

**AIM Trial Report:** Effectiveness of Minuet on Scab Control  
**Working Group:** Seed & Tuber Quality  
**Crop Year:** 2024  
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### **Project Rationale:**

Common scab, caused primarily by *Streptomyces spp.* bacteria, continues to be a significant source of loss in marketable yield for PEI potato producers. While there has been a movement toward varieties that are more resistant to common scab, there are no varieties commonly grown in PEI that are completely resistant to scab. Furthermore, there are few cultural practices or control products that have shown consistent control of common scab. One of the few cultural practices that has been associated with lower levels of common scab is lower soil pH levels; conversely, low pH can have a negative effect on nutrient availability and on yield potential in potatoes and in other rotation crops.

Recent research conducted under the FVGC's national cluster project on common scab indicated that the use of the Bayer in-furrow biopesticide Serenade Soil may help to suppress common scab symptoms. Serenade Soil has not been routinely used on most PEI farms, so there was interest from the Working Group to look into this more on a field scale. Bayer has since rebranded Serenade Soil as Minuet, so we undertook field scale trials starting in 2023 to evaluate this product for scab control. Results for two out of three fields in 2023 indicated that Minuet reduced common scab incidence and severity. As a result, five additional trial fields were added in 2024 to further investigate the potential for Minuet to suppress common scab symptoms under commercial conditions in Prince Edward Island.

Minuet® is a biological fungicide labelled in Canada for suppression of Rhizoctonia root rot, black scurf and stem canker, Fusarium root rot, pink rot, and Pythium root rot and cavity spot. It is sold as an aqueous suspension of a strain of beneficial bacteria (*Bacillus subtilis* strain QST 713). It is applied in-furrow with the spray nozzle directed ahead just before seeds are covered. It is also labelled for soil surface application or through irrigation water.

### **Project Overview:**

Four farms participated in this trial, MacSull Farms (Long River), MacLennan Properties (Springfield West), MacAulay Farms (Souris) and Hilltop Produce (Newton). Three fields were located in East Prince, with an additional field each in West Prince and Kings County.

Specifics for each of the five trial fields:

<b>Field ID</b>	<b>Variety</b>	<b>Planting Date</b>	<b>Harvest Date</b>
A	Prospect	May 14	September 23
B	Prospect	May 14	September 23
C	Prospect	May 20	September 25
D	Alverstone Russet	May 13	September 26
E	Ranger Russet	May 22	October 2

Each of the selected fields were planted with forages in 2023. Fields A-D were planted with a legume/grass forage mix. Field E was planted with ryegrass which was harvested for seed, with the majority of crop residue left on the field.

Minuet was applied in furrow at planting at a rate of 379 mL/acre.

At harvest, four ten-foot strips were harvested per treatment in Fields A, B, C and D. In field E, six ten-foot strips were harvested per treatment due to a greater observed amount of common scab symptoms. To reduce the impact of background field variability, samples were dug close on either side of the treatment split.

Samples were graded based on size; smalls (<1 7/8”), over 1 7/8” and over 10 ounces. Off type potatoes were treated as culls. Based on scab severity, some tubers were noted as unmarketable based on a processing grading standard. All tubers were weighed and counted. Canada #1 is considered total yield with smalls (<1 7/8”), off-type and culls as well as unmarketable scab subtracted. Yield in cwt/acre was calculated based on a factor of 13 multiplied by pounds per ten feet.

Following grading for yield and size, a random subset of tubers from each sample were then graded for percent scab and scab severity by AAFC staff.

**Potato Yield and Quality:**

**Field A: Prospect - Yield and Size Profile:**

Treatment	Total Yield	Smalls	>10 oz.	Off Type/Culls	Marketable Yield
	cwt/ac.	%			cwt/ac.
<b>Minuet</b>	307.7	2.4	21.5	0.8	298.0
<b>Control</b>	309.7	2.9	16.0	0	301.0
<b>Difference</b>	-2.0	-0.5	5.5	0.8	-3.0
<b>p value</b>	0.91	0.75	0.39	0.15	0.89

**Field A: Prospect - Tuber Quality**

Treatment	% Scab	Scab Severity	% Rhizoc	% Silver Scurf
<b>Minuet</b>	0.42	0.20	4.61	2.14
<b>Control</b>	0.11	0.07	9.73	2.43
<b>Difference</b>	0.31	0.13	-5.12	-0.29
<b>p value</b>	0.112	0.029	< 0.001	0.660

In Field A, there was no significant differences observed for yield and size profile variables. There was significantly higher percent scab in the Minuet treatment than the control; however, it should be noted that both treatment and control had very low average scab, with the majority of tubers scored zero. The same can be said for scab severity. For percentage Rhizoctonia black scurf, there was a significant decrease in symptoms in favour of Minuet (53% reduction), with no difference observed in percentage silver scurf.

**Field B: Prospect - Yield and Size Profile:**

Treatment	Total Yield	Smalls	>10 oz.	Off Type/Culls	Marketable Yield
	cwt/ac.	%			cwt/ac.
<b>Minuet</b>	346.7	2.3	22.4	0	339.0
<b>Control</b>	322.8	2.3	12.5	0.3	314.6
<b>Difference</b>	23.9	0	9.9	-0.3	24.4
<b>p value</b>	0.41	0.97	0.04	0.36	0.40

**Field B: Prospect - Tuber Quality**

Treatment	% Scab	Scab Severity	% Rhizoc	% Silver Scurf
<b>Minuet</b>	0.48	0.35	5.94	0.81
<b>Control</b>	0.29	0.21	5.53	1.07
<b>Difference</b>	0.19	0.14	0.41	-0.26
<b>p value</b>	0.439	0.286	0.653	0.438

In Field B, there was again no significant differences observed for yield and size profile variables. There were also no observed differences in percent scab, scab severity, percent Rhizoctonia black scurf, and percent silver scurf. Field B was geographically close to Field A, and neither field had much evident scab or tuber quality issues.

**Field C: Prospect - Yield and Size Profile:**

Treatment	Total Yield	Smalls	>10 oz.	Off Type/Culls	Marketable Yield
	cwt/ac.	%			cwt/ac.
<b>Minuet</b>	336.8	3.2	34.1	3.2	315.9
<b>Control</b>	319.8	2.8	33.9	2.8	302.3
<b>Difference</b>	17.0	0.4	0.2	0.4	13.6
<b>p value</b>	0.55	0.73	0.98	0.76	0.67

No scab severity ratings were performed for this field, as no common scab was observed during grading for either the control or Minuet treatments. There was no significant difference in yield or size variables in this field.

**Field D: Alverstone Russet - Yield and Size Profile:**

Treatment	Total Yield	Smalls	>10 oz.	Off Type/Culls	Marketable Yield
	cwt/ac.	%			cwt/ac.
<b>Minuet</b>	464.4	6.5	7.9	0	433.8
<b>Control</b>	453.0	12.3	3.7	0.4	395.3
<b>Difference</b>	11.4	-5.8	4.2	-0.4	38.5
<b>p value</b>	0.73	0.002	0.07	0.36	0.22

**Field D: Alverstone Russet - Tuber Quality**

Treatment	% Scab	Scab Severity	% Rhizoc	% Silver Scurf
<b>Minuet</b>	0.11	0.11	0.12	2.63
<b>Control</b>	0.41	0.29	0.06	2.52
<b>Difference</b>	-0.30	-0.18	0.06	0.11
<b>p value</b>	0.002	0.001	0.322	0.885

There was no significant difference in total or Canada #1 yield for Field D. There was a significantly lower percentage of small potatoes in this field and a higher percentage of potatoes over 10 ounces, contributing to a slightly larger difference in marketable yield than total yield (though still statistically non-significant).

There were significant improvements in percentage scab and scab severity in the Minuet treatment compared to the control treatment. However, in a similar fashion to Field A, the percentage of scab and scab severity in these fields is quite low in both treatments. There was no difference observed in percentage Rhizoctonia black scurf or silver scurf in this trial.

**Field E: Ranger Russet - Yield and Size Profile:**

Treatment	Total Yield	Smalls	>10 oz.	Off Type/Culls	Unmarketable Scab	Marketable Yield
	cwt/ac.	%				cwt/ac.
<b>Minuet</b>	306.3	4.8	10.4	2.8	11.5	248.5
<b>Control</b>	298.9	2.7	2.9	2.0	53.1	120.6
<b>Difference</b>	7.4	2.1	7.5	0.8	-41.6	127.9
<b>p value</b>	0.72	0.16	0.08	0.62	0.08	0.05

**Field E: Ranger Russet - Tuber Quality**

Treatment	% Scab	Scab Severity	% Rhizoc	% Silver Scurf
<b>Minuet</b>	13.39	1.85	2.81	0.67
<b>Control</b>	48.40	2.06	5.55	0.03
<b>Difference</b>	-35.01	-0.21	-2.74	0.64
<b>p value</b>	< 0.001	0.049	< 0.001	0.014

While there was no significant difference in total yield observed in this trial, the level of common scab in this field was substantial, with almost every tuber having some level of scab present. There was a very obvious difference in the number of tubers that were unmarketable due to scab between the two treatments, with the untreated control having more than 50 percent of yield unmarketable. This resulted in a very significant difference in marketable yield. Similarly to Field D, there was also a significantly greater number of tubers over 10 ounces in the Minuet treatment.

There was a very large decrease in percentage scab in favour of the Minuet treatment, reducing scab coverage per tuber by 72% compared to the control treatment. While there was a significant reduction in scab severity, the degree of reduction wasn't at the same level as the severity of scab symptoms was mostly similar between Minuet and control. There was also a significant reduction in Rhizoctonia black scurf (49%) in favour of Minuet, while there was a significantly higher level of silver scurf in the Minuet than in the control treatment.

#### Combined Yield Analysis – 5 Fields:

Treatment	Total Yield	Smalls	>10 oz.	Off Type/Culls	Unmarketable Scab	Marketable Yield
	cwt/ac.	%				cwt/ac.
<b>Minuet</b>	350.7	4.1	15.0	1.1	3.8	320.8
<b>Control</b>	340.8	4.8	8.1	0.8	17.7	264.8
<b>Difference</b>	9.9	-0.7	6.9	10.2	-13.9	56.0
<b>p value</b>	0.681	0.562	0.018	0.650	0.134	0.135

Similar to what we saw in this trial in 2023, there was no difference total yield between the Minuet and control treatments. There does appear to be a significant difference in percentage of 10 ounce or greater potatoes, with a 6.9% increase and a significant increase in three of five fields. The analysis for marketable yield is skewed significantly by the scab incidence from Field E; however, the amount of scab in just that one field resulted in a large difference in marketable yield and unmarketable scab percentage across the whole trial.

#### Combined Tuber Quality Analysis – 4 Fields:

Treatment	% Scab	Scab Severity	% Rhizoc	% Silver Scurf
<b>Minuet</b>	4.69	0.76	3.31	1.46
<b>Control</b>	16.31	0.81	5.26	1.35
<b>Difference</b>	-11.62	-0.05	-1.95	0.11
<b>p value</b>	< 0.001	0.508	< 0.001	0.654

Across four field trials, there was a significant reduction in percentage of common scab in the Minuet treatment compared with the non-treated control; however, there was not a corresponding reduction in scab severity. It should be noted that these results are heavily impacted by the results from Field E, but the positive reduction in scab was of such a magnitude that the effect was still highly significant across four field trials. There was also a significant reduction in the percentage of

Rhizoctonia black scurf symptoms in the Minuet treatment compared to the control, while no difference was observed in silver scurf symptoms.



### Key Findings:

- There was no observed increase in total yield between Minuet and control treatments.
- There was a significant increase in the percentage of ten-ounce tubers in favour of the Minuet treatment.
- In two of four trials with tubers analyzed for skin quality, there was a significant reduction in the percentage of scab in the Minuet treatment compared to the control treatment. In one trial, the Minuet treatment had significantly higher scab than control. In three of four trials where scab symptoms were scored, the average percent scab was under one percent with the majority of tubers scoring zero for percent scab or scab severity.
- There were significantly less black scurf (Rhizoctonia) symptoms across all Minuet samples compared to the control treatment, with statistically significant reductions in two of four individual fields in 2024.
- For the field with very noticeable scab pressure, the reduction in scab symptoms for the Minuet treatment compared to the control treatment was 72%. This is similar in magnitude to the reductions observed in two of three field trials in 2023, where reductions of 64% and 61% were found.
- Based on these two years of field trials using varieties susceptible to common scab, there appears to be a trend toward the reduction in common scab symptoms in favour of Minuet.

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