



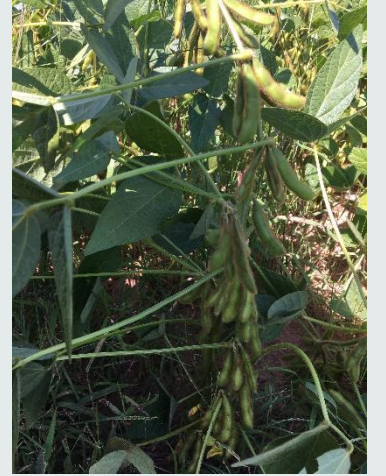
ECODA CAP AgriScience Project:

*Eastern Oilseeds: Innovation to
Maximize Competitiveness and
Sustainability*



Commodity Focus for 2018-2023 ECODA CAP

- **Canola:** resistance development, agronomics, potato rotation
- **Soybeans :** Non-GM IP market diversification and improved performance
- **Peas/mustard:** intercropping, potato rotation
- **Camelina:** intercropping, potato rotation, double cropping, germplasm evaluation
- **Hemp*:** agronomics and variety evaluation
- **Aquafeed:** plant-based products for diet inclusion



Industry Partners are Key



W.A. Grain &
Pulse Solutions

- Must have commercial viability
- Market evaluation annually
- Industry support through contributions (cash and in-kind) and review



Canola- Potato Rotation

Environmental and Economic Impact of Canola in Potato Rotation in Eastern Canada

Aaron Mills, Judith Nyiraneza, Tandra Fraser AAFC-Charlottetown

Objectives:

- Agronomy: cover crop compatibility for each cropping system; effects of fall plow vs. winter cover crop; yield components and agronomic metrics of all crops in all rotations; disease effects on all crops including potato
- Nutrient management: N credits from different cover crops; N use efficiency; Soil enzyme activities associated with C, N, and P cycling
- Soil health: Nutrient ratio in the whole soil and microbial biomass; Soil aggregate stability and particulate organic matter during potato phase; Assess the effects of Brassicas on mycorrhizal colonization of subsequent crops; Evaluate mycorrhizal inoculant application to improve potato yield and quality

Canola- Potato Rotation

Cropping Systems Implemented:

Rotaton	2017		2018		2019	2020		2021		2022
	Main crop	Cover crop	Main crop	Cover crop	Main crop	Main crop	Cover crop	Main crop	Cover crop	Main crop
1	barley	red clover u/s	red clover	red clover	potato	barley	red clover u/s	red clover	red clover	potato
2	canola/pea	winter wheat	winter wheat	red clover	potato	canola/pea	winter wheat	winter wheat	red clover	potato
3	soybean	ryegrass o/s	corn	ryegrass o/s	potato	soybean	ryegrass o/s	corn	ryegrass o/s	potato
4	canola	cereal rye	pea	cereal rye	potato	canola	cereal rye	pea	cereal rye	potato
5	canola	red clover	corn	ryegrass o/s	potato	canola	red clover	corn	ryegrass o/s	potato
6	soybean	mustard	corn	ryegrass o/s	potato	soybean	mustard	corn	ryegrass o/s	potato
7	pea	cereal rye	canola	cereal rye	potato	pea	cereal rye	canola	cereal rye	potato
8	corn	ryegrass o/s	canola	cereal rye	potato	corn	ryegrass o/s	canola	cereal rye	potato
9	canola	winter wheat	winter wheat	red clover o/s	potato	canola	winter wheat	winter wheat	red clover o/s	potato
10	pea	winter wheat	winter wheat	red clover o/s	potato	pea	winter wheat	winter wheat	red clover o/s	potato

o/s = overseeded

u/s = underseeded

Mustard/Potato Research

Enhancing Profits and Sustainability in potato rotations using brown mustard for soil health and export grain production - Steve Howatt & Aaron Mills

Objectives

- Determine effect of mustard grown for grain vs. green incorporation on wireworm reduction and subsequent potato tuber yield and quality
- Create predictive model of yield and economic return for a potato rotation with both options.
- Quantify the economic and environmental return of a rotation with grain vs. plow down



Mustard/Potato Research

Year 1: Mustard Year

3 strips (in field)

- 1) mustard allowed to mature for grain harvest
- 2) mustard plowed down at peak flowering prior to full seed development
- 3) a check treatment of spring cereal (barley, wheat, oats or mixed grain).

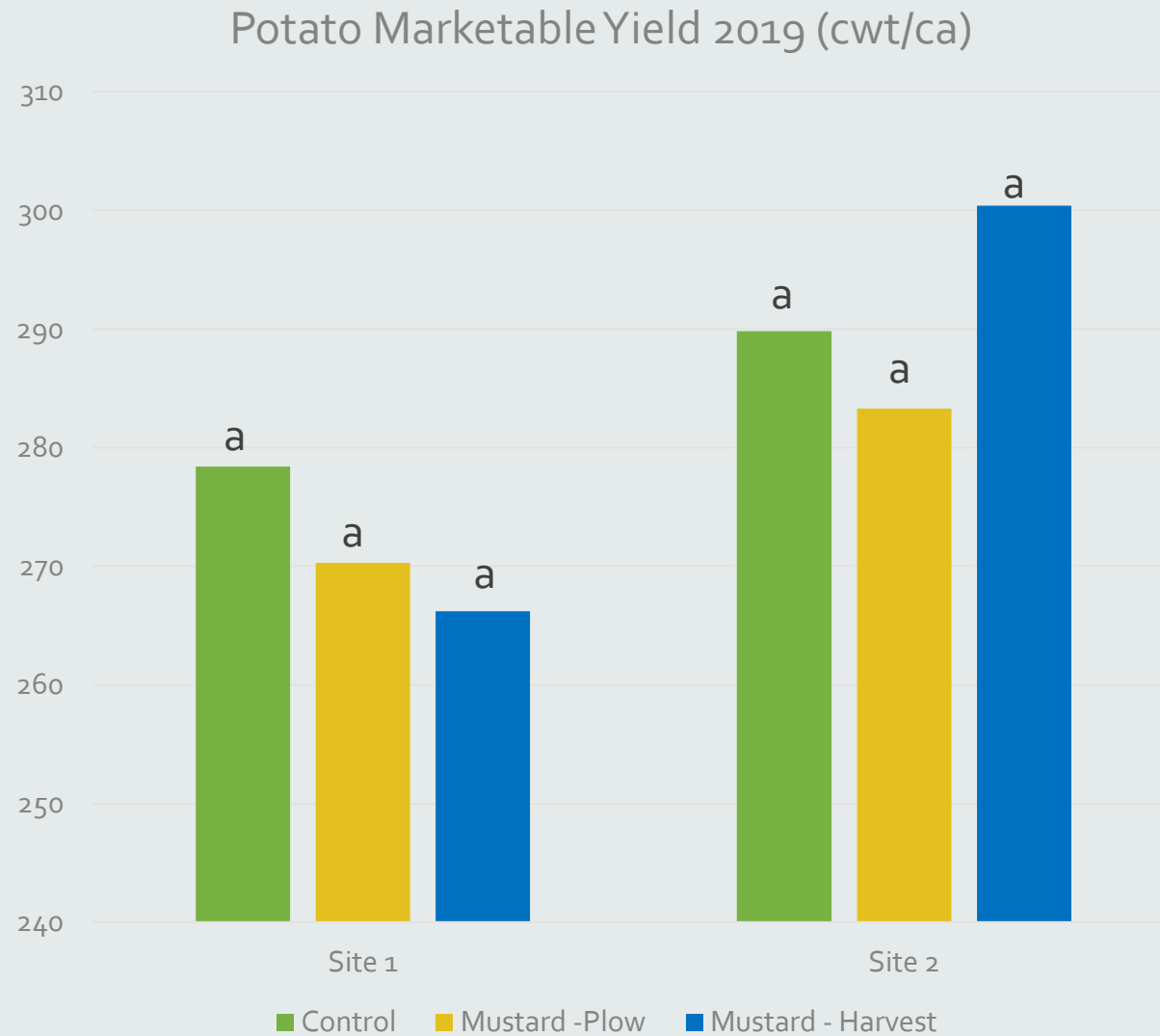
Year 2: Potato Crop Survey

Harvest 1m sections to assess tuber yield and quality

Cycle 1 completed....looking for cooperators for next cycle (2020-2022)

2019 Potato Data (PEI)

No significant difference *



Intercropping

Improving soil health and land-use efficiency through intercrops with pulses - Claude Caldwell and Aaron Mills

Objective: Determine variation in intercrop performance of two brassica species with peas evaluating soil health and LER as determinants for performance.

- Determine the effect of brassica: pea intercrops on soil health.
- Evaluate the relative benefits of brown mustard and camelina as companion crops for peas.
- Determine the best intercrop ratio to obtain optimum Land Equivalent Ratio (LER) for oil, protein and per hectare profitability.

Previous Trial Data (2017/18)

- Higher pod height in pea:camelina intercrop vs monocrop
- Brassica hold up peas reducing rates of lodging
- LER consistently over 1 = higher return per acre with intercrop (1.04 – 1.14)
- No significant impact on pea protein with various seeding rates

Intercrop Data

(*Sask data: https://saskpulse.com/files/newsletters/18o6o6_Intercropping_pulses_with_mustard.pdf)

Crop Type	Pea Yield (kg/ha.)	Brassica Yield (kg/ha)	LER
Yellow Peas (mono)*	3746 (b)	-	1.00
Yellow Pea + brown mustard*	4634 (a)	95	1.33
Green Peas (mono)*	4560 (a)	-	1.00
Green Peas + brown mustard*	4250 (ab)	140	1.08
2017 NS Data			
Green Pea (mono)	4300 (a)		1.00
Green Pea + camelina	3600 (b)	480	1.15

Intercrop Data

(*Sask data: https://saskpulse.com/files/newsletters/18o6o6_Intercropping_pulses_with_mustard.pdf)

Crop Type	Seed + N Cost (\$/ac)	Net Return (\$/ac)
Yellow Peas (mono)*	\$67.28	\$322.30
Yellow Pea + brown mustard*	\$71.82	\$444.02
Green Peas (mono)*	\$90.96	\$485.50
Green Peas + brown mustard*	\$88.32	\$497.58

2018 Data Based on Yellow Pea \$7/bu, Green Pea \$8.50/bu and Brown Mustard \$0.35/lb

Camelina

Evaluation of diverse camelina germplasm to enhance profits and sustainability in Eastern Canadian rotations - Claude Caldwell and Steve Howatt

Objectives:

- Assess if producers can use a short season (< 80 day), high quality camelina type to follow winter wheat and produce a double crop economically and sustainably.
- Determine bio fumigation effectiveness of a long season (160 day), high glucosinolate lines of camelina as a plough-down in a potato rotation.
- Evaluate how a potato rotation with camelina for seed compare to the traditional mustard plough-down both in economic and environmental terms.





Short Season Camelina (<80 days)

NOV. 6, 2019



Short Season Camelina

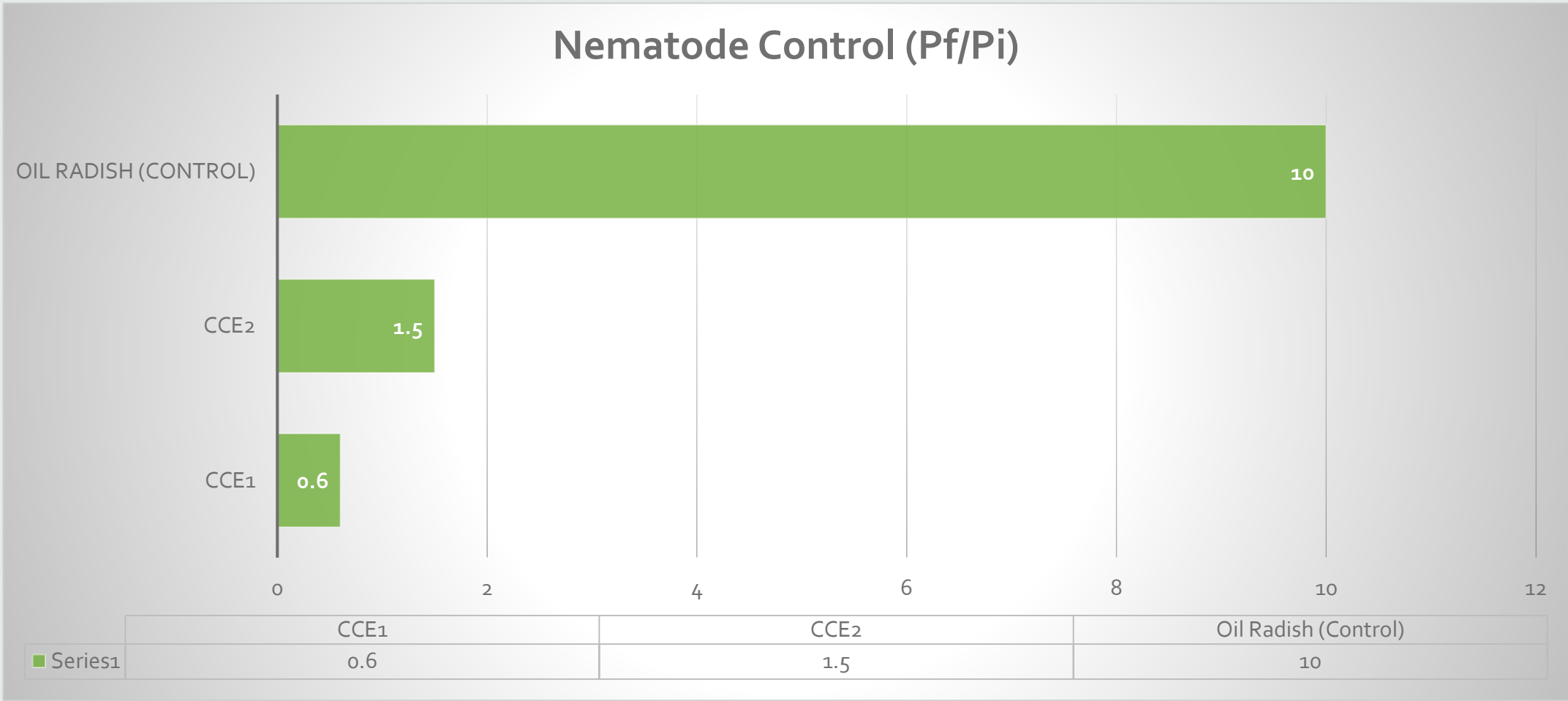
DEC. 2, 2019



Long Season Camelina (>160 days)



Camelina Nematode Control



Opportunities to Learn More

Social Media Platforms

- Twitter: @CanadaOilseeds
- Instagram: easterncanadaoilseeds
- Webpage: www.ecodainc.ca
- YouTube

Grower Days: summer/fall 2020-2022