

Effect of In-Row Genica on Yield of Norkotah Potato, in Comparison to Fungicides Ridomill & Quadris.

Summary

In-row applications of IBR Genica POFE 200 Liquid Concentrate led to substantial increases in yield from 32 to 37%. The crop value increased 28 to 46%.

Although tuber size distribution was more in favor of higher amounts of deep-pitted scab (larger tubers), the IBR Genica treatments resulted in lower levels of the scab in spite of a larger percentage of large tubers.

Background

The main objective of this study was to evaluate the effect of in-row Genica on the set of Norkotah, a russet variety. The cooperator was a “fresh-pack” grower, therefore visual quality and size are important.

The Genica was applied at 2 rates and inoculated. It was compared against standard fungicides Ridomil & Quadris.

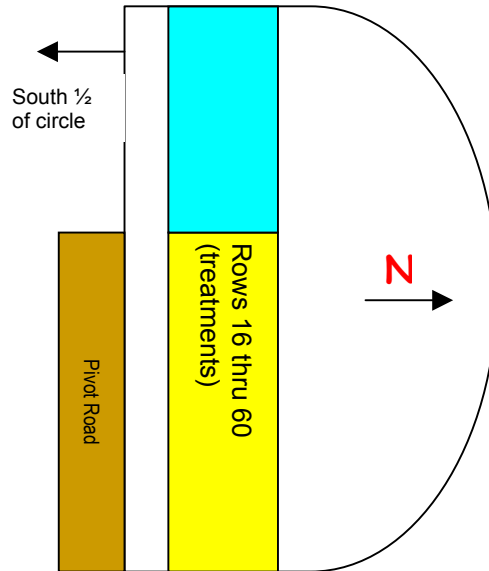
Materials & Methods

An in-row liquid applicator kit consisting of 4-6 nozzles and a 20-gallon tank with an electric pump was used. The nozzles were mounted to provide coverage over the top of the seed as the row was closing.

Each product was mixed with enough water so that it could be applied at 5 gallons per acre.

Treatment	Material	Rate/Acre	Row #'s
Con-1	Control	N/A	1 to 16
Gen-T-1	Genica	2 gal	17 to 24
Gen-T-2	Genica	3 gal	25 to 32
Gen-T-3	Genica Inoculated	2 gal + BXi	33 to 40
Qud-T-4	Quadris	6 oz	41 to 48
Nue-T-5	NUE 8-22-0	2 gal	49 to 52
Rido-T-6	Ridomill Gold	6 oz	52 to 60
Con-2	Control	N/A	61 to 76

The table above & the map below give an indication of the location and size of treatments. All but the Nue T-5 are 8 rows.



Results

Growth – The field was visually evaluated during the growing season. No visible effects on top growth were noted.

Yield Data – In each trial 3 X 10-foot hand digs were taken.

Yield Data (Actual Pounds)

	Con-1 a	Con-1 b	Con-1 c	Gen T-1 a	Gen T-1 b	Gen T-1 c
Culls & <2"	2.70	6.75	5.30	6.15	8.90	9.00
4 oz - 8 oz	16.15	17.70	18.80	19.95	25.45	18.95
8 oz - 10 oz	8.75	6.40	3.85	8.30	8.35	6.55
10 oz - 12 oz	3.90	1.25	1.30	4.25	5.30	2.05
12 oz - 14 oz	3.05	0.80	0.75	4.00	0.75	2.35
14 oz - 16 oz	0.90	1.85	0.85	0.00	0.00	1.85
16 oz & Over	1.05	0.00	1.20	1.00	0.00	2.45
#2 - 8 oz - 16 oz	0.00	0.00	0.50	0.80	0.00	0.00
#2 - 16 oz & Over	0.00	0.00	2.00	0.00	0.00	0.00
Total lbs/plot	36.50	34.75	34.55	44.45	48.75	43.20
Total Diseased	7.65	11.45	13.60	7.30	10.35	19.20

	Gen T-2 a	Gen T-2 b	Gen T-2 c	Gen T-3 a	Gen T-3 b	Gen T-3 c
Culls & <2"	7.60	6.60	6.35	6.50	6.05	3.85
4 oz - 8 oz	19.20	20.25	20.80	21.80	18.25	17.70
8 oz - 10 oz	8.75	10.50	9.50	4.95	8.60	9.30
10 oz - 12 oz	2.05	6.00	4.10	6.65	4.10	6.65
12 oz - 14 oz	0.00	0.75	3.15	3.05	5.75	5.40
14 oz - 16 oz	0.00	0.00	1.75	0.00	0.85	1.85

	Gen T-2 a	Gen T-2 b	Gen T-2 c	Gen T-3 a	Gen T-3 b	Gen T-3 c
16 oz & Over	1.05	0.00	1.60	0.00	3.20	2.10
#2 - 8 oz - 16 oz	0.75	0.00	1.85	0.00	0.00	0.00
#2 - 16 oz & Over	0.00	0.00	0.00	0.00	0.00	0.00
Total lbs/plot	39.40	44.10	49.10	42.95	46.80	46.85
Total Diseased	4.05	15.20	9.30	7.15	7.65	13.80

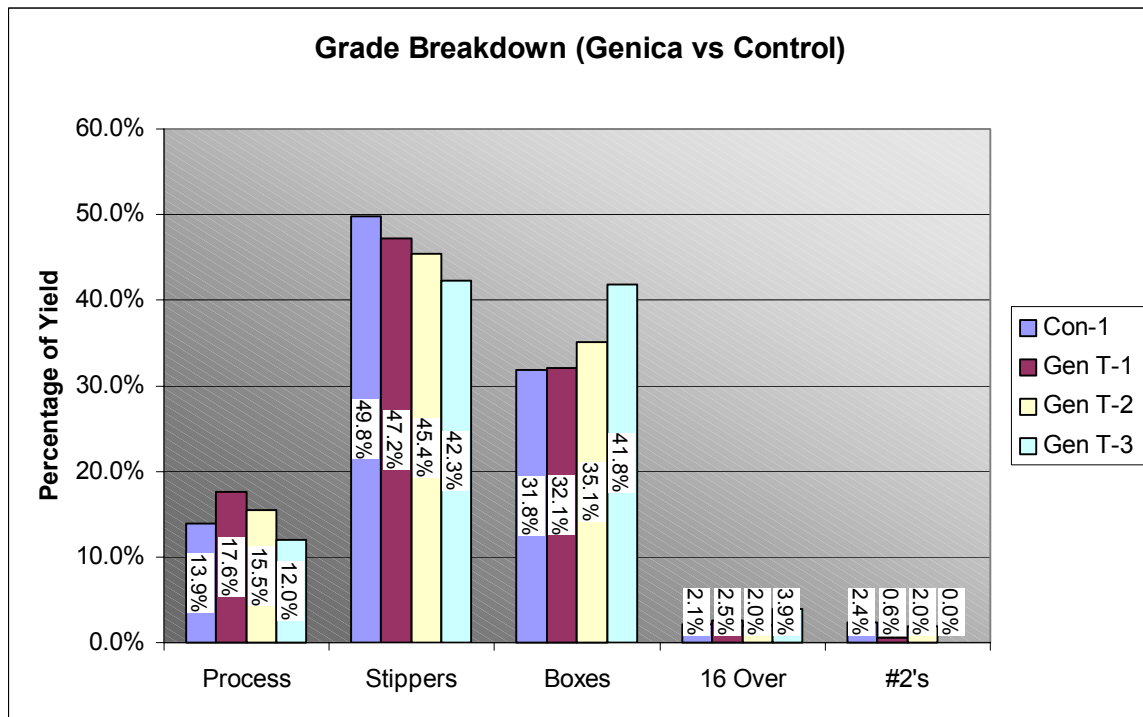
	Qud T-4 a	Qud T-4 b	Qud T-4 c	Nue T-5 a	Nue T-5 b	Nue T-5 c
Culls & <2"	4.65	5.70	4.50	4.75	5.50	5.85
4 oz - 8 oz	20.15	13.55	17.05	17.80	17.55	17.35
8 oz - 10 oz	4.85	8.75	4.40	6.55	16.90	4.50
10 oz - 12 oz	1.20	2.65	2.70	4.70	4.00	6.95
12 oz - 14 oz	1.55	0.75	0.75	2.35	2.30	1.55
14 oz - 16 oz	0.00	0.00	1.85	0.85	0.00	2.70
16 oz & Over	2.45	1.00	1.10	4.45	1.15	0.00
#2 - 8 oz - 16 oz	0.00	0.00	0.00	0.00	0.60	0.00
#2 - 16 oz & Over	0.00	0.00	0.00	0.00	0.00	0.00
Total lbs/plot	34.85	32.40	32.35	41.45	48.00	38.90
Total Diseased	9.00	15.40	11.75	12.00	15.65	11.25

	Rid T-6 a	Rid T-6 b	Rid T-6 c	Con-2 a	Con-2 b	Con-2 c
Culls & <2"	5.25	4.55	3.80	4.35	4.90	4.15
4 oz - 8 oz	16.30	12.00	18.35	13.85	17.55	9.55
8 oz - 10 oz	5.95	9.95	7.65	7.85	8.60	5.30
10 oz - 12 oz	4.20	5.35	1.75	4.00	3.40	4.10
12 oz - 14 oz	3.95	3.90	0.85	0.00	0.85	1.70
14 oz - 16 oz	1.80	0.00	0.00	0.90	1.90	0.00
16 oz & Over	2.10	1.30	3.15	0.00	1.10	0.00
#2 - 8 oz - 16 oz	0.00	0.00	0.00	0.00	0.00	0.00
#2 - 16 oz & Over	0.00	0.00	0.00	0.00	0.00	0.00
Total lbs/plot	39.55	37.05	35.55	30.95	38.30	24.80
Total Diseased	9.75	21.10	13.85	9.05	13.90	6.35

Yield Data (Percentage of Grade)

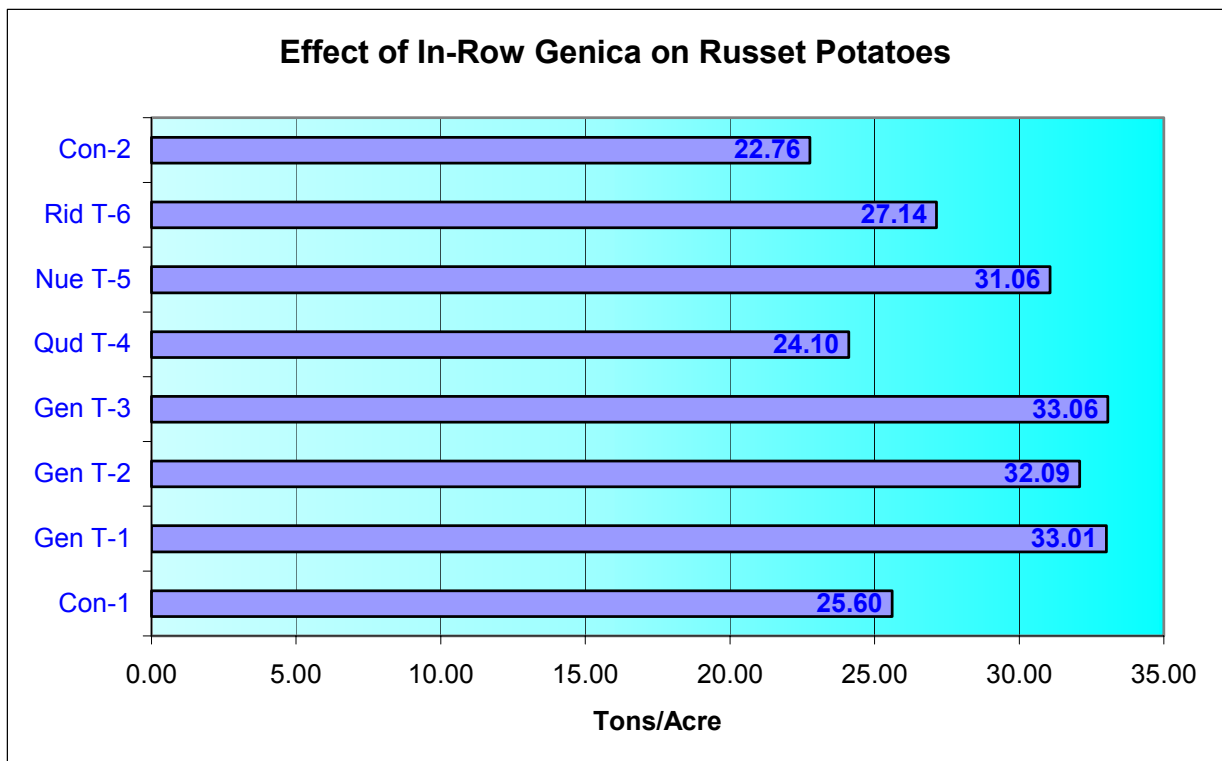
The yield was graded for the Russet Fresh Pack market. Culls & < 2” & “diseased” were considered as process potatoes, 4 to 8 ounces as “stippers” or “polys” and the 8 ounce and above as “boxes”.

	Con-1	Gen T-1	Gen T-2	Gen T-3	Qud T-4	Nue T-5	Rid T-6	Con-2
Process	13.9%	17.6%	15.5%	12.0%	14.9%	12.5%	12.1%	14.2%
Stippers	49.8%	47.2%	45.4%	42.3%	51.0%	41.1%	41.6%	43.5%
Boxes	31.8%	32.1%	35.1%	41.8%	29.6%	41.6%	40.4%	41.0%
16 Over	2.1%	2.5%	2.0%	3.9%	4.6%	4.4%	5.8%	1.2%
#2's	2.4%	0.6%	2.0%	0.0%	0.0%	0.5%	0.0%	0.0%



Yield Data (Total Pounds)

	Con-1	Gen T-1	Gen T-2	Gen T-3	Qud T-4	Nue T-5	Rid T-6	Con-2
Culls & <2"	14.75	24.05	20.55	16.40	14.85	16.10	13.60	13.40
4 oz - 8 oz	52.65	64.35	60.25	57.75	50.75	52.70	46.65	40.95
8 oz - 10 oz	19.00	23.20	28.75	22.85	18.00	27.95	23.55	21.75
10 oz - 12 oz	6.45	11.60	12.15	17.40	6.55	15.65	11.30	11.50
12 oz - 14 oz	4.60	7.10	3.90	14.20	3.05	6.20	8.70	2.55
14 oz - 16 oz	3.60	1.85	1.75	2.70	1.85	3.55	1.80	2.80
16 oz & Over	2.25	3.45	2.65	5.30	4.55	5.60	6.55	1.10
#2 - 8 oz - 16 oz	0.50	0.80	2.60	0.00	0.00	0.60	0.00	0.00
#2 - 16 oz & Over	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Lbs/Plot	105.8	136.4	132.6	136.6	99.6	128.4	112.2	94.05
% Yield	100.0%	136.5%	132.7%	136.7%	99.7%	128.4%	112.2%	100.0%
(% of Yield is on Average of TWO Controls)								
Total Diseased	32.70	36.85	28.55	28.60	36.15	38.90	44.70	29.30
% Diseased	31%	27%	22%	21%	36%	30%	40%	31%

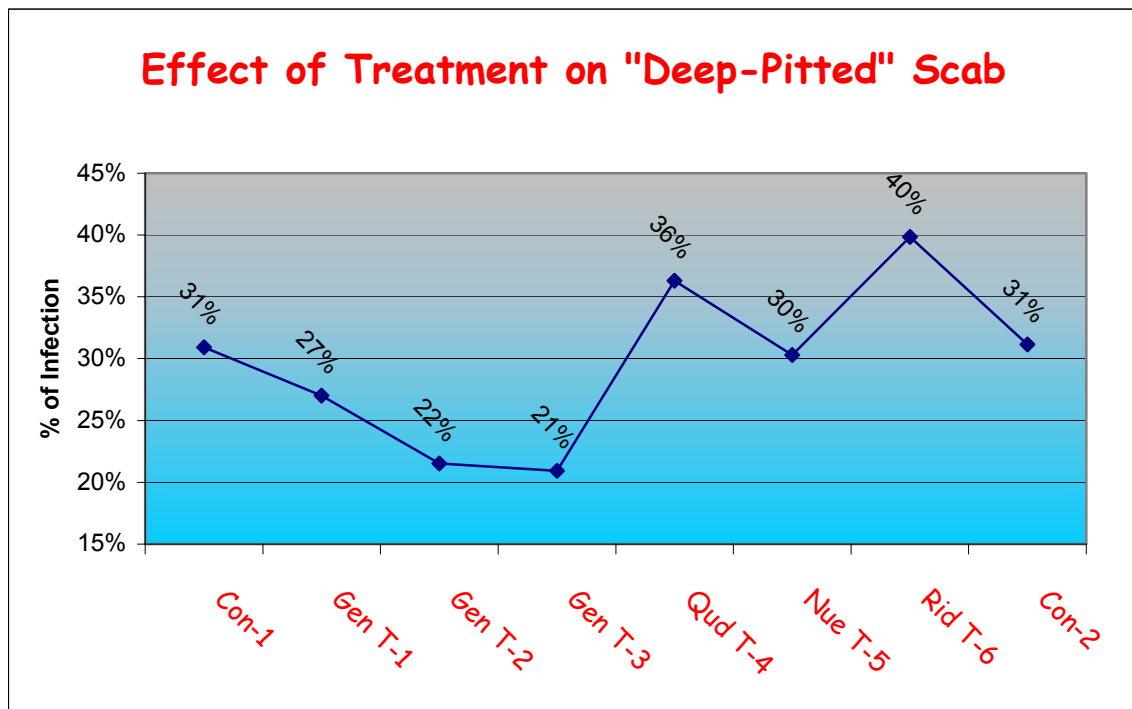


Yield Data (Diseased)

The previous years crop in this circle was field corn, which was irrigated with potato processor effluent water. There is significant potential for diseases that are not suppressed by the corn crop, including “deep-pitted” scab.

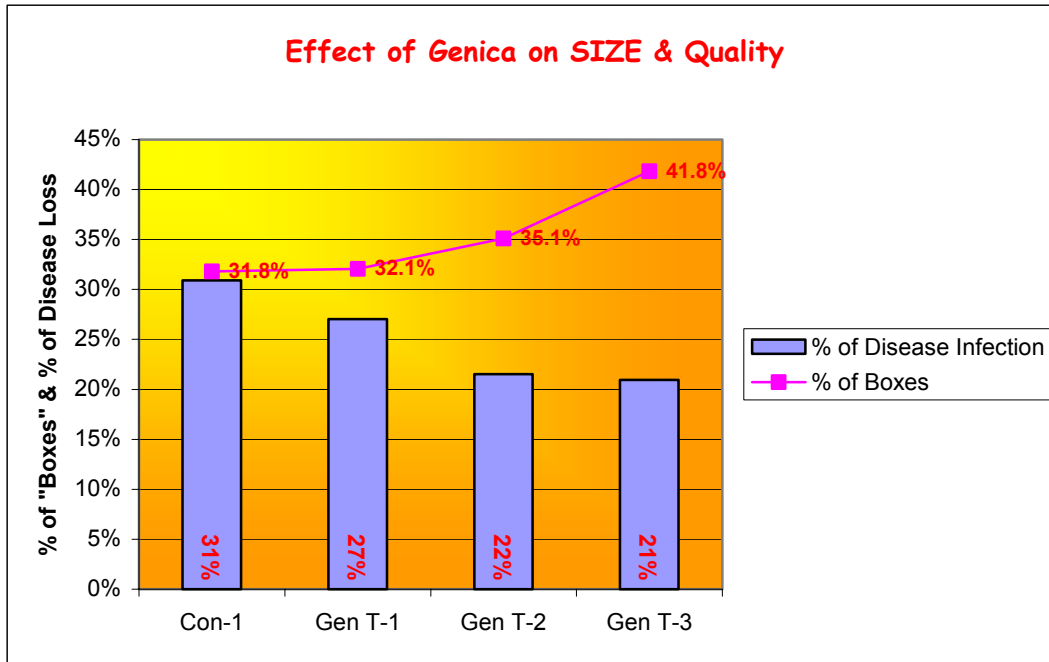
The part of the field where the IBR materials were applied had high levels of this particular infection.

	Con-1	Gen T-1	Gen T-2	Gen T-3	Qud T-4	Nue T-5	Rid T-6	Con-2
Total Diseased	32.70	36.85	28.55	28.60	36.15	38.90	44.70	29.30
% Diseased	31%	27%	22%	21%	36%	30%	40%	31%



Yield vs Quality (Diseased)

The tubers with deep-pitted scab were larger tubers in all samples. Very few diseased tubers were from the “stripper” size (4 to 8 ounce tubers). The number of “boxes” (larger potatoes) was largest in the Genica treatments with the lowest incidence of disease.



*Note: It would be expected that the treatment with 10% more boxes would have more pounds of “diseased” tubers, which is not the case.

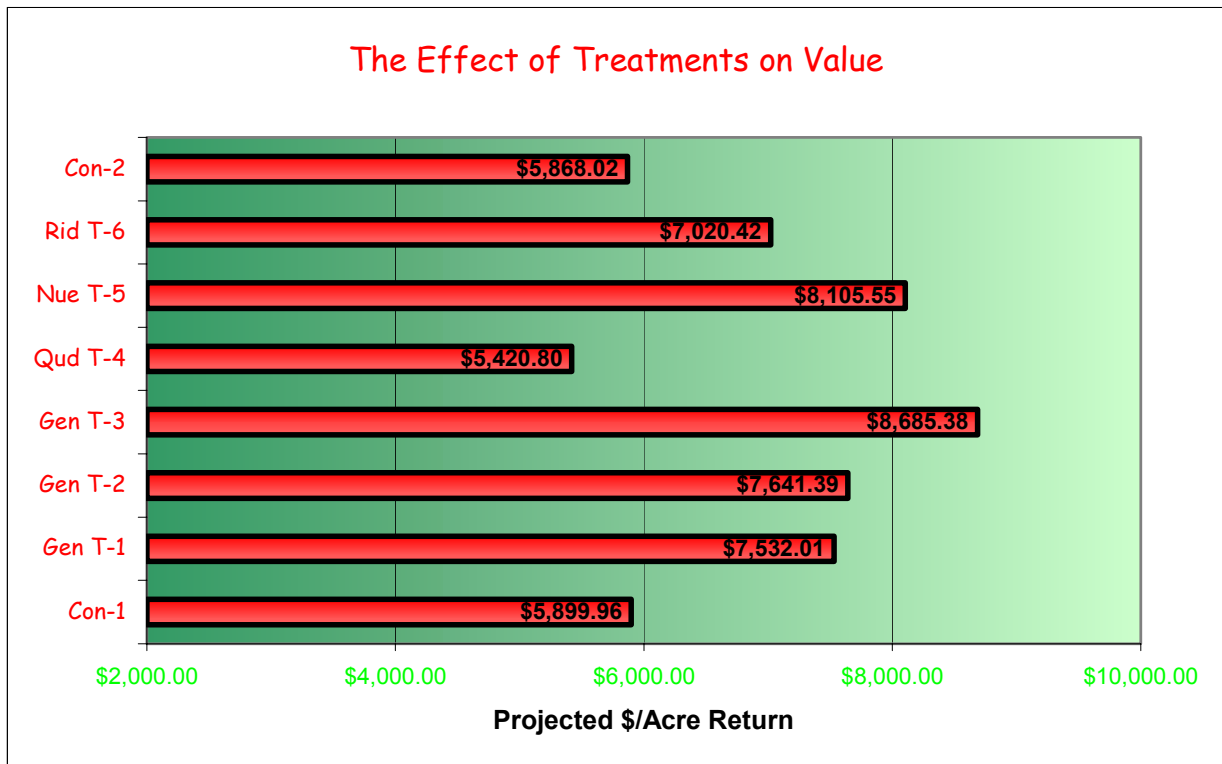
Financial Data (ALL Tests)

The following table illustrates the value of each size range in \$/cwt (hundred pounds) and per ton.

	\$/cwt	\$/ton
Culls	\$2.00	\$40.00
Stripper	\$8.00	\$160.00
Cartons	\$22.00	\$440.00
Baker	\$8.00	\$160.00
#2's	\$4.00	\$80.00

	Con-1	Gen T-1	Gen T-2	Gen T-3	Qud T-4	Nue T-5	Rid T-6	Con-2
Process	\$142.78	\$232.80	\$198.92	\$158.75	\$143.75	\$155.85	\$131.65	\$129.71
Stippers	\$2,038.61	\$2,491.63	\$2,332.88	\$2,236.08	\$1,965.04	\$2,040.54	\$1,806.29	\$1,585.58
Boxes	\$3,583.05	\$4,658.50	\$4,956.64	\$6,085.33	\$3,135.84	\$5,680.71	\$4,828.87	\$4,110.13
16 Over	\$87.12	\$133.58	\$102.61	\$205.22	\$176.18	\$216.83	\$253.62	\$42.59
#2's	\$48.40	\$15.49	\$50.34	\$0.00	\$0.00	\$11.62	\$0.00	\$0.00

	Con-1	Gen T-1	Gen T-2	Gen T-3	Qud T-4	Nue T-5	Rid T-6	Con-2
Total \$/Acre	\$5,899.96	\$7,532.01	\$7,641.39	\$8,685.38	\$5,420.80	\$8,105.55	\$7,020.42	\$5,868.02



Discussion

Although the 3-gallon rate of Genica yielded lower than the 2-gallon rate, it did result in a better return per acre because of the slightly better size (less set) of the potatoes. In contrast to varieties such as yellows, whites and reds, less set and larger size in an important factor in russet production. Further tests of 2 and 3 gallon rates alongside higher rates of IBR Genica are warranted to evaluate the effect of higher application rates on set and marketable size.

Technologies and methods for the control and/or suppression of scab is a much-needed tool in potato production.