	0.122				
22	Revus Top 4.17 SC + Activator 90 (NIS)	7 fl oz 0.125%/v	Appl 1 2 4 5															
	Bravo Zn 4.17 SC	2.12 pt	Appl 3 6 8															
	Gavel 75 DF	2 lb	Appl 7 9	0.7	1.2	1.3	1.6	3.8	3.1	4.2	7.3	22.1	65.6	88.0	0.165			
	Revus Top 4.17 SC + Activator 90 (NIS)	7 fl oz 0.125%/v	Appl 1 2 4 5															
23	Endura	2.5 oz	Appl 3															
	+ Bravo Zn 4.17 SC	1.5 pt	Appl 6 8															
	Bravo Zn 4.17 SC	2.12 pt	Appl 7 9	1.0	1.2	1.2	1.6	3.1	2.9	3.5	5.9	10.5	31.8	69.5	0.104			
	Gavel 75 DF	2 lb	Appl 1 3 5															
24	AI13703 = Quadris Top + Activator 90 (NIS)	8.4 fl oz 0.125%/v	Appl 1 3 5															
	Bravo Zn 4.17 SC	2.12 pt	Appl 2 4 6 8															
	Gavel 75 DF	2 lb	Appl 7 9	1.5	1.6	1.9	2.2	3.7	3.8	4.5	6.7	18.7	51.6	79.5	0.144			
	Bravo Zn 4.17 SC	2.12 pt	Appl 1 3 5 7 8 9															
25	Quadris (YF10698) + Bravo Zn 4.17 SC	6 fl oz 1.5 pt	Appl 2															
	Endura	2.5 oz	Appl 4															
	+ Bravo Zn 4.17 SC	1.5 pt	Appl 6															
	Revus Top 4.17 SC + Activator 90 (NIS)	7 fl oz 0.125%/v	Appl 1 3 5 7 8 9	1.0	0.7	1.5	2.0	4.2	3.7	4.7	6.7	16.5	29.1	62.1	0.107			

Treatment Chemicals	Rate/Acre	Schedule Summary <sup>1</sup>	Mean early blight severity (%) <sup>2</sup>							Relative AUDPC <sup>3</sup>				
			24-Jun	1-Jul	7-Jul	14-Jul	21-Jul	28-Jul	4-Aug	11-Aug	18-Aug	25-Aug	2-Sep	

26 Bravo Zn 4.17 SC  
 Quadris (YF10698)  
 + Dithane 75 DF  
 Endura  
 + Bravo Zn 4.17 SC  
 + Scala 60 SC  
 Revus Top 4.17 SC  
 24-. Tcpt (TJ03-1.2556 TD00017 Tc00016 TQu6 f3(i)-17(s) oz  
 24- lb0.7( seTJ0F-1.2481 TD00013 1c00025 2(Z)T reoz)00F-1.2556 TD000122Tc000290T(C)5 rept0000008 Tc00016 TQu7 f3(i)-17(s) oz

**Table 2. Effect of fungicide treatment on yield and grade of potatoes (Treatment numbers as listed in Table 1).**

Trt no.	Yield										Specific gravity	Size grades of US#1 potatoes - %					
	US#1		Undersize <sup>1</sup>		Culls		< 4 oz	4-6 oz	6-10 oz	10-13 oz		6-13 oz	13-16 oz	>16 oz			
	cwt/A	%	cwt/A	%	cwt/A	%											
1	507.0	401.4	79.0	76.9	15.3	28.7	5.7	1.078	23.9	33.6	34.8	5.2	40.0	1.8	0.6		
2	598.2	496.2	83.0	70.0	11.7	32.1	5.4	1.083	17.9	31.4	39.1	6.3	45.5	3.9	1.4		
3	588.3	494.0	83.9	63.9	10.9	30.4	5.1	1.086	17.1	29.8	39.8	7.8	47.6	3.8	1.6		
4	620.4	522.3	84.2	63.3	10.2	34.8	5.6	1.084	16.9	30.1	39.2	7.2	46.4	4.1	2.5		
5	605.1	514.6	85.1	65.3	10.8	25.2	4.1	1.083	18.5	31.6	41.9	6.1	48.1	1.4	0.4		
6	634.5	519.4	81.9	65.3	10.3	49.8	7.8	1.085	17.8	27.4	39.2	9.6	48.7	3.2	2.8		
7	596.8	510.6	85.6	62.6	10.4	23.6	4.0	1.085	16.9	32.5	39.6	7.4	47.0	2.8	0.8		
8	588.8	490.3	83.2	62.7	10.6	35.9	6.2	1.085	17.1	28.8	38.6	8.5	47.1	3.5	3.5		
9	595.4	491.0	82.4	80.0	13.4	24.4	4.1	1.086	17.2	30.8	41.7	7.0	48.7	2.7	0.5		
10	600.5	501.0	83.4	58.2	9.7	41.3	6.8	1.083	14.8	27.6	36.7	10.6	47.3	5.7	4.6		
11	552.9	454.3	82.2	70.3	12.8	28.3	5.1	1.084	20.0	30.6	37.5	8.1	45.6	2.4	1.4		
12	582.6	496.8	85.3	52.3	9.0	33.5	5.8	1.085	16.4	31.1	41.6	7.6	49.2	2.3	0.9		
13	601.6	508.7	84.5	66.9	11.2	26.0	4.3	1.085	16.2	30.2	36.9	10.7	47.6	3.9	2.0		
14	603.7	513.7	85.1	60.7	10.0	29.3	4.9	1.084	14.9	30.8	40.1	7.7	47.8	4.6	1.9		
15	594.5	494.2	83.2	73.2	12.2	27.1	4.6	1.088	19.4	30.5	36.2	8.9	45.1	2.6	2.3		
16	627.9	531.4	84.5	61.1	9.8	35.4	5.7	1.086	13.9	27.1	40.6	10.3	50.9	4.8	3.4		
17	638.8	533.6	83.5	70.5	11.0	34.7	5.4	1.085	17.2	31.5	38.9	8.4	47.3	3.3	0.7		
18	592.8	485.0	81.8	79.5	13.5	28.3	4.7	1.081	17.7	28.9	40.9	7.7	48.6	3.2	1.7		
19	564.6	455.4	80.7	74.5	13.2	34.6	6.1	1.085	20.2	33.1	36.6	6.3	42.9	2.5	1.3		
20	590.2	485.8	82.3	75.7	12.9	28.7	4.9	1.085	18.4	28.1	38.7	10.4	49.1	2.9	1.4		
21	608.1	503.9	82.9	66.0	10.9	38.2	6.2	1.084	15.6	30.3	38.8	9.6	48.4	3.8	2.0		
22	574.4	474.5	82.6	62.2	10.9	37.7	6.5	1.083	18.3	34.3	35.5	7.1	42.7	2.8	1.9		
23	619.9	523.5	84.5	69.3	11.1	27.2	4.4	1.085	17.7	30.7	39.2	7.7	46.9	2.8	1.9		
24	568.1	464.0	81.5	74.4	13.1	29.8	5.4	1.083	17.8	29.4	39.0	9.9	48.8	3.3	0.6		
25	601.9	501.3	83.3	65.3	10.9	35.3	5.8	1.085	16.6	27.9	40.1	10.0	50.1	4.0	1.5		
26	624.8	527.4	84.4	64.5	10.5	32.9	5.1	1.085	14.3	26.9	41.4	9.8	51.1	4.7	3.0		
27	607.8	504.9	83.1	61.8	10.2	41.1	6.7	1.085	18.3	31.6	35.8	8.5	44.3	3.7	2.1		
28	629.7	533.0	84.8	57.9	9.2	38.8	6.0	1.085	15.6	32.2	39.0	8.6	47.7	2.9	1.6		
29	585.5	480.3	82.0	75.7	13.0	29.4	5.0	1.085	20.3	31.4	34.5	8.5	42.9	3.3	2.0		
30	597.2	501.1	83.8	69.3	11.7	26.8	4.5	1.082	16.3	30.8	40.2	8.9	49.1	1.4	2.4		
31	601.1	501.1	83.4	71.1	11.8	28.9	4.8	1.081	19.8	32.6	38.7	4.9	43.6	2.4	1.6		
32	603.9	507.7	84.1	68.9	11.4	27.4	4.5	1.083	16.3	28.6	40.9	9.7	50.6	2.3	2.2		
P>F <sup>2</sup>	0.04	0.01	0.25	0.32	0.02	0.22	0.32	<0.01	0.03	0.19	0.39	0.03	0.16	0.22	0.17		
LSD	56.8	55.2	NS	NS	3.1	NS	NS	0.004	4.4	NS	NS	3.4	NS	NS	NS		

1. Undersize indicates potatoes < 1 7/8" in diameter.

2. Analysis of variance was performed on data, and Fisher's protected least significant difference (LSD) was calculated (alpha=0.05). NS = not significant at P = 0.05.



Table 3. Effect of experimental treatment on value per acre. (Treatment numbers as in Table 1)

Trt No.	Gross value of yield (\$/A)		2008 cost of chemicals (\$/A) <sup>3</sup>	Calculations using 2008 chemical prices and 2008 yield value				Anticipated 2009 cost of chemicals (\$/A) <sup>6</sup>	Calculations using anticipated 2009 chemical prices and 2008 yield value			
	Fresh market <sup>1</sup>	Processing <sup>2</sup>		Net value of yield (\$/A) <sup>4</sup>		Effect of treatment on value (\$/A) <sup>5</sup>			Net value of yield (\$/A) <sup>4</sup>		Effect of treatment on value (\$/A) <sup>5</sup>	
				Fresh market <sup>1</sup>	Processing <sup>2</sup>	Fresh market <sup>1</sup>	Processing <sup>2</sup>		Fresh market <sup>1</sup>	Processing <sup>2</sup>	Fresh market <sup>1</sup>	Processing <sup>2</sup>
1	8,483	2,429	0	8,483	2,429	0	0	8,483	2,429	0	0	
2	11,197	3,109	80	11,116	3,029	2,634	80	11,116	3,029	2,634	600	
3	11,308	3,133	109	11,199	3,024	2,716	119	11,189	3,014	2,706	585	
4	11,971	3,309	108	11,864	3,202	3,381	127	11,844	3,182	3,362	754	
5	11,372	3,187	87	11,285	3,100	2,802	116	11,256	3,071	2,773	642	
6	12,039	3,335	85	11,953	3,250	3,471	116	11,922	3,219	3,440	790	
7	11,495	3,192	88	11,407	3,104	2,924	117	11,378	3,075	2,896	647	
8	11,296	3,111	142	11,154	2,969	2,671	172	11,123	2,938	2,641	510	
9	11,146	3,083	133	11,013	2,950	2,530	159	10,988	2,924	2,505	496	
10	12,004	3,202	140	11,863	3,062	3,381	169	11,835	3,033	3,352	605	
11	10,066	2,855	---	---	---	---	---	---	---	---	---	
12	11,315	3,136	---	---	---	---	---	---	---	---	---	
13	11,789	3,223	---	---	---	---	---	---	---	---	---	
14	11,918	3,223	---	---	---	---	---	---	---	---	---	
15	11,042	3,138	---	---	---	---	---	---	---	---	---	
16	12,764	3,409	---	---	---	---	---	---	---	---	---	
17	12,104	3,358	102	12,002	3,256	3,519	137	11,967	3,221	3,484	792	
18	11,102	3,028	119	10,983	2,909	2,500	156	10,946	2,872	2,463	443	
19	9,978	2,861	103	9,875	2,758	1,392	136	9,842	2,725	1,359	296	
20	11,099	3,080	119	10,980	2,961	2,497	156	10,942	2,924	2,460	495	
21	11,764	3,195	103	11,661	3,092	3,178	136	11,628	3,059	3,145	630	
22	10,568	2,971	102	10,466	2,869	1,983	---	---	---	---	---	
23	11,823	3,298	110	11,714	3,189	3,231	---	---	---	---	---	
24	10,596	2,921	---	---	---	---	---	---	---	---	---	
25	11,674	3,195	102	11,571	3,093	3,088	---	---	---	---	---	
26	12,635	3,365	133	12,502	3,232	4,020	---	---	---	---	---	
27	11,373	3,215	145	11,227	3,070	2,745	---	---	---	---	---	
28	12,267	3,383	127	12,139	3,256	3,657	---	---	---	---	---	
29	10,611	3,019	121	10,490	2,898	2,007	---	---	---	---	---	
30	11,510	3,125	36	11,474	3,089	2,992	64	11,446	3,060	2,963	632	
31	10,957	3,088	---	---	---	---	---	---	---	---	---	
32	11,769	3,193	---	---	---	---	---	---	---	---	---	
P > F <sup>7</sup>	< 0.01	< 0.01	---	< 0.01	< 0.01	< 0.01	---	< 0.01	< 0.01	< 0.01	< 0.01	
LSD <sup>7</sup>	1,493	357	---	1,487	341	1,487	---	1,489	330	1,489	330	

- 1 Typical 2008 fresh market pricing: 4-6 oz \$20/cwt, 6-10 oz \$28/cwt, 10-13 oz \$32/cwt, >13 oz \$33/cwt, < 4 oz and culls \$4/cwt.
- 2 Typical 2008 processing contract pricing:
  - Base price is \$.84/cwt for 69% US#1 (4 oz minimum) with specific gravity of 1.078.
  - In the range of 59%-79% US Number 1 shape, there is an increase or decrease of \$.01/cwt for each 1% above or below 69% of the yield. Above 79% there is an increase of \$.015/cwt to a maximum incentive of \$.25/cwt. Below 59% there is a decrease of \$.015/cwt to a maximum penalty of -.25.
  - A premium is paid for > 17% 10 oz or greater. For each 1% above 17% (to a maximum of 36%) > 10 oz the price increases \$.01/cwt. The price decreases \$.01/cwt for each 1% below 17%.
  - There is also an increase/decrease of \$.01/cwt for each 1% above/below 35% >7 oz (to a maximum of 52% >7 oz). There is no further penalty if % > 7 oz is less than 18%.
  - There is an adjustment in price/cwt depending on specific gravity: 1.068 or less, -.20; 1.069 -\$.18; 1.070 -\$.16; 1.071 -\$.14; 1.072 -\$.12; 1.073 -\$.10; 1.074 -\$.08; 1.075 -\$.06; 1.076 -\$.04; 1.077 -\$.02; 1.078 .00; 1.079 +\$.02; 1.080 +\$.04; 1.081 +\$.06; 1.082 +\$.08; 1.083 +\$.10; 1.084 +\$.12; 1.085 +\$.14; 1.086 +\$.16; 1.087 +\$.18; 1.088 or greater +\$.20.
  - There is a payment of \$.20/cwt for processing culls (up to a maximum of 15% of the total by weight).
  - Additional contract adjustments are made for percent bruise free and percent soft rot. We do not have data to calculate these adjustments.
- 3 2008 season-long cost of chemicals/A (rate, number of applications and retail cost are included in calculation). Application costs are not included. Typical retail prices used:
 

Activator, \$10.00/gal	Penncozeb, \$2.50/lb
Bravo Zn, \$33.50/gal	Quadraris 2.08 SC, \$270.00/gal
Dithane DF Rainsield, \$2.50/lb	Quash, \$7.50/oz (estimated)
Echo Zn, \$22.00/gal	Revus Top, \$240.00/gal
Endura, \$4.14/oz	Scala SC, \$1.48/fl oz

  - If ANY component of the treatment was a product with no current retail price, the cost of chemicals was not calculated. Retail price was not available for: JE874, LEM17 EC, LEM17 SC, QFA61, Quadris Top, TD-2368.
- 4 Net value of yield = gross value minus cost of chemicals applied. If price was unavailable for ANY component of the treatment, net value was not calculated.
- 5 Effect of treatment on value = net value for the treatment minus net value of the untreated control.
- 6 Anticipated 2009 season-long cost of chemicals/A (rate, number of applications and retail cost are included in calculation). Application costs are not included. Typical retail prices used:
 

Activator, \$11.00/gal	Manzate Pro-Stick, \$4.50/lb
Bravo Zn, \$33.50/gal	Nitamin, \$10.00/gal
Dithane DF Rainsield, \$4.50/lb	Penncozeb, \$4.50/lb
Echo Zn, \$28.00/gal	Quadraris 2.08 SC, \$330.00/gal

  - If ANY component of the treatment was a product with no current retail price, the cost of chemicals was not calculated. Retail price was not available for: JE874, LEM17 EC, LEM17 SC, QFA61, Quadris Top, TD-2368. In addition, estimated 2009 retail prices were not obtained for Quash, Revus Top or WeatherKing Plus.
- 7 Analysis of variance was performed on data, and Fisher's protected least significant difference (LSD) was calculated (alpha=0.05). NS = not significant at P = 0.05

Table 4. Data ranked according to several disease and yield measurements (Treatments as described in Table 1).

Sorted by Relative AUDPC (increasing)

	Relative AUDPC <sup>1</sup>	Total cwt/A	US#1 cwt/A <sup>2</sup>	% 6-13 oz	Specific gravity	Gross value of yield (\$/A) <sup>3</sup>		Effect of treatment on value (2008 chemical prices) (\$/A) <sup>3</sup>		Effect of treatment on value (anticipated 2009 chemical prices) (\$/A) <sup>3</sup>	
						Fresh market	Processing	Fresh market	Processing	Fresh market	Processing
16	0.078	627.9	531.4	50.9	1.086	12,764	3,409	---	---	---	---
26	0.078	624.8	527.4	51.1	1.085	12,635	3,365	4,020	804	---	---
17	0.086	638.8	533.6	47.3	1.085	12,104	3,358	3,519	827	3,484	792
15	0.095	594.5	494.2	45.1	1.088	11,042	3,138	---	---	---	---
6	0.099	634.5	519.4	48.7	1.085	12,039	3,335	3,471	821	3,440	790
10	0.103	600.5	501.0	47.3	1.083	12,004	3,202	3,381	633	3,352	605
23	0.104	619.9	523.5	46.9	1.085	11,823	3,298	3,231	760	---	---
7	0.105	596.8	510.6	47.0	1.085	11,495	3,192	2,924	676	2,896	647
4	0.107	620.4	522.3	46.4	1.084	11,971	3,309	3,381	773	3,362	754
25	0.107	601.9	501.3	50.1	1.085	11,674	3,195	3,088	664	---	---
27	0.112	607.8	504.9	44.3	1.085	11,373	3,215	2,745	642	---	---
8	0.114	588.8	490.3	47.1	1.085	11,296	3,111	2,671	540	2,641	510
20	0.115	590.2	485.8	49.1	1.085	11,099	3,080	2,497	532	2,460	495
12	0.116	582.6	496.8	49.2	1.085	11,315	3,136	---	---	---	---
13	0.117	601.6	508.7	47.6	1.085	11,789	3,223	---	---	---	---
9	0.118	595.4	491.0	48.7	1.086	11,146	3,083	2,530	521	2,505	496
21	0.122	608.1	503.9	48.4	1.084	11,764	3,195	3,178	663	3,145	630
28	0.123	629.7	533.0	47.7	1.085	12,267	3,383	3,657	827	---	---
19	0.126	564.6	455.4	42.9	1.085	9,978	2,861	1,392	329	1,359	296
3	0.127	588.3	494.0	47.6	1.086	11,308	3,133	2,716	595	2,706	585
14	0.137	603.7	513.7	47.8	1.084	11,918	3,223	---	---	---	---
24	0.144	568.1	464.0	48.8	1.083	10,596	2,921	---	---	---	---
5	0.148	605.1	514.6	48.1	1.083	11,372	3,187	2,802	671	2,773	642
11	0.151	552.9	454.3	45.6	1.084	10,066	2,855	---	---	---	---
29	0.162	585.5	480.3	42.9	1.085	10,611	3,019	2,007	469	---	---
18	0.164	592.8	485.0	48.6	1.081	11,102	3,028	2,500	481	2,463	443
22	0.165	574.4	474.5	42.7	1.083	10,568	2,971	1,983	441	---	---
30	0.170	597.2	501.1	49.1	1.082	11,510	3,125	2,992	660	2,963	632
32	0.178	603.9	507.7	50.6	1.083	11,769	3,193	---	---	---	---
2	0.185	598.2	496.2	45.5	1.083	11,197	3,109	2,634	600	2,634	600
31	0.194	601.1	501.1	43.6	1.081	10,957	3,088	---	---	---	---
1	0.282	507.0	401.4	40.0	1.078	8,483	2,429	0	0	0	0
Pr>F <sup>4</sup>	<0.01	0.04	0.01	0.16	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
LSD	0.041	56.8	55.2	NS	0.004	1,493	357	1,487	341	1,489	330

*Sorted by total yield (decreasing)*

	Relative AUDPC <sup>1</sup>	Total cwt/A	US#1 cwt/A <sup>2</sup>	% 6-13 oz	Specific gravity	Gross value of yield (\$/A) <sup>3</sup>		Effect of treatment on value (2008 chemical prices) (\$/A) <sup>3</sup>		Effect of treatment on value (anticipated 2009 chemical prices) (\$/A) <sup>3</sup>	
						Fresh market	Processing	Fresh market	Processing	Fresh market	Processing
17	0.086	638.8	533.6	47.3	1.085	12,104	3,358	3,519	827	3,484	792
6	0.099	634.5	519.4	48.7	1.085	12,039	3,335	3,471	821	3,440	790
28	0.123	629.7	533.0	47.7	1.085	12,267	3,383	3,657	827	---	---
16	0.078	627.9	531.4	50.9	1.086	12,764	3,409	---	---	---	---
26	0.078	624.8	527.4	51.1	1.085	12,635	3,365	4,020	804	---	---
4	0.107	620.4	522.3	46.4	1.084	11,971	3,309	3,381	773	3,362	754
23	0.104	619.9	523.5	46.9	1.085	11,823	3,298	3,231	760	---	---
21	0.122	608.1	503.9	48.4	1.084	11,764	3,195	3,178	663	3,145	630
27	0.112	607.8	504.9	44.3	1.085	11,373	3,215	2,745	642	---	---
5	0.148	605.1	514.6	48.1	1.083	11,372	3,187	2,802	671	2,773	642
32	0.178	603.9	507.7	50.6	1.083	11,769	3,193	---	---	---	---
14	0.137	603.7	513.7	47.8	1.084	11,918	3,223	---	---	---	---
25	0.107	601.9	501.3	50.1	1.085	11,674	3,195	3,088	664	---	---
13	0.117	601.6	508.7	47.6	1.085	11,789	3,223	---	---	---	---
31	0.194	601.1	501.1	43.6	1.081	10,957	3,088	---	---	---	---
10	0.103	600.5	501.0	47.3	1.083	12,004	3,202	3,381	633	3,352	605
2	0.185	598.2	496.2	45.5	1.083	11,197	3,109	2,634	600	2,634	600
30	0.170	597.2	501.1	49.1	1.082	11,510	3,125	2,992	660	2,963	632
7	0.105	596.8	510.6	47.0	1.085	11,495	3,192	2,924	676	2,896	647
9	0.118	595.4	491.0	48.7	1.086	11,146	3,083	2,530	521	2,505	496
15	0.095	594.5	494.2	45.1	1.088	11,042	3,138	---	---	---	---
18	0.164	592.8	485.0	48.6	1.081	11,102	3,028	2,500	481	2,463	443
20	0.115	590.2	485.8	49.1	1.085	11,099	3,080	2,497	532	2,460	495
8	0.114	588.8	490.3	47.1	1.085	11,296	3,111	2,671	540	2,641	510
3	0.127	588.3	494.0	47.6	1.086	11,308	3,133	2,716	595	2,706	585
29	0.162	585.5	480.3	42.9	1.085	10,611	3,019	2,007	469	---	---
12	0.116	582.6	496.8	49.2	1.085	11,315	3,136	---	---	---	---
22	0.165	574.4	474.5	42.7	1.083	10,568	2,971	1,983	441	---	---
24	0.144	568.1	464.0	48.8	1.083	10,596	2,921	---	---	---	---
19	0.126	564.6	455.4	42.9	1.085	9,978	2,861	1,392	329	1,359	296
11	0.151	552.9	454.3	45.6	1.084	10,066	2,855	---	---	---	---
1	0.282	507.0	401.4	40.0	1.078	8,483	2,429	0	0	0	0
Pr>F <sup>4</sup>	<0.01	0.04	0.01	0.16	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
LSD	0.041	56.8	55.2	NS	0.004	1,493	357	1,487	341	1,489	330

*Sorted by yield US#1 tubers (decreasing)*

	Relative AUDPC <sup>1</sup>	Total cwt/A	US#1 cwt/A <sup>2</sup>	% 6-13 oz	Specific gravity	Gross value of yield (\$/A) <sup>3</sup>		Effect of treatment on value (2008 chemical prices) (\$/A) <sup>3</sup>		Effect of treatment on value (anticipated 2009 chemical prices) (\$/A) <sup>3</sup>	
						Fresh market	Processing	Fresh market	Processing	Fresh market	Processing
17	0.086	638.8	533.6	47.3	1.085	12,104	3,358	3,519	827	3,484	792
28	0.123	629.7	533.0	47.7	1.085	12,267	3,383	3,657	827	---	---
16	0.078	627.9	531.4	50.9	1.086	12,764	3,409	---	---	---	---
26	0.078	624.8	527.4	51.1	1.085	12,635	3,365	4,020	804	---	---
23	0.104	619.9	523.5	46.9	1.085	11,823	3,298	3,231	760	---	---
4	0.107	620.4	522.3	46.4	1.084	11,971	3,309	3,381	773	3,362	754
6	0.099	634.5	519.4	48.7	1.085	12,039	3,335	3,471	821	3,440	790
5	0.148	605.1	514.6	48.1	1.083	11,372	3,187	2,802	671	2,773	642
14	0.137	603.7	513.7	47.8	1.084	11,918	3,223	---	---	---	---
7	0.105	596.8	510.6	47.0	1.085	11,495	3,192	2,924	676	2,896	647
13	0.117	601.6	508.7	47.6	1.085	11,789	3,223	---	---	---	---
32	0.178	603.9	507.7	50.6	1.083	11,769	3,193	---	---	---	---
27	0.112	607.8	504.9	44.3	1.085	11,373	3,215	2,745	642	---	---
21	0.122	608.1	503.9	48.4	1.084	11,764	3,195	3,178	663	3,145	630
25	0.107	601.9	501.3	50.1	1.085	11,674	3,195	3,088	664	---	---
31	0.194	601.1	501.1	43.6	1.081	10,957	3,088	---	---	---	---
30	0.170	597.2	501.1	49.1	1.082	11,510	3,125	2,992	660	2,963	632
10	0.103	600.5	501.0	47.3	1.083	12,004	3,202	3,381	633	3,352	605
12	0.116	582.6	496.8	49.2	1.085	11,315	3,136	---	---	---	---
2	0.185	598.2	496.2	45.5	1.083	11,197	3,109	2,634	600	2,634	600
15	0.095	594.5	494.2	45.1	1.088	11,042	3,138	---	---	---	---
3	0.127	588.3	494.0	47.6	1.086	11,308	3,133	2,716	595	2,706	585
9	0.118	595.4	491.0	48.7	1.086	11,146	3,083	2,530	521	2,505	496
8	0.114	588.8	490.3	47.1	1.085	11,296	3,111	2,671	540	2,641	510
20	0.115	590.2	485.8	49.1	1.085	11,099	3,080	2,497	532	2,460	495
18	0.164	592.8	485.0	48.6	1.081	11,102	3,028	2,500	481	2,463	443
29	0.162	585.5	480.3	42.9	1.085	10,611	3,019	2,007	469	---	---
22	0.165	574.4	474.5	42.7	1.083	10,568	2,971	1,983	441	---	---
24	0.144	568.1	464.0	48.8	1.083	10,596	2,921	---	---	---	---
19	0.126	564.6	455.4	42.9	1.085	9,978	2,861	1,392	329	1,359	296
11	0.151	552.9	454.3	45.6	1.084	10,066	2,855	---	---	---	---
1	0.282	507.0	401.4	40.0	1.078	8,483	2,429	0	0	0	0
Pr>F <sup>4</sup>	<0.01	0.04	0.01	0.16	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
LSD	0.041	56.8	55.2	NS	0.004	1,493	357	1,487	341	1,489	330

Sorted by PERCENTAGE US#1 tubers 6-13 oz (decreasing)

	Relative AUDPC <sup>1</sup>	Total cwt/A	US#1 cwt/A <sup>2</sup>	% 6-13 oz	Specific gravity	Gross value of yield (\$/A) <sup>3</sup>		Effect of treatment on value (2008 chemical prices) (\$/A) <sup>3</sup>		Effect of treatment on value (anticipated 2009 chemical prices) (\$/A) <sup>3</sup>	
						Fresh market	Processing	Fresh market	Processing	Fresh market	Processing
26	0.078	624.8	527.4	51.1	1.085	12,635	3,365	4,020	804	---	---
16	0.078	627.9	531.4	50.9	1.086	12,764	3,409	---	---	---	---
32	0.178	603.9	507.7	50.6	1.083	11,769	3,193	---	---	---	---
25	0.107	601.9	501.3	50.1	1.085	11,674	3,195	3,088	664	---	---
12	0.116	582.6	496.8	49.2	1.085	11,315	3,136	---	---	---	---
30	0.170	597.2	501.1	49.1	1.082	11,510	3,125	2,992	660	2,963	632
20	0.115	590.2	485.8	49.1	1.085	11,099	3,080	2,497	532	2,460	495
24	0.144	568.1	464.0	48.8	1.083	10,596	2,921	---	---	---	---
6	0.099	634.5	519.4	48.7	1.085	12,039	3,335	3,471	821	3,440	790
9	0.118	595.4	491.0	48.7	1.086	11,146	3,083	2,530	521	2,505	496
18	0.164	592.8	485.0	48.6	1.081	11,102	3,028	2,500	481	2,463	443
21	0.122	608.1	503.9	48.4	1.084	11,764	3,195	3,178	663	3,145	630
5	0.148	605.1	514.6	48.1	1.083	11,372	3,187	2,802	671	2,773	642
14	0.137	603.7	513.7	47.8	1.084	11,918	3,223	---	---	---	---
28	0.123	629.7	533.0	47.7	1.085	12,267	3,383	3,657	827	---	---
13	0.117	601.6	508.7	47.6	1.085	11,789	3,223	---	---	---	---
3	0.127	588.3	494.0	47.6	1.086	11,308	3,133	2,716	595	2,706	585
17	0.086	638.8	533.6	47.3	1.085	12,104	3,358	3,519	827	3,484	792
10	0.103	600.5	501.0	47.3	1.083	12,004	3,202	3,381	633	3,352	605
8	0.114	588.8	490.3	47.1	1.085	11,296	3,111	2,671	540	2,641	510
7	0.105	596.8	510.6	47.0	1.085	11,495	3,192	2,924	676	2,896	647
23	0.104	619.9	523.5	46.9	1.085	11,823	3,298	3,231	760	---	---
4	0.107	620.4	522.3	46.4	1.084	11,971	3,309	3,381	773	3,362	754
11	0.151	552.9	454.3	45.6	1.084	10,066	2,855	---	---	---	---
2	0.185	598.2	496.2	45.5	1.083	11,197	3,109	2,634	600	2,634	600
15	0.095	594.5	494.2	45.1	1.088	11,042	3,138	---	---	---	---
27	0.112	607.8	504.9	44.3	1.085	11,373	3,215	2,745	642	---	---
31	0.194	601.1	501.1	43.6	1.081	10,957	3,088	---	---	---	---
29	0.162	585.5	480.3	42.9	1.085	10,611	3,019	2,007	469	---	---
19	0.126	564.6	455.4	42.9	1.085	9,978	2,861	1,392	329	1,359	296
22	0.165	574.4	474.5	42.7	1.083	10,568	2,971	1,983	441	---	---
1	0.282	507.0	401.4	40.0	1.078	8,483	2,429	0	0	0	0
Pr>F <sup>4</sup>	<0.01	0.04	0.01	0.16	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
LSD	0.041	56.8	55.2	NS	0.004	1,493	357	1,487	341	1,489	330

*Sorted by specific gravity (decreasing)*

	Relative AUDPC <sup>1</sup>	Total cwt/A	US#1 cwt/A <sup>2</sup>	% 6-13 oz	Specific gravity	Gross value of yield (\$/A) <sup>3</sup>		Effect of treatment on value (2008 chemical prices) (\$/A) <sup>3</sup>		Effect of treatment on value (anticipated 2009 chemical prices) (\$/A) <sup>3</sup>	
						Fresh market	Processing	Fresh market	Processing	Fresh market	Processing
15	0.095	594.5	494.2	45.1	1.088	11,042	3,138	---	---	---	---
16	0.078	627.9	531.4	50.9	1.086	12,764	3,409	---	---	---	---
9	0.118	595.4	491.0	48.7	1.086	11,146	3,083	2,530	521	2,505	496
3	0.127	588.3	494.0	47.6	1.086	11,308	3,133	2,716	595	2,706	585
26	0.078	624.8	527.4	51.1	1.085	12,635	3,365	4,020	804	---	---
25	0.107	601.9	501.3	50.1	1.085	11,674	3,195	3,088	664	---	---
12	0.116	582.6	496.8	49.2	1.085	11,315	3,136	---	---	---	---
20	0.115	590.2	485.8	49.1	1.085	11,099	3,080	2,497	532	2,460	495
6	0.099	634.5	519.4	48.7	1.085	12,039	3,335	3,471	821	3,440	790
28	0.123	629.7	533.0	47.7	1.085	12,267	3,383	3,657	827	---	---
13	0.117	601.6	508.7	47.6	1.085	11,789	3,223	---	---	---	---
17	0.086	638.8	533.6	47.3	1.085	12,104	3,358	3,519	827	3,484	792
8	0.114	588.8	490.3	47.1	1.085	11,296	3,111	2,671	540	2,641	510
7	0.105	596.8	510.6	47.0	1.085	11,495	3,192	2,924	676	2,896	647
23	0.104	619.9	523.5	46.9	1.085	11,823	3,298	3,231	760	---	---
27	0.112	607.8	504.9	44.3	1.085	11,373	3,215	2,745	642	---	---
29	0.162	585.5	480.3	42.9	1.085	10,611	3,019	2,007	469	---	---
19	0.126	564.6	455.4	42.9	1.085	9,978	2,861	1,392	329	1,359	296
21	0.122	608.1	503.9	48.4	1.084	11,764	3,195	3,178	663	3,145	630
14	0.137	603.7	513.7	47.8	1.084	11,918	3,223	---	---	---	---
4	0.107	620.4	522.3	46.4	1.084	11,971	3,309	3,381	773	3,362	754
11	0.151	552.9	454.3	45.6	1.084	10,066	2,855	---	---	---	---
32	0.178	603.9	507.7	50.6	1.083	11,769	3,193	---	---	---	---
24	0.144	568.1	464.0	48.8	1.083	10,596	2,921	---	---	---	---
5	0.148	605.1	514.6	48.1	1.083	11,372	3,187	2,802	671	2,773	642
10	0.103	600.5	501.0	47.3	1.083	12,004	3,202	3,381	633	3,352	605
2	0.185	598.2	496.2	45.5	1.083	11,197	3,109	2,634	600	2,634	600
22	0.165	574.4	474.5	42.7	1.083	10,568	2,971	1,983	441	---	---
30	0.170	597.2	501.1	49.1	1.082	11,510	3,125	2,992	660	2,963	632
18	0.164	592.8	485.0	48.6	1.081	11,102	3,028	2,500	481	2,463	443
31	0.194	601.1	501.1	43.6	1.081	10,957	3,088	---	---	---	---
1	0.282	507.0	401.4	40.0	1.078	8,483	2,429	0	0	0	0
Pr>F <sup>4</sup>	<0.01	0.04	0.01	0.16	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
LSD	0.041	56.8	55.2	NS	0.004	1,493	357	1,487	341	1,489	330

*Sorted by gross value of yield – fresh market (\$/A, decreasing)*

	Relative AUDPC <sup>1</sup>	Total cwt/A	US#1 cwt/A <sup>2</sup>	% 6-13 oz	Specific gravity	Gross value of yield (\$/A) <sup>3</sup>		Effect of treatment on value (2008 chemical prices) (\$/A) <sup>3</sup>		Effect of treatment on value (anticipated 2009 chemical prices) (\$/A) <sup>3</sup>	
						Fresh market	Processing	Fresh market	Processing	Fresh market	Processing
16	0.078	627.9	531.4	50.9	1.086	12,764	3,409	---	---	---	---
26	0.078	624.8	527.4	51.1	1.085	12,635	3,365	4,020	804	---	---
28	0.123	629.7	533.0	47.7	1.085	12,267	3,383	3,657	827	---	---
17	0.086	638.8	533.6	47.3	1.085	12,104	3,358	3,519	827	3,484	792
6	0.099	634.5	519.4	48.7	1.085	12,039	3,335	3,471	821	3,440	790
10	0.103	600.5	501.0	47.3	1.083	12,004	3,202	3,381	633	3,352	605
4	0.107	620.4	522.3	46.4	1.084	11,971	3,309	3,381	773	3,362	754
14	0.137	603.7	513.7	47.8	1.084	11,918	3,223	---	---	---	---
23	0.104	619.9	523.5	46.9	1.085	11,823	3,298	3,231	760	---	---
13	0.117	601.6	508.7	47.6	1.085	11,789	3,223	---	---	---	---
32	0.178	603.9	507.7	50.6	1.083	11,769	3,193	---	---	---	---
21	0.122	608.1	503.9	48.4	1.084	11,764	3,195	3,178	663	3,145	630
25	0.107	601.9	501.3	50.1	1.085	11,674	3,195	3,088	664	---	---
30	0.170	597.2	501.1	49.1	1.082	11,510	3,125	2,992	660	2,963	632
7	0.105	596.8	510.6	47.0	1.085	11,495	3,192	2,924	676	2,896	647
27	0.112	607.8	504.9	44.3	1.085	11,373	3,215	2,745	642	---	---
5	0.148	605.1	514.6	48.1	1.083	11,372	3,187	2,802	671	2,773	642
12	0.116	582.6	496.8	49.2	1.085	11,315	3,136	---	---	---	---
3	0.127	588.3	494.0	47.6	1.086	11,308	3,133	2,716	595	2,706	585
8	0.114	588.8	490.3	47.1	1.085	11,296	3,111	2,671	540	2,641	510
2	0.185	598.2	496.2	45.5	1.083	11,197	3,109	2,634	600	2,634	600
9	0.118	595.4	491.0	48.7	1.086	11,146	3,083	2,530	521	2,505	496
18	0.164	592.8	485.0	48.6	1.081	11,102	3,028	2,500	481	2,463	443
20	0.115	590.2	485.8	49.1	1.085	11,099	3,080	2,497	532	2,460	495
15	0.095	594.5	494.2	45.1	1.088	11,042	3,138	---	---	---	---
31	0.194	601.1	501.1	43.6	1.081	10,957	3,088	---	---	---	---
29	0.162	585.5	480.3	42.9	1.085	10,611	3,019	2,007	469	---	---
24	0.144	568.1	464.0	48.8	1.083	10,596	2,921	---	---	---	---
22	0.165	574.4	474.5	42.7	1.083	10,568	2,971	1,983	441	---	---
11	0.151	552.9	454.3	45.6	1.084	10,066	2,855	---	---	---	---
19	0.126	564.6	455.4	42.9	1.085	9,978	2,861	1,392	329	1,359	296
1	0.282	507.0	401.4	40.0	1.078	8,483	2,429	0	0	0	0
Pr>F <sup>4</sup>	<0.01	0.04	0.01	0.16	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
LSD	0.041	56.8	55.2	NS	0.004	1,493	357	1,487	341	1,489	330



*Sorted by gross value of yield - processing (\$/A, decreasing)*

	Relative AUDPC <sup>1</sup>	Total cwt/A	US#1 cwt/A <sup>2</sup>	% 6-13 oz	Specific gravity	Gross value of yield (\$/A) <sup>3</sup>		Effect of treatment on value (2008 chemical prices) (\$/A) <sup>3</sup>		Effect of treatment on value (anticipated 2009 chemical prices) (\$/A) <sup>3</sup>	
						Fresh market	Processing	Fresh market	Processing	Fresh market	Processing
16	0.078	627.9	531.4	50.9	1.086	12,764	3,409	---	---	---	---
28	0.123	629.7	533.0	47.7	1.085	12,267	3,383	3,657	827	---	---
26	0.078	624.8	527.4	51.1	1.085	12,635	3,365	4,020	804	---	---
17	0.086	638.8	533.6	47.3	1.085	12,104	3,358	3,519	827	3,484	792
6	0.099	634.5	519.4	48.7	1.085	12,039	3,335	3,471	821	3,440	790
4	0.107	620.4	522.3	46.4	1.084	11,971	3,309	3,381	773	3,362	754
23	0.104	619.9	523.5	46.9	1.085	11,823	3,298	3,231	760	---	---
14	0.137	603.7	513.7	47.8	1.084	11,918	3,223	---	---	---	---
13	0.117	601.6	508.7	47.6	1.085	11,789	3,223	---	---	---	---
27	0.112	607.8	504.9	44.3	1.085	11,373	3,215	2,745	642	---	---
10	0.103	600.5	501.0	47.3	1.083	12,004	3,202	3,381	633	3,352	605
21	0.122	608.1	503.9	48.4	1.084	11,764	3,195	3,178	663	3,145	630
25	0.107	601.9	501.3	50.1	1.085	11,674	3,195	3,088	664	---	---
32	0.178	603.9	507.7	50.6	1.083	11,769	3,193	---	---	---	---
7	0.105	596.8	510.6	47.0	1.085	11,495	3,192	2,924	676	2,896	647
5	0.148	605.1	514.6	48.1	1.083	11,372	3,187	2,802	671	2,773	642
15	0.095	594.5	494.2	45.1	1.088	11,042	3,138	---	---	---	---
12	0.116	582.6	496.8	49.2	1.085	11,315	3,136	---	---	---	---
3	0.127	588.3	494.0	47.6	1.086	11,308	3,133	2,716	595	2,706	585
30	0.170	597.2	501.1	49.1	1.082	11,510	3,125	2,992	660	2,963	632
8	0.114	588.8	490.3	47.1	1.085	11,296	3,111	2,671	540	2,641	510
2	0.185	598.2	496.2	45.5	1.083	11,197					

*Sorted by effect of treatment on value – fresh market, 2008 chemical prices (\$/A, decreasing)*

	Relative AUDPC <sup>1</sup>	Total cwt/A	US#1 cwt/A <sup>2</sup>	% 6-13 oz	Specific gravity	Gross value of yield (\$/A) <sup>3</sup>		Effect of treatment on value (2008 chemical prices) (\$/A) <sup>3</sup>		Effect of treatment on value (anticipated 2009 chemical prices) (\$/A) <sup>3</sup>	
						Fresh market	Processing	Fresh market	Processing	Fresh market	Processing
26	0.078	624.8	527.4	51.1	1.085	12,635	3,365	4,020	804	---	---
28	0.123	629.7	533.0	47.7	1.085	12,267	3,383	3,657	827	---	---
17	0.086	638.8	533.6	47.3	1.085	12,104	3,358	3,519	827	3,484	792
6	0.099	634.5	519.4	48.7	1.085	12,039	3,335	3,471	821	3,440	790
4	0.107	620.4	522.3	46.4	1.084	11,971	3,309	3,381	773	3,362	754
10	0.103	600.5	501.0	47.3	1.083	12,004	3,202	3,381	633	3,352	605
23	0.104	619.9	523.5	46.9	1.085	11,823	3,298	3,231	760	---	---
21	0.122	608.1	503.9	48.4	1.084	11,764	3,195	3,178	663	3,145	630
25	0.107	601.9	501.3	50.1	1.085	11,674	3,195	3,088	664	---	---
30	0.170	597.2	501.1	49.1	1.082	11,510	3,125	2,992	660	2,963	632
7	0.105	596.8	510.6	47.0	1.085	11,495	3,192	2,924	676	2,896	647
5	0.148	605.1	514.6	48.1	1.083	11,372	3,187	2,802	671	2,773	642
27	0.112	607.8	504.9	44.3	1.085	11,373	3,215	2,745	642	---	---
3	0.127	588.3	494.0	47.6	1.086	11,308	3,133	2,716	595	2,706	585
8	0.114	588.8	490.3	47.1	1.085	11,296	3,111	2,671	540	2,641	510
2	0.185	598.2	496.2	45.5	1.083	11,197	3,109	2,634	600	2,634	600
9	0.118	595.4	491.0	48.7	1.086	11,146	3,083	2,530	521	2,505	496
18	0.164	592.8	485.0	48.6	1.081	11,102	3,028	2,500	481	2,463	443
20	0.115	590.2	485.8	49.1	1.085	11,099	3,080	2,497	532	2,460	495
29	0.162	585.5	480.3	42.9	1.085	10,611	3,019	2,007	469	---	---
22	0.165	574.4	474.5	42.7	1.083	10,568	2,971	1,983	441	---	---
19	0.126	564.6	455.4	42.9	1.085	9,978	2,861	1,392	329	1,359	296
1	0.282	507.0	401.4	40.0	1.078	8,483	2,429	0	0	0	0
Pr>F <sup>4</sup>	<0.01	0.04	0.01	0.16	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
LSD	0.041	56.8	55.2	NS	0.004	1,493	357	1,487	341	1,489	330

Sorted by effect of treatment on value – processing, 2008 chemical prices (\$/A, decreasing)

	Relative AUDPC <sup>1</sup>	Total cwt/A	US#1 cwt/A <sup>2</sup>	% 6-13 oz	Specific gravity	Gross value of yield (\$/A) <sup>3</sup>		Effect of treatment on value (2008 chemical prices) (\$/A) <sup>3</sup>		Effect of treatment on value (anticipated 2009 chemical prices) (\$/A) <sup>3</sup>	
						Fresh market	Processing	Fresh market	Processing	Fresh market	Processing
28	0.123	629.7	533.0	47.7	1.085	12,267	3,383	3,657	827	---	---
17	0.086	638.8	533.6	47.3	1.085	12,104	3,358	3,519	827	3,484	792
6	0.099	634.5	519.4	48.7	1.085	12,039	3,335	3,471	821	3,440	790
26	0.078	624.8	527.4	51.1	1.085	12,635	3,365	4,020	804	---	---
4	0.107	620.4	522.3	46.4	1.084	11,971	3,309	3,381	773	3,362	754
23	0.104	619.9	523.5	46.9	1.085	11,823	3,298	3,231	760	---	---
7	0.105	596.8	510.6	47.0	1.085	11,495	3,192	2,924	676	2,896	647
5	0.148	605.1	514.6	48.1	1.083	11,372	3,187	2,802	671	2,773	642
25	0.107	601.9	501.3	50.1	1.085	11,674	3,195	3,088	664	---	---
21	0.122	608.1	503.9	48.4	1.084	11,764	3,195	3,178	663	3,145	630
30	0.170	597.2	501.1	49.1	1.082	11,510	3,125	2,992	660	2,963	632
27	0.112	607.8	504.9	44.3	1.085	11,373	3,215	2,745	642	---	---
10	0.103	600.5	501.0	47.3	1.083	12,004	3,202	3,381	633	3,352	605
2	0.185	598.2	496.2	45.5	1.083	11,197	3,109	2,634	600	2,634	600
3	0.127	588.3	494.0	47.6	1.086	11,308	3,133	2,716	595	2,706	585
8	0.114	588.8	490.3	47.1	1.085	11,296	3,111	2,671	540	2,641	510
20	0.115	590.2	485.8	49.1	1.085	11,099	3,080	2,497	532	2,460	495
9	0.118	595.4	491.0	48.7	1.086	11,146	3,083	2,530	521	2,505	496
18	0.164	592.8	485.0	48.6	1.081	11,102	3,028	2,500	481	2,463	443
29	0.162	585.5	480.3	42.9	1.085	10,611	3,019	2,007	469	---	---
22	0.165	574.4	474.5	42.7	1.083	10,568	2,971	1,983	441	---	---
19	0.126	564.6	455.4	42.9	1.085	9,978	2,861	1,392	329	1,359	296
1	0.282	507.0	401.4	40.0	1.078	8,483	2,429	0	0	0	0
Pr>F <sup>4</sup>	<0.01	0.04	0.01	0.16	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
LSD	0.041	56.8	55.2	NS	0.004	1,493	357	1,487	341	1,489	330

**Sorted by effect of treatment on value – fresh market, anticipated 2009 chemical prices (\$/A, decreasing)**

	Relative AUDPC <sup>1</sup>	Total cwt/A	US#1 cwt/A <sup>2</sup>	% 6-13 oz	Specific gravity	Gross value of yield (\$/A) <sup>3</sup>		Effect of treatment on value (2008 chemical prices) (\$/A) <sup>3</sup>		Effect of treatment on value (anticipated 2009 chemical prices) (\$/A) <sup>3</sup>	
						Fresh market	Processing	Fresh market	Processing	Fresh market	Processing
17	0.086	638.8	533.6	47.3	1.085	12,104	3,358	3,519	827	3,484	792
6	0.099	634.5	519.4	48.7	1.085	12,039	3,335	3,471	821	3,440	790
4	0.107	620.4	522.3	46.4	1.084	11,971	3,309	3,381	773	3,362	754
10	0.103	600.5	501.0	47.3	1.083	12,004	3,202	3,381	633	3,352	605
21	0.122	608.1	503.9	48.4	1.084	11,764	3,195	3,178	663	3,145	630
30	0.170	597.2	501.1	49.1	1.082	11,510	3,125	2,992	660	2,963	632
7	0.105	596.8	510.6	47.0	1.085	11,495	3,192	2,924	676	2,896	647
5	0.148	605.1	514.6	48.1	1.083	11,372	3,187	2,802	671	2,773	642
3	0.127	588.3	494.0	47.6	1.086	11,308	3,133	2,716	595	2,706	585
8	0.114	588.8	490.3	47.1	1.085	11,296	3,111	2,671	540	2,641	510
2	0.185	598.2	496.2	45.5	1.083	11,197	3,109	2,634	600	2,634	600
9	0.118	595.4	491.0	48.7	1.086	11,146	3,083	2,530	521	2,505	496
18	0.164	592.8	485.0	48.6	1.081	11,102	3,028	2,500	481	2,463	443
20	0.115	590.2	485.8	49.1	1.085	11,099	3,080	2,497	532	2,460	495
19	0.126	564.6	455.4	42.9	1.085	9,978	2,861	1,392	329	1,359	296
1	0.282	507.0	401.4	40.0	1.078	8,483	2,429	0	0	0	0
Pr>F <sup>4</sup>	<0.01	0.04	0.01	0.16	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
LSD	0.041	56.8	55.2	NS	0.004	1,493	357	1,487	341	1,489	330

**Sorted by effect of treatment on value – processing, anticipated 2009 chemical prices (\$/A, decreasing)**

	Relative AUDPC <sup>1</sup>	Total cwt/A	US#1 cwt/A <sup>2</sup>	% 6-13 oz	Specific gravity	Gross value of yield (\$/A) <sup>3</sup>		Effect of treatment on value (2008 chemical prices) (\$/A) <sup>3</sup>		Effect of treatment on value (anticipated 2009 chemical prices) (\$/A) <sup>3</sup>	
						Fresh market	Processing	Fresh market	Processing	Fresh market	Processing
17	0.086	638.8	533.6	47.3	1.085	12,104	3,358	3,519	827	3,484	792
6	0.099	634.5	519.4	48.7	1.085	12,039	3,335	3,471	821	3,440	790
4	0.107	620.4	522.3	46.4	1.084	11,971	3,309	3,381	773	3,362	754
7	0.105	596.8	510.6	47.0	1.085	11,495	3,192	2,924	676	2,896	647
5	0.148	605.1	514.6	48.1	1.083	11,372	3,187	2,802	671	2,773	642
30	0.170	597.2	501.1	49.1	1.082	11,510	3,125	2,992	660	2,963	632
21	0.122	608.1	503.9	48.4	1.084	11,764	3,195	3,178	663	3,145	630
10	0.103	600.5	501.0	47.3	1.083	12,004	3,202	3,381	633	3,352	605
2	0.185	598.2	496.2	45.5	1.083	11,197	3,109	2,634	600	2,634	600
3	0.127	588.3	494.0	47.6	1.086	11,308	3,133	2,716	595	2,706	585
8	0.114	588.8	490.3	47.1	1.085	11,296	3,111	2,671	540	2,641	510
9	0.118	595.4	491.0	48.7	1.086	11,146	3,083	2,530	521	2,505	496
20	0.115	590.2	485.8	49.1	1.085	11,099	3,080	2,497	532	2,460	495
18	0.164	592.8	485.0	48.6	1.081	11,102	3,028	2,500	481	2,463	443
19	0.126	564.6	455.4	42.9	1.085	9,978	2,861	1,392	329	1,359	296
1	0.282	507.0	401.4	40.0	1.078	8,483	2,429	0	0	0	0
Pr>F <sup>4</sup>	<0.01	0.04	0.01	0.16	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
LSD	0.041	56.8	55.2	NS	0.004	1,493	357	1,487	341	1,489	330

1. Relative area under the disease progress curve. Data for each date were plotted on a graph and the area under the line was calculated for each treatment providing a measure of the relative severity of disease through the season. A rating of 100% severity for the entire season would produce a value of 1.0. All relative AUDPC values are expressed as a proportion of this value. Either decreased disease severity or later disease development will contribute to lower relative AUDPC. AUDPC was calculated from 24 Jun – 2 Sep.
2. Excludes undersize (potatoes < 1 7/8" in diameter) and culls (rotted, severely misshapen or green).
3. See **Table 3** for complete information about value calculations. Gross value was calculated for all treatments. The effect of treatment on value was calculated for treatments where all components had a known retail price. If **ANY** component of the treatment was an experimental product with no retail price, the cost of chemicals was not calculated. Net value of yield = gross value minus cost of chemicals applied (shown in Table 3). If price was unavailable for ANY component of the treatment, net value was not calculated. Effect of treatment on value = Net value for the treatment minus net value of the untreated control.
4. Analysis of variance was performed on data, and Fisher's protected least significant difference (LSD) was calculated (alpha=0.05).