

AIM Seed & Tuber Quality Projects 2023

Ryan Barrett, P. Ag., CCA
Prince Edward Island Potato Board



Minuet for Common Scab Reduction

- Minuet – New formulation of Serenade Soil
- In-furrow biological fungicide
- Protection against Rhizoctonia, activity against Pythium, pink rot, and Fusarium root rot
- Preliminary research in Manitoba as part of common scab Cluster project showed some potential reduction in common scab incidence.



Minuet for Common Scab Reduction

- 3 field trials through AIM in 2023:
 - Hilltop Produce – Ranger Russet
 - MacLennan Properties – Ranger Russet (seed)
 - MacSull Farms – Kennebec
- Split field trial – 10 acres with Minuet, 10 or more acres with control
- No other changes to fungicide program
- Harvest samples, graded for yield and tuber skin blemishes

MP – Ranger Russet

Results for MacLennan Properties:

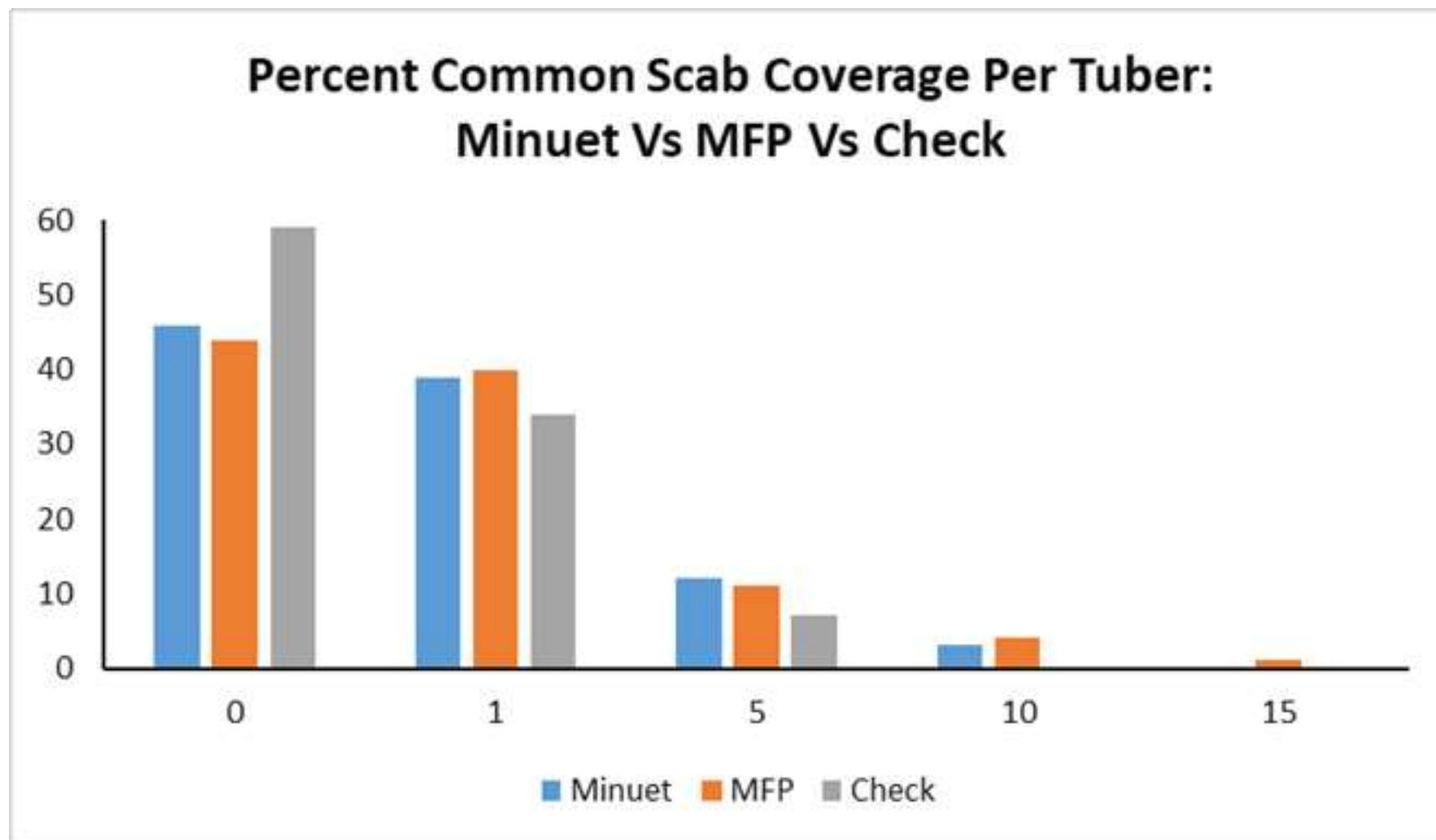
Grading:

Treatment	Smalls cwt/ac	Canada #1 cwt/ac	> 10 oz cwt/ac	Off-Type/Culls cwt/ac	Total Yield cwt/ac
Check	75.2	111.2	0.0	3.5	189.8
Microflora Pro	63.3	149.9	2.4	1.2	216.9
Minuet	74.2	120.7	0	0	194.9
p value	0.72	0.36	0.41	0.25	0.32

Tuber Blemishes:

Treatment	% Scab	Scab Severity	% <u>Rhizoctonia</u>	% Silver Scurf
Check	0.7	0.5	0.01	1.5
Microflora Pro	1.5	0.6	0.1	2.9
Minuet	1.9	0.6	0.2	0.9
p value	0.02	0.40	0.004	<0.001

MP – Ranger Russet



Hilltop – Ranger Russet

Hilltop Produce:

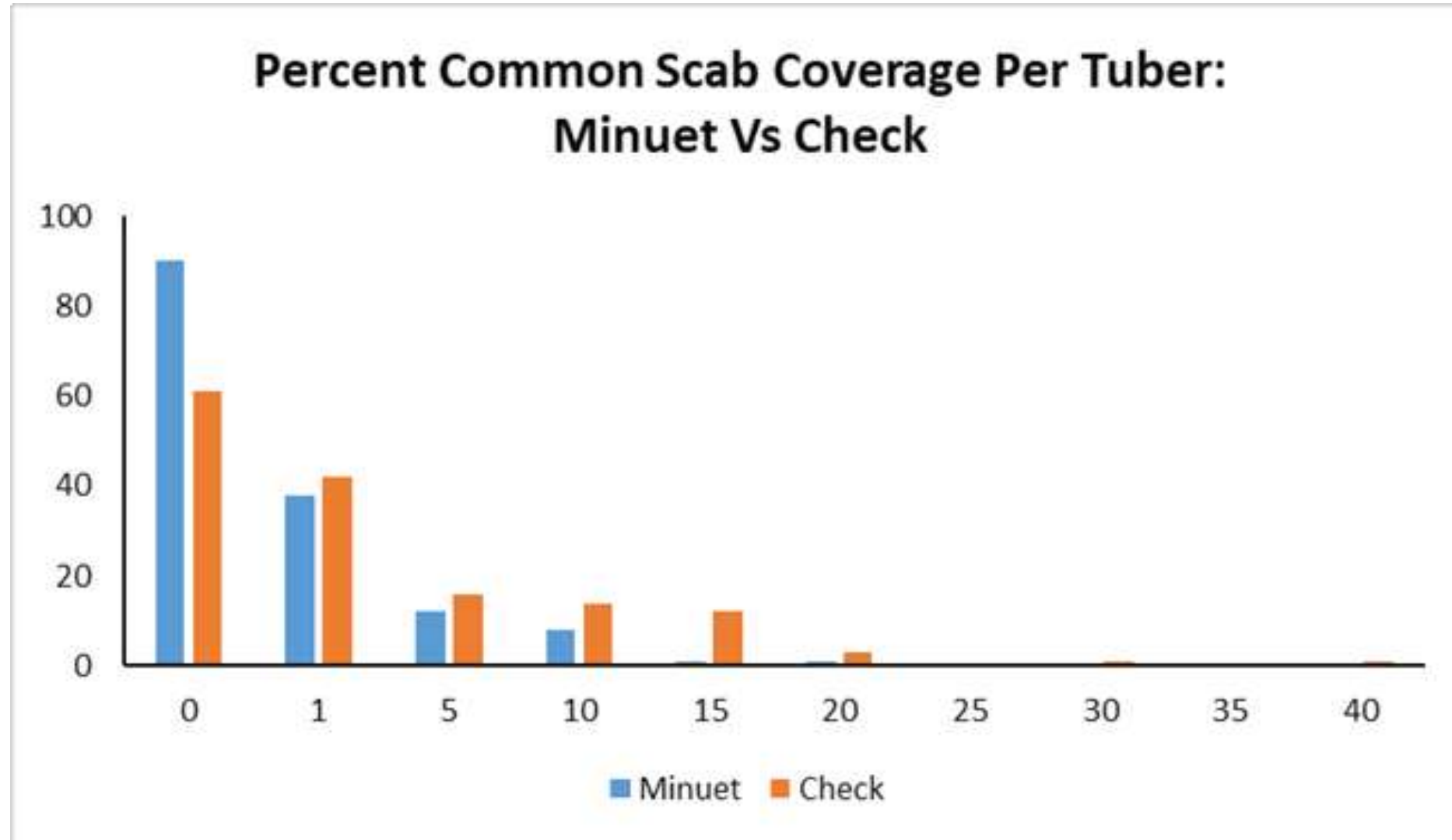
Grading:

Treatment	Smalls cwt/ac	Canada #1 cwt/ac	> 10 <u>oz</u> cwt/ac	Off-Type/Culls cwt/ac	Total Yield cwt/ac	Market. Yield cwt/ac
Check	18.3	209.8	81.5	5.7	315.3	291.3
Minuet	15.2	169.7	108.4	7.6	300.9	278.1
Difference	-3.1	-40.1	26.9	1.9	-14.4	-13.2
p value	0.55	0.17	0.29	0.71	0.41	0.48

Tuber Blemishes:

Treatment	% Scab	Scab Severity	% <u>Rhizoctonia</u>	% Silver Scurf
Check	3.6	0.7	0	5.8
Minuet	1.4	0.5	0.5	6.6
Difference	-2.2	-0.2	0.5	0.8
p value	<0.001	0.002	0.178	0.382

Hilltop – Ranger Russet



MacSull – Kennebec

Results for MacSull Farms:

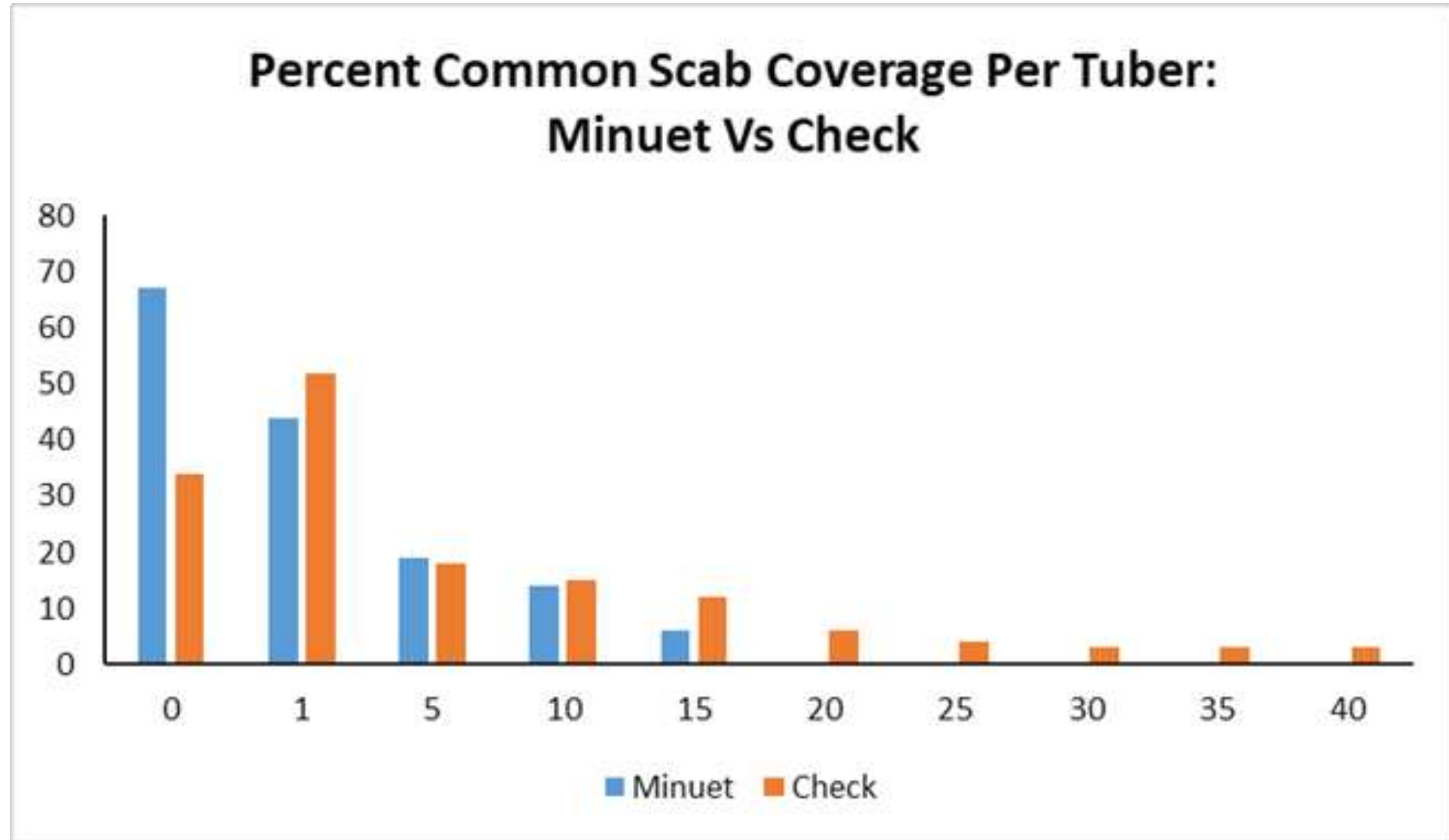
Grading:

Treatment	Smalls cwt/ac	Canada #1 cwt/ac	> 10 <u>oz</u> cwt/ac	Off-Type/Culls cwt/ac	Total Yield cwt/ac	Market. Yield cwt/ac
Check	8.5	208.1	35.7	24.3	276.5	243.7
Minuet	10.6	205.8	50.4	27.9	294.6	256.2
Difference	2.1	-2.3	14.7	3.6	18.1	12.5
p value	0.55	0.88	0.31	0.72	0.19	0.44

Tuber Blemishes:

Treatment	% Scab	Scab Severity	% <u>Rhizoctonia</u>	% Silver Scurf
Check	6.6	1.2	1.5	21.1
Minuet	2.4	0.8	2.3	19.4
Difference	-4.2	-0.4	0.8	-1.7
p value	<0.001	<0.001	0.003	0.395

MacSull – Kennebec



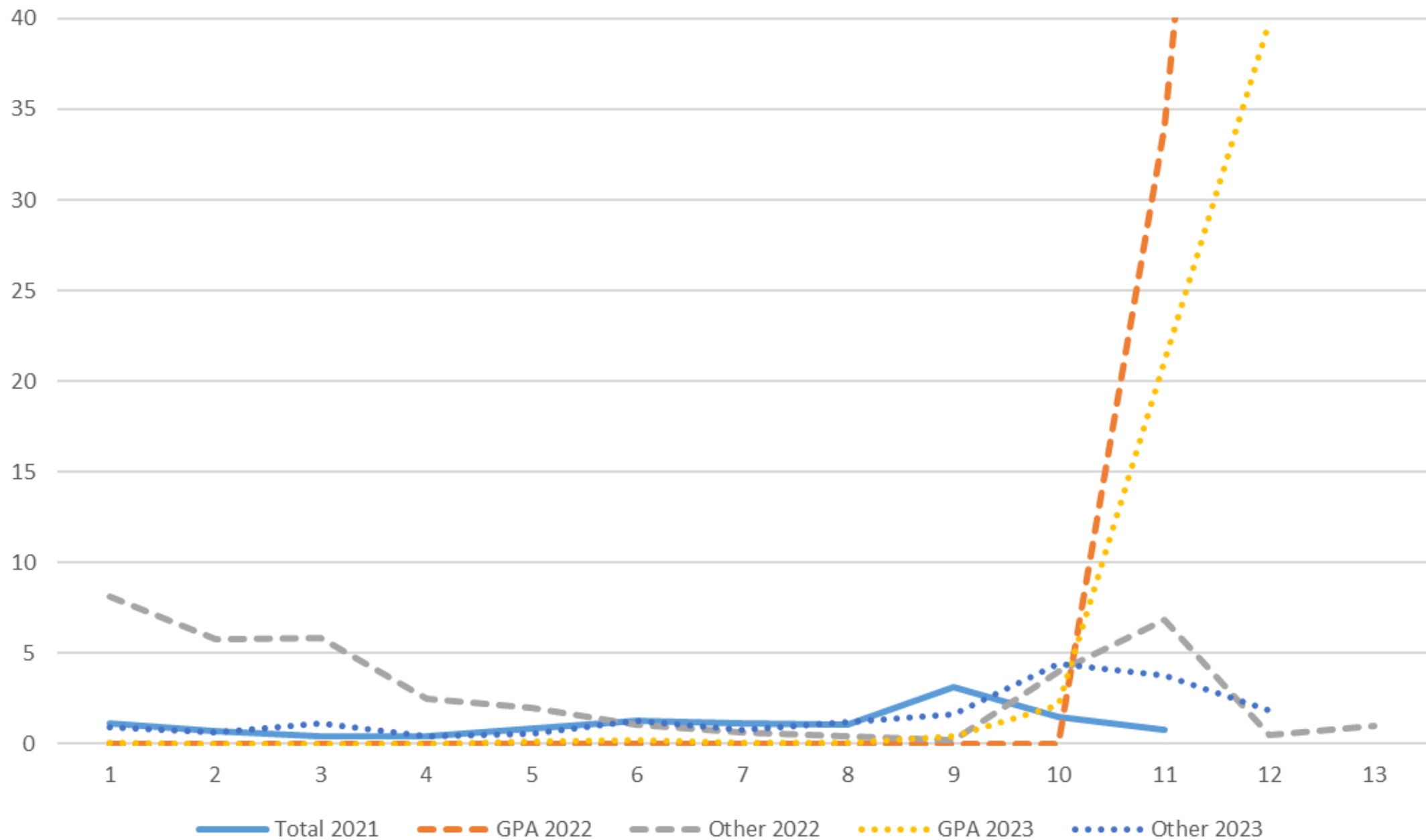
Minuet: Observations from 1st year

- Similar level of reduction at two farms (approx. 60% reduction)
- No difference in yield
- Not the same response at 3rd farm, but lowest average level of scab
- Awaiting results on plot scale at AAFC Harrington and Cavendish Farms
- Plan to do 3-4 field scale trials in 2024 on susceptible varieties
 - Prospect
 - Alverstone
 - Ranger

Aphid Resistance to Insecticides

- In 2015/2016, ACS Lab (NB) showed that there was indications of resistance to pyrethroid insecticides in Green Peach Aphids
- 2019-2021: low numbers of GPA, high pass rates for seed
- 2022: Lots of GPA, coming in earlier than normal. High PVY % in seed
- AIM Seed WG got access to aphid samples saved from 2022 Aphid Alert Program to test DNA for mutations related to insecticide resistance.
- 2023 – first GPA found week of July 23rd, peak Sept 10th

Aphids per Trap - PEI Aphid Alert Program 2021-2023

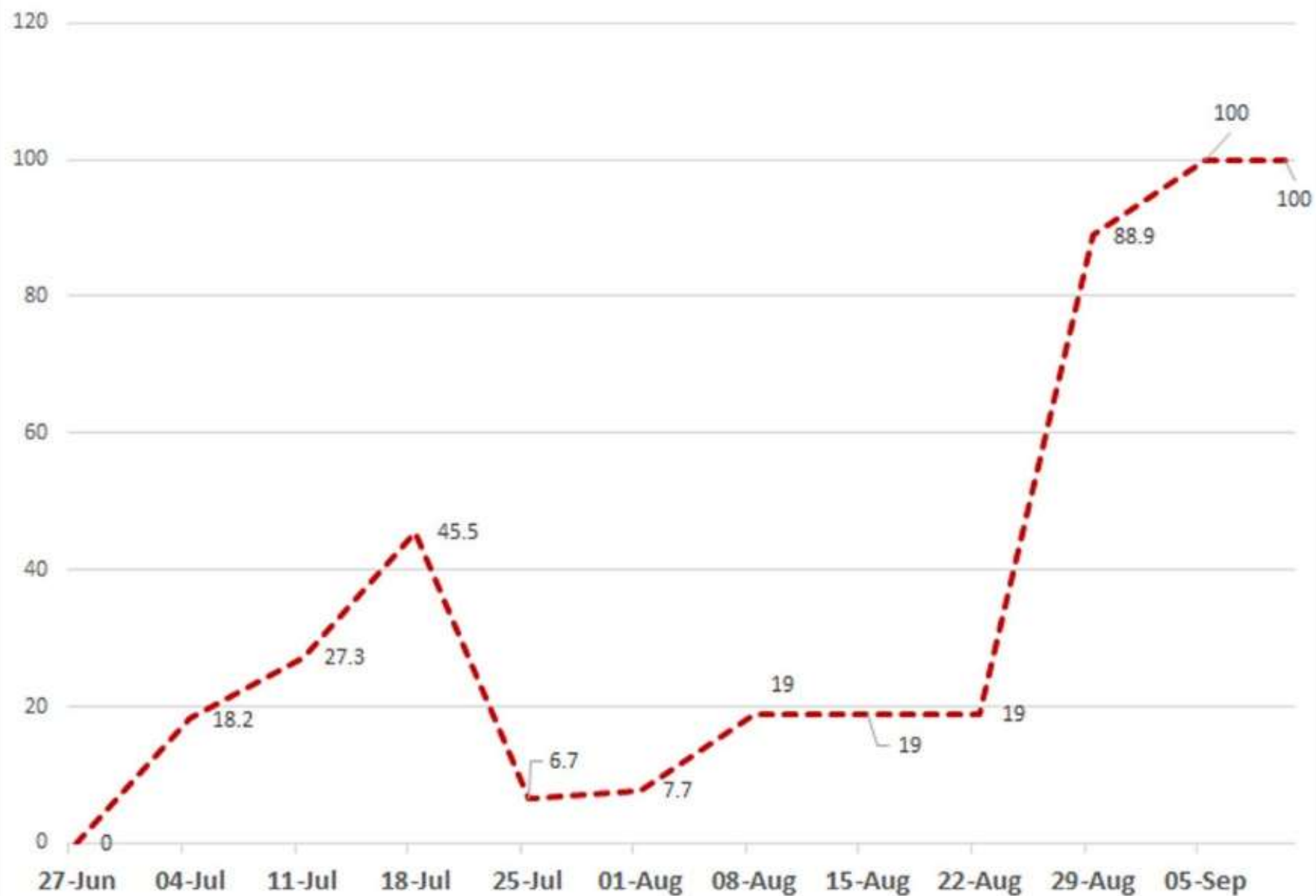


Aphid Resistance to Insecticides

- Tested approx. 20 aphids per week over the length of the growing season.
- 46% of total aphids had at least one resistance marker
- 100% of aphids in last two weeks were resistant
- 94% of positive aphids were Green Peach aphid



Pyrethroid Resistance Rate by Week - PEI 2022 Aphid Alert



Resistant Aphids: Summary

- Green Peach Aphids are essentially 100% resistant to the following insecticides:



Pounce
Perm-Up
Ambush



Resistant Aphids: Summary

- Pyrethroid (Group 3) aphicides should not be used after mid-July when GPA start to show up.
- Ensure a mix of chemistries through the season to avoid resistance and maximize control

Group 4:

Clutch

Closer

Cormoran

Assail WP

Sivanto Prime

Group 29:

Beleaf

Group 23:

Movento

Group 9D:

Sefina

Group 28:

Vayego

*suppression

Resistant Aphids: Summary

- Peak of Green Peach Aphids hits the last week of August/first week of September.
- Consider having your seed crop top-killed at this time. In NB, this was highly correlated with lower PVY %
- If top-killing the last week of August, we need to:
 - Plant earlier
 - Reduce Nitrogen

Reduced N Rate – Seed

- AIM trials looking at reduced N rates on seed
- We want seed to mature more quickly as it will be top-killed earlier. We also want higher tuber numbers, fewer large tubers (less cutting)
- No yield penalty by decreasing N on seed. In some trials, increased tuber numbers and/or increased yield. In 13 trials over 4 years, no average difference in yield with 20-30% reduced total N applied.

Reduced N – 2023 Trials

- West Prince: Mountain Gem and Targhee Russet
 - Grower Standard 100 lbs/ac, Treatment 70 lbs/ac
 - Planted May 20-23. Topkill Sept 1 (MG) and Sept 7 (TR)
 - No difference in yield, no difference in residual nitrate
 - Slight trend toward reduced yield and tubers in Targhee at 70 lbs/ac
 - Optimum likely to be somewhere in this range

Reduced N – 2023 Trials

- East Prince: Mountain Gem
 - Grower Standard 150 lbs/ac, Treatment 113 lbs/ac
 - Planted May 30. Topkill Aug 29
 - Significant difference in yield, with Low N (260 cwt/ac) higher yield than GSP N (246 cwt/ac)
 - Significantly higher residual nitrate in GSP N (15 ppm) than Low N (10 ppm)
 - Plants were still rank green at top kill

Reduced N Rate - Seed

Variety	GSP N lbs/ac	GSP Tubers #/10 ft	GSP Yield cwt/ac	Low N lbs/ac	Low N Tubers #/10 ft	Low N Yield cwt/ac
Burbank 2019	150	87	287	120	106	294
Shepody 2019	136	66	283	114	70	262
Burbank 2019	168	99	271	128	98	308
Shepody 2020	135	64	294	100	69	331
Burbank 2020	165	127	407	120	130	413
Payette 2020	165	78	295	120	76	294
M Gem 2020	165	86	310	120	75	311
Dakota 2022	177	92	340	145	91	347
Dakota 2022	100	65	274	80	69	292
Alverstone 2022	100	90	399	80	89	394
M Gem 2023	150	49	246	118	56	260
M Gem 2023	100	71	274	70	67	269
Targhee 2023	100	66	253	70	58	241
AVERAGE		80	303		81	309

PVY Detection using Artificial Intelligence



Nicole Mortillaro · CBC News · Posted: Jan 27, 2024 5:00 AM AST | Last Updated: January 27



The University of Prince Edward Island's AgriRobot is shown in a potato field. In trying to mitigate and adapt to climate change, artificial intelligence is being used in such areas as agriculture, early warning systems and wildfire predictions. But AI produces its own emissions. (University of Prince Edward Island)

1st Year of Project
Trained on more than
80,000 images
**75% accuracy on field
scale in first year**

More info at Potato Expo

<https://www.cbc.ca/news/science/ai-climate-change-emissions-1.7094616>

CEU QR code

**2.5 CEUs –
Crop Management**

**or, send your CCA number
to ryan@peipotato.org**



Upcoming Workshop:

- Feb 27th/28th: Reduced Tillage/Precision Ag with Chad Berry, Manitoba
 - Feb 27th: Emerald AM, Fox Island PM
 - Feb 28th: Montague AM



Acknowledgements:

AIM Funding Partners:



Agriculture and
Agri-Food Canada

Agriculture et
Agroalimentaire Canada

Conference Schedule - Day 1

www.PotatoExpo.ca



CONFERENCE SCHEDULE	
THURSDAY, February 22, 2024 <i>Presented by: United Potato Growers of Canada</i>	
8:00 am	Registration Opens
8:40 am	Welcome from the PEIPB/PEI Department of Agriculture
8:45 am	Canadian Potato Market Update - <i>Victoria Stamper, UPGC</i>
9:15 am	USA Potato Market Update - <i>Mark Klompfen, UPGA (video)</i>
9:45 am	Recognition of UPGC Sponsors
10:15 am	Coffee Break
10:30 am	Trends in the Agricultural Economy - <i>Leigh Anderson, FCC</i>
11:15 am	Attracting and Retaining Employees in Agriculture - Panel: <i>Krista Prescott, Sally Ripley, Laurie Loane</i>
2.5 CEUs available (PD) for CCAs	



POTATO GROWERS OF CANADA
LES PRODUCTEURS UNIS DE POMMES DE TERRE DU CANADA



Victoria Stamper, UPGC



Mark Klompfen, UPGA



Leigh Anderson, FCC



Krista Prescott



Sally Ripley

Conference Schedule – Day 2

www.PotatoExpo.ca



FRIDAY, February 23, 2024

Presented by: PEI Potato Board and PEI Dept of Agriculture



8:00 am Registration Opens

8:45 am Welcome from the PEIPB/PEI Department of Agriculture

9:00 am Managing Foliar Fungicides in High Pressure Year
- Darin Gibson, Gaia Consulting, MB



Darin Gibson
Gaia Consulting, MB

9:30 am Combatting Resistance in Colorado Potato Beetles
- Tracy Shinnars-Carnelly, Peak of the Market, MB



Tracy Shinnars-Carnelly
Peak of the Market, MB

10:15 am Coffee Break

10:45 am Looking for the Lowing-Hanging Fruit from Digital Agriculture
- Alex Melnitchouk, IntelMax Corp, AB*



Alex Melnitchouk
IntelMax Corp, AB*

Sponsored by:  Agriculture and Agri-Food Canada Agriculture et Agroalimentaire Canada

11:30 am Precision Agriculture Research Update - Aitazaz Farooque, UPEI



Aitazaz Farooque, UPEI

2.5 CEUs available (IPM, CM, SW) for CCAs

Register Today – Promo Code IPT2039
Convenient registration available at www.PotatoExpo.ca




Thank You!

Ryan Barrett, P. Ag., CCA-AP

Research & Agronomy Specialist, PEI Potato Board

Email: ryan@peipotato.org

 @rbarrettPEI

www.peipotatoagronomy.com

