

# Evaluation of Various Treatments on Potato Scab in Wisconsin

## Summary

IBR Genica products exhibited a positive effect on scab in chipper varieties of potatoes in Wisconsin. IBR Genica POFC 100 showed 2X the scab free potatoes as many common chemical treatments and 3X control. Yield improvement as a secondary objective was very positive as well.

## Background

There are 3 types of scab that effect potato production in various areas of the US and other countries. The common names are “common” scab, “pit” scab and “powdery” scab.

In WI, common scab and pit scab are most likely to form. In MI, ND and TX, all three are a problem. Scab can be a problem in up to 10% of the acreage in Wisconsin.

Scab is a difficult disease to control. There are very few common fungicides that are effective. “Blocker” is one of the most widely used and reduces scab by 50%.

## Materials & Methods

This trial was “hand planted”. The planter passed through the field and the rows needed for the trial were opened and treated with appropriate treatment. This allowed for the banding of fertilizer by the planter to achieve the same base line fertility as the rest of the field. The seed pieces were re-aligned so that the spacing was exactly 14”, the desired spacing for the Snowden variety. In order to reduce variability from seed, seed was selected around 2” in size with similar seep piece positioning in the furrow.

Treatment	Application	Abbreviation	Replication Order			
Check	N/A	Con	3	4	6	1
50#/ac Sulfur	At planting	Sul	6	1	5	2
4.5 ozs/ac X 3 app Messenger	4.5 oz @ planting 4.5 oz @ 6” 4.5 oz @ hooking	Mess	2	6	4	3
8 pints/acre Phostrol	6 pts @ planting 2 pts @ 6”	Phos	5	2	3	4
2 ozs/acre Actigard	2 oz/ac Foliar @ 6”	Acti	1	3	2	5
8 ozs/acre Omega	2 oz/ac Foliar @ 6”	Omg	4	5	1	6

Treatment	Application	Abbreviation	Replication Order			
200 #/ac Genica (D)	At planting	D-200	9	8	10	7
200 #/ac Genica (D) + 10 gal Genica	At planting	D+Gen	10	7	9	8
10 gal/ac Genica + 40 # Ca	At planting	G+Ca	7	10	8	9
500 #/ac Genica (D)	At planting	D-500	8	9	7	10

## Results

Plant and stem counts were completed on June 26<sup>th</sup>, 2001.

	Con	Con	Sul	Sul	Mess	Mess	Phos	Phos	Acti	Acti
	Plants	Stems	Plants	Stems	Plants	Stems	Plants	Stems	Plants	Stems
Rep-1	20	112	20	108	18	91	19	103	22	114
Rep-2	20	103	19	98	20	112	21	102	18	101
Rep-3	20	106	20	103	22	109	19	104	20	113
Rep-4	21	108	20	110	20	123	21	100	20	106
Total	81	429	79	419	80	435	80	409	80	434
Average		5.30		5.30		5.44		5.11		5.43

	Omg	Omg	D-200	D-200	D+Gen	D+Gen	G+Ca	G+Ca	D-500	D-500
	Plants	Stems	Plants	Stems	Plants	Stems	Plants	Stems	Plants	Stems
Rep-1	21	100	21	106	22	106	21	114	22	101
Rep-2	20	104	21	131	22	131	22	113	20	117
Rep-3	18	99	22	119	21	119	21	107	21	121
Rep-4	20	100	21	103	21	103	21	104	22	111
Total	79	403	85	459	86	459	85	438	85	450
Average		5.10		5.40		5.34		5.15		5.29

### Scab Evaluation #1 (Early - July 7<sup>th</sup> 2001)

A 4-stem plant was taken from each treatment and evaluated for the visual appearance of scab.

	# of Potatoes	Scab Rating
Con	17	7
Sul	14	5
Mess	16	8
Phos	18	6
Acti	14	10
Omg	14	2
D-200	16	9

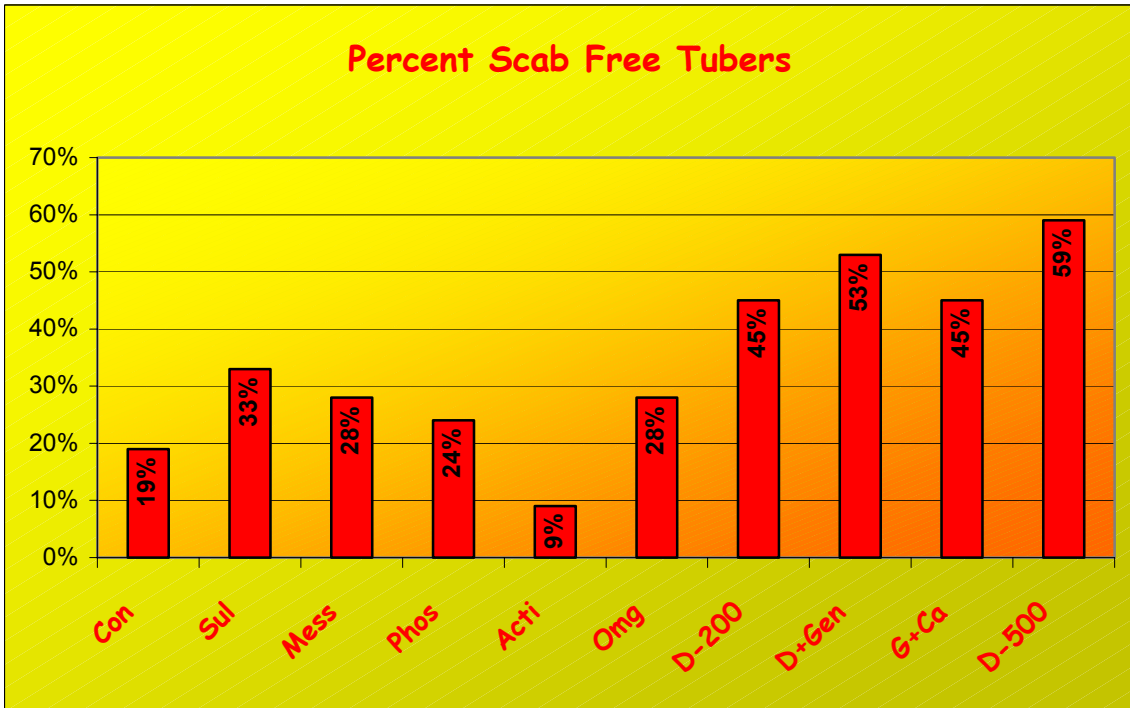
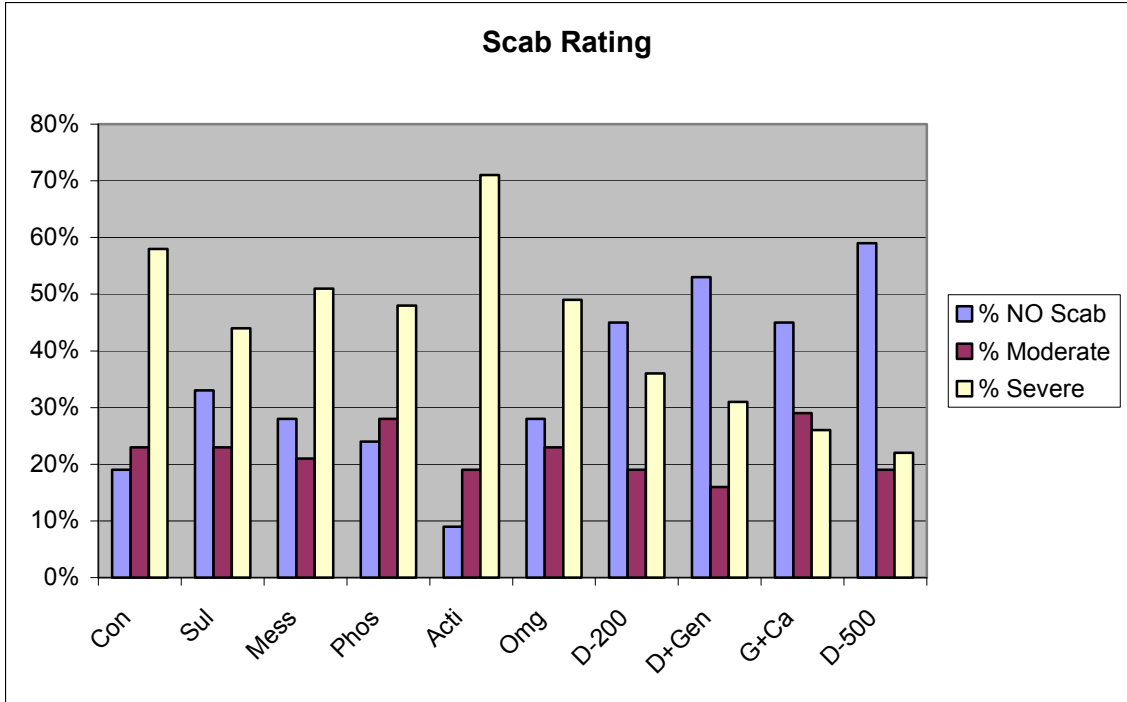
	<b># of Potatoes</b>	<b>Scab Rating</b>
D+Gen	14	4
G+Ca	22	1
D-500	22	3

\*Note the response, both in the scab and the high set, of the liquid Genica + additional calcium and the higher rate of IBR Genica POFC 100 Granular.

### Scab Evaluation #2 (Harvest)

At harvest, tubers from each plot in the 6 to 10 ounce range were visually evaluated for “NO”, “moderate” and “severe” scab. The number of tubers was divided into the total tubers to calculate the % of each rating.

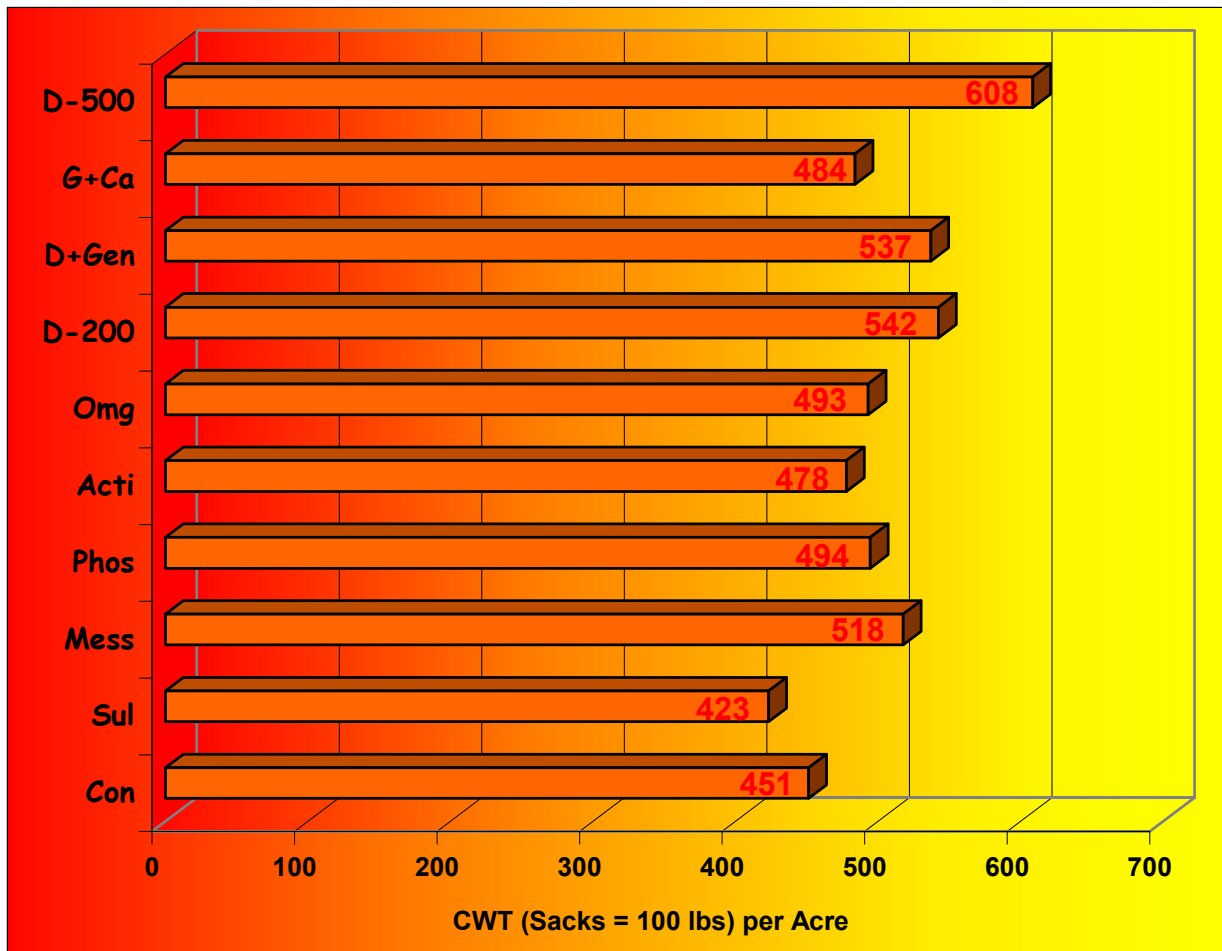
	<b>NO Scab</b>		<b>Moderate Scab</b>		<b>SEVERE Scab</b>	
	<b># of Tubers</b>	<b>% Scab</b>	<b># of Tubers</b>	<b>% Scab</b>	<b># of Tubers</b>	<b>% Scab</b>
Con	34	19%	40	23%	101	58%
Sul	55	33%	38	23%	74	44%
Mess	48	28%	37	21%	89	51%
Phos	46	24%	54	28%	93	48%
Acti	14	9%	29	19%	109	71%
Omg	63	28%	52	23%	110	49%
D-200	85	45%	36	19%	67	36%
D+Gen	104	53%	31	16%	61	31%
G+Ca	98	45%	64	29%	57	26%
D-500	140	59%	44	19%	53	22%



## Yield Data (Hand Digs)

	Con	Sul	Mess	Phos	Acti
Less 1 7/8" (b's)	57.50	56.25	77.50	60.50	56.00
< 6 Ounces	137.50	168.50	203.25	186.00	196.00
6 to 10 oz	107.00	59.75	72.00	88.75	70.75
> 10 ounces	8.75	7.00	3.75	5.25	6.25
Total	310.75	291.50	356.50	340.50	329.00
Sacks/Acre	<b>451</b>	<b>423</b>	<b>518</b>	<b>494</b>	<b>478</b>

	Omg	D-200	D+Gen	G+Ca	D-500
Less 1 7/8" (b's)	65.00	69.00	61.25	40.50	91.00
< 6 Ounces	180.50	213.75	215.00	186.50	209.25
6 to 10 oz	90.00	80.75	91.50	100.75	109.25
> 10 ounces	4.00	10.00	2.00	5.50	9.50
Total	339.50	373.50	369.75	333.25	419.00
Sacks/Acre	<b>493</b>	<b>542</b>	<b>537</b>	<b>484</b>	<b>608</b>

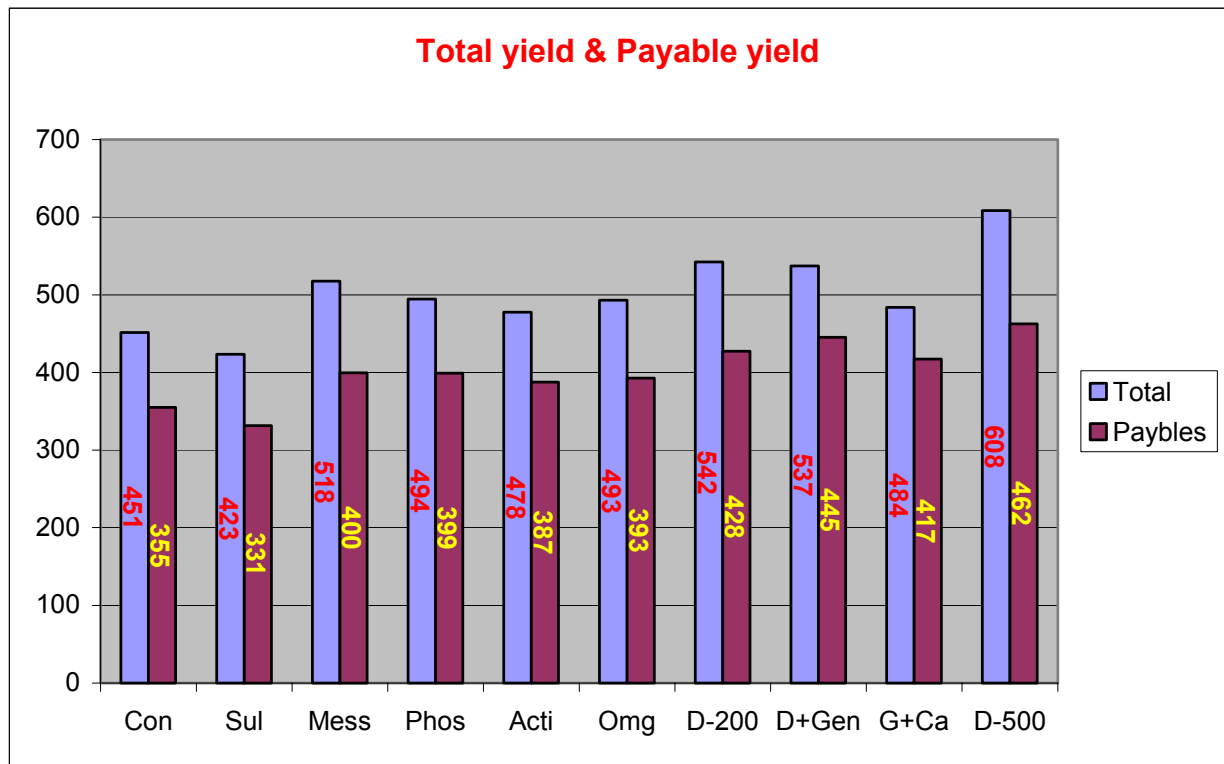


## Yield Data (Quality)

Analysis of the % grade to determine the % payables:

	Con	Sul	Mess	Phos	Acti	Omg	D-200	D+Gen	G+Ca	D-500
Less 1 7/8" (b's)	18.5%	19.3%	21.7%	17.8%	17.0%	19.1%	18.5%	16.6%	12.2%	21.7%
< 6 Ounces	44.2%	57.8%	57.0%	54.6%	59.6%	53.2%	57.2%	58.1%	56.0%	49.9%
6 to 10 oz	34.4%	20.5%	20.2%	26.1%	21.5%	26.5%	21.6%	24.7%	30.2%	26.1%
> 10 ounces	2.8%	2.4%	1.1%	1.5%	1.9%	1.2%	2.7%	0.5%	1.7%	2.3%
Total NON Payable	21.3%	21.7%	22.8%	19.3%	18.9%	20.3%	21.2%	17.1%	13.8%	24.0%
Total PAYABLE	78.7%	78.3%	77.2%	80.7%	81.1%	79.7%	78.8%	82.9%	86.2%	76.0%
Payable Sacks/Ac	355	331	400	399	387	393	428	445	417	462

Compared to total yield in sacks per acre, the order of improvement does not change, but the large amount of small tubers in the IBR-Dry at 500 lbs/acre is noticeable. This is likely due to a release of late-season nitrogen.



## Yield Data (Tuber Counts)

The total amount of tubers was also recorded as an indication of the % of tubers in each category, as well as the average weight of the tubers.

	Con	Sul	Mess	Phos	Acti	Omg	D-200	D+Gen	G+Ca	D-500
< 6 Ounces	637	577	754	657	760	708	859	728	717	746
6 to 10 oz	244	121	165	195	148	225	155	207	208	237
> 10 ounces	13	10	5	7	8	6	18	3	5	11
Total # of Tubers	<b>894</b>	<b>708</b>	<b>924</b>	<b>859</b>	<b>916</b>	<b>939</b>	<b>1032</b>	<b>938</b>	<b>930</b>	<b>994</b>
< 6 Ounces	71.3%	81.5%	81.6%	76.5%	83.0%	75.4%	83.2%	77.6%	77.1%	75.1%
6 to 10 oz	27.3%	17.1%	17.9%	22.7%	16.2%	24.0%	15.0%	22.1%	22.4%	23.8%
> 10 ounces	1.5%	1.4%	0.5%	0.8%	0.9%	0.6%	1.7%	0.3%	0.5%	1.1%

## Soil Test Data (Plot Variance AFTER TREATMENT)

Soil samples were pulled on July 7<sup>th</sup> to correlate the effect of pH against the scab rating. The two treatments most likely to get scab would be the “Phos” and “Omg” at a pH of 6.5 & 6.4, respectively.

	OM%	P	K	Mg	Ca	pH	Buff pH	CEC	S	Zn
Con	1.0	133	77	95	550	<b>6.2</b>	6.9	4.9	14	8.5
Sul	0.8	137	77	100	550	<b>6.1</b>	6.9	5.0	17	8.5
Mess	0.9	141	87	105	600	<b>6.2</b>	7.0	5.3	17	8.9
Phos	0.8	137	75	105	350	<b>6.5</b>	6.9	2.8	12	7.3
Acti	0.8	143	83	105	550	<b>6.2</b>	6.9	5.0	14	7.9
Omg	0.7	157	86	100	400	<b>6.4</b>	6.9	4.3	12	53.2
D-200	0.8	140	95	80	300	<b>5.5</b>	6.9	3.6	23	9.4
D+Gen	1.0	150	90	80	300	<b>5.5</b>	6.9	3.6	21	9.9
G+Ca	0.8	147	97	85	350	<b>5.8</b>	6.9	3.9	17	9.9
D-500	1.0	131	77	80	300	<b>5.7</b>	6.9	3.6	15	9.2

## Discussion

Scab is a serious problem in many areas of potato production and often fields are not planted due to a known scab problem. Potato scab is a very unforgiving disease to have in a field, consider that in the control 58% of the production is severely damaged and an additional 23% that is moderately damaged leaving only 19% that could be graded and sold.

There are very few chemistries known to consistently control potato scab. IBR Genica treatments are very promising. Scab comes on late in the season when most of the inputs are already in the ground, so abandoning a field is not a

desirable option. Fumigation has little effect. Most growers simply abandon the fields in which scab is found.

It can be concluded that IBR Genica treatments are effective scab suppressants. Further demonstrations are indicated to determine if the treatment can be considered a control.

This test plot demonstration also provided a look at IBR Genica POFC 100 Granular in a replicated test plot situation in comparison to products such as Messenger.