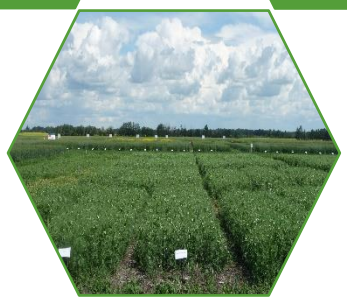
Gateway Research Organization

2016 ANNUAL REPORT

Cropping

Forage & Livestock

Enviroment



Contents

Chairperson's Report

Chelsea Pellerin

Greetings!

On behalf of the Board of Directors at Gateway Research Organization, I would like to recognize our membership, partners, and supporters including Westlock County, Barrhead County, and Parkland County. We hope this support continues to grow and thrive in the coming year!

First of all, welcome to 2017! 2016 was an interesting year indeed, with an unusually warm and dry spring followed by an even more unusual cold and wet fall. We all persisted and we've made it to the New Year. Let us hope for better luck this year! GRO has some exciting things coming up in 2017, including numerous events with great speakers – please make sure to mark your calendars! As always, we are open to even more great ideas for events and trials so if you have an idea that's been pestering you and you'd like GRO to research it, let us know!

Again, thank you for your continued support. It is for you, our membership that we do the work that we do. So stay connected, stay enthused, and most importantly, keep 'GRO'ing!

Manager's Report

Sandeep Nain

I completed my first year at GRO and I am proud to be part of such a wonderful organization. First of all, I would like to thank all of the members of our organization for their support. The work we do truly would not be possible without the support of local producers who believe in the value that applied research associations provide to the industry.

Weather has been an obstacle for many of the producers in our area. We saw higher precipitation than normal with high winds, as well as many rain events especially hampering work during harvest season. We had very dry and bit late start for our seeding. However, much needed rain came and we had beautiful looking site and a well-attended crop walk. This would have not been possible without the help from Anne van loon and Mairi McEwen.
The best compliment of the season for me arrived with blessing in form of baby boy, Viaan.

A special thanks to Jubilee Feedlot, Greg Thompson and Ken Anderson, who spent much of their time and expertise helping us with our trails. Many thanks to Westlock, Barrhead, Woodlands and Parkland Counties for their continued support with our trials and demonstrations. We are always searching for fresh ideas to put into action. I would encourage our members and collaborators to come up with suggestions for demonstrations or research trials, we will try to best of our ability to accommodate the request.

An extra special thanks to **Rick Tarasiuk** for the wonderful work done over the year. He was instrumental in all the work done and success of our trial in summer season.

Please visit our website www.gatewayresearchorganization.com for most recent updates and activities from GRO.

2016 Report from ARECA

Ian Murray, Chair

2016 was a good year for ARECA. We worked with our 9 members associations to deliver programs across the province.

RVTs: 5 of our member associations delivered pea, wheat, barley, oats and flax Regional Variety Trials on 22 sites across the province. Yield data is collected and distributed in the Alberta Seed Guide.

Pest Monitoring: As in the past, 6 of our associations worked with AAF to monitor insect infestations across the province. We monitored 8 insect pests in 260 field visits over the summer and submitted the data for inclusion in the Alberta Insect Pest Monitoring Network releases.

We launched a new website in 2016. It is cleaner, leaner, and is full of information about programs delivered by our member associations (www.areca.ab.ca).

Connections Newsletter: We created and distributed 9 newsletters with the intent of increasing the connection between our member association Boards. Each edition featured one member association. The newsletter is distributed internally to all association Board members.

Janette McDonald, Executive Director

Environmental Farm Plan: In 2016, we introduced the Web 3.0 edition of the EFP. As well, ARECA was instrumental in leading a movement to a national EFP. We hope to move this plan further in 2017. Late in 2016, we started preparing the Alberta EFP 5-year Business Plan for 2018-2023.

Sustainable Sourcing: ARECA was awarded Green Intern funding in 2016 and our intern has completed an excellent summary of potential global sustainability requirements and how those requirements will impact Alberta farmers.

Governance: In 2016, the ARECA Board spent time developing sound processes around how projects are approved and managed within ARECA and between ARECA and our members. Our new processes have resulted in successful programs and co-operation between our members.

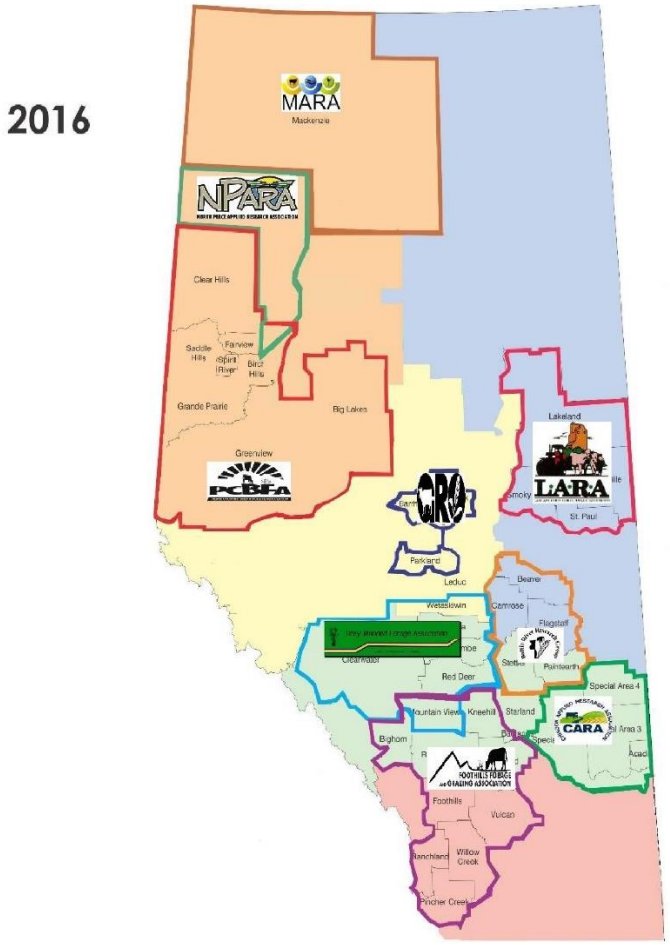
Sainfoin Pasture: All associations are collaborating with ARECA and Alberta Agriculture and Forestry (AAF) on a province-wide sainfoin pasture project. We established 10 sites and will be measuring plant health and grazing yield in 2017.

Blackleg Surveillance: ARECA and 7 associations co-operated with AAF to collect and submit samples from 171 canola fields across the province. This project is a significant benefit to canola producers and we have the opportunity to expand it in 2017 and beyond.

Project Management Training: All ARECA associations and their staff manage projects. Project Management is a valued skill. Late in 2016, ARECA paid for training of 10 staff from 7 associations. This was an excellent course. If we work at what we learned, our projects will get better and better. Some staff comments:

> "We will be more organized and take less time to complete events or projects….Great course!"
> "Projects will be better understood and support more buy –in."
> "This was one of the best training workshops I have ever been to. "

Strategic Planning Conference: In November, ARECA hosted 35 association Board members at a conference in Lacombe. It was an excellent session and will lead to greater collaboration between our associations, government and industry in 2017.



2016-Board of Directors

GRO Directors and staff, l-r: Maurice Kruk (Vice-Chairman), Sandeep- Nain (General Manager), Tom MacMillan, Rusty Bellamy (Director), Chelsea Geiger (Chairperson), Ken Anderson (Director), Bryan Penno (Served 2 terms and retired), Keith Wiart (Director), Justin Nanninga (Director), Rick Tarasiuk (Crops Research Technician), Bill Visscher (Director). Missing from the photo, Steve Kenyon (Treasurer), and Janine Paly (Secretory).

Chelsea Geiger – Chairperson[$]
Box 35
Tawatinaw, AB T0G 2E0
780-307-6617

Janine Paly - Secretory
Box 778
Thorhild, AB, T0A 3J0
780-232-1987

Livestock and forage committee

Maurice Kruk - Vice Chairman[$]
Box 282
Radway, AB T0A 2V0
780-349-0589

Rusty Bellamy - Director
Box 1863
Athabasca, AB, T9S 2B5
780-689-7558

Steve Kenyon - Treasurer[$]
Box 188
Busby, AB, T0G 0H0
780-307-6500

Bill Visscher - Director
25312 TWP rd 554
Sturgeon County, AB, T8R 2G6
780-699-7627

Crop committee

Tom Macmillan - Director
NW5-58-26-W4; RR#2
Pickardville, AB, T0G 1W0
780-349-9415

Ken Anderson - Director
RR#1
Barrhead, AB, T7N 1N2
780-674-1941

Equipment committee

Keith Wiart - Director
NW6-62-2-W5
RR1
Barrhead, AB, T7N 1N2
780-307-1564

Justin Nanninga - Director
NW29-60-2-W5
RR1, Site 4, Box 11
Barrhead, AB, T7N 1N2
780-674-5343

Staff

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Westlock, AB, T7P 2P6
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grocrops@telus.net

Acknowledgement to Sponsor

Gateway Research Organization gratefully acknowledges the generous support of the following businesses, organizations and individuals for providing valuable support, products and/or services to us in 2015.

The Board of Directors and staff extend their sincere appreciation for the active support for our research programs.

Program Funding

Alberta Government
Westlock County growing opportunity
County of Barrhead
Parkland County
Woodlands County

Events Funding

Alberta Wheat Commission
Alberta Barley
Alberta Canola Producers Commission
Alberta Pulse Growers
Westlock Seed Cleaning Co-op Ltd.

In-Kind Contributors and Industry Partners in 2016

(Including a combination of goods, land, equipment, product, services, percentage markdowns, etc.)

Special thanks to "Jubilee Feedlot" Westlock for time and support in conducting trials.

- WESTLOCK SEED CLEANING CO-OP LTD
- Flatlander
- Agriculture and Agri-Food Canada
- Anderson Seed Growers
- Jonk Farms
- Rick's Pedigreed Seeds
- Forward Seed Farms
- FP Genetics
- Prairie Oat Growers Association

- A special thanks to Earth Smart Solutions

Gateway Research Organization

Our History

Gateway Research Organization was formed from consolidation with the Pembina Forage Association in 1994. The Pembina Forage Association was started in 1975 by local producers interested in pasture management and forage & livestock research. While maintaining its interest in forage & livestock issues, the new organization became more involved in applied research and demonstrations in crops and environmental sustainability.

Our Vision

Gateway Research Organization will be a renowned and respected agriculture research and extension organization that is the preferred source of unbiased farm production information.

Our Mission

Gateway Research Organization provides cost-effective applied agricultural research, demonstration, and extension for producers in order to facilitate greater returns to farms by providing economically and scientifically sound information that enables our clients to make informed decisions.

The Goals of our Organization

1. To increase the profitability of our members.
2. To encourage active participation by local producers.
3. To provide a valuable resource for information transfer and extension to producers.
4. To produce high quality, unbiased, and scientifically sound research.
5. To produce research based on local growing conditions and soil properties.
6. To collaborate with specialists from the agricultural industry, government, and educational institutions.

2016 Extension Activities (Crops)

GATEWAY RESEARCH ORGANIZATION
PO Box 5865, Westlock, Alberta T7P 2P6. 780-349-4546 or 780-249-1440

2016 GRO-AGM & Spring Fling

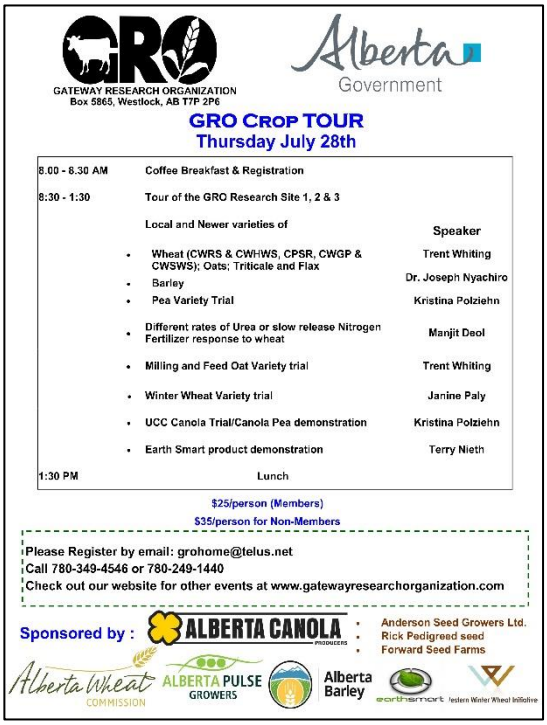
Venue: Hazel bluff Hall: AB-18, Alberta (780) 349-3377

Wednesday, February 24, 2016

8:30 am to 8:55 am	*Registration*
	AGENDA
8:55 am to 9:30 am	**Mike Hittinger**, *Growing Forward 2 Program update*
9:30 am to 10:05 am	**JP Pettyjohn**, *Lead Agronomist, Ray Agro & Petroleum ltd*
10:05 am to 10:15 am	*FCC Sponsored Coffee and Snacks Break*
10:15 am to 10:45 am	*Kevin Elmy, Cover Crop Canada*
10:45 am to 11:15 am	*James Jackson, Director - Alberta Pulse Grower*
11:15 am to 12:00 pm	*Peter Walsh, Instructor - Lakeland College*
12:00 pm to 1:30 pm	*Lunch and AGM*
1:30 pm to 2:10 pm	**Dr. Carolyn Fitzsimmons**, *Research Scientist, Agriculture and Agri-Food Canada*
2:10 pm to 3:05 pm	**Dr. Edward Bork**, *Professor - Matthias Chair, University of Alberta*
3:05 pm to 3:45 pm	**Grant Lastiwka, Livestock / Forage Business Specialist**

Gold Sponsor of the event

Bronze Sponsor of the event



GATEWAY RESEARCH ORGANIZATION
Box 5865, Westlock, AB T7P 2P6

Alberta Government

GRO CROP TOUR
Thursday July 28th

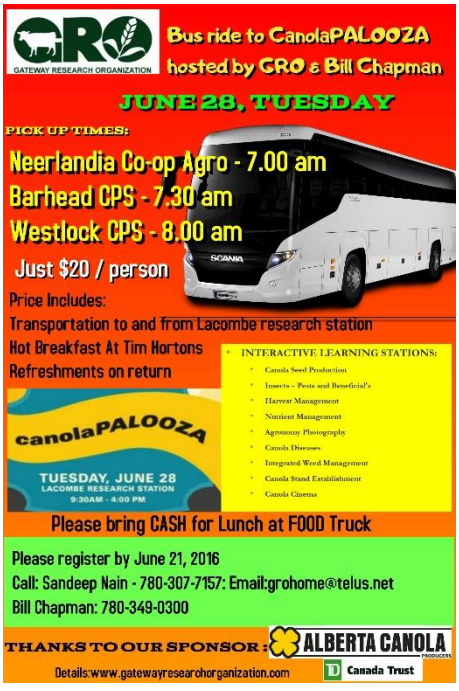
8.00 - 8.30 AM	Coffee Breakfast & Registration	
8:30 - 1:30	Tour of the GRO Research Site 1, 2 & 3	
	Local and Newer varieties of	Speaker
	• Wheat (CWRS & CWHWS, CPSR, CWGP & CWSWS); Oats; Triticale and Flax	Trent Whiting
	• Barley	Dr. Joseph Nyachiro
	• Pea Variety Trial	Kristina Polziehn
	• Different rates of Urea or slow release Nitrogen Fertilizer response to wheat	Manjit Deol
	• Milling and Feed Oat Variety trial	Trent Whiting
	• Winter Wheat Variety trial	Janine Paly
	• UCC Canola Trial/Canola Pea demonstration	Kristina Polziehn
	• Earth Smart product demonstration	Terry Nieth
1:30 PM	Lunch	

$25/person (Members)
$35/person for Non-Members

Please Register by email: grohome@telus.net
Call 780-349-4546 or 780-249-1440
Check out our website for other events at www.gatewayresearchorganization.com

Sponsored by : ALBERTA CANOLA PRODUCERS
- Anderson Seed Growers Ltd.
- Rick Pedigreed seed
- Forward Seed Farms

Alberta Wheat Commission · Alberta Pulse Growers · Alberta Barley · earthsmart · Western Winter Wheat Initiative



GATEWAY RESEARCH ORGANIZATION

Bus ride to CanolaPALOOZA hosted by GRO & Bill Chapman

JUNE 28, TUESDAY

PICK UP TIMES:

Neerlandia Co-op Agro - 7.00 am
Barhead CPS - 7.30 am
Westlock CPS - 8.00 am

Just $20 / person

Price Includes:
Transportation to and from Lacombe research station
Hot Breakfast At Tim Hortons
Refreshments on return

INTERACTIVE LEARNING STATIONS:
- Canola Seed Production
- Insects – Pests and Beneficial's
- Harvest Management
- Nutrient Management
- Agronomy Photography
- Canola Diseases
- Integrated Weed Management
- Canola Stand Establishment
- Canola Cinema

canolaPALOOZA
TUESDAY, JUNE 28
LACOMBE RESEARCH STATION
9:30AM - 4:00 PM

Please bring CASH for Lunch at FOOD Truck

Please register by June 21, 2016
Call: Sandeep Nain - 780-307-7157: Email:grohome@telus.net
Bill Chapman: 780-349-0300

THANKS TO OUR SPONSOR : ALBERTA CANOLA PRODUCERS

Details:www.gatewayresearchorganization.com · Canada Trust

2016 Extension Activities (Livestock)

Regional Cereal Variety Trials

Co-operators: Jubilee Feedlot – SW-15-59-3 W5

Objectives

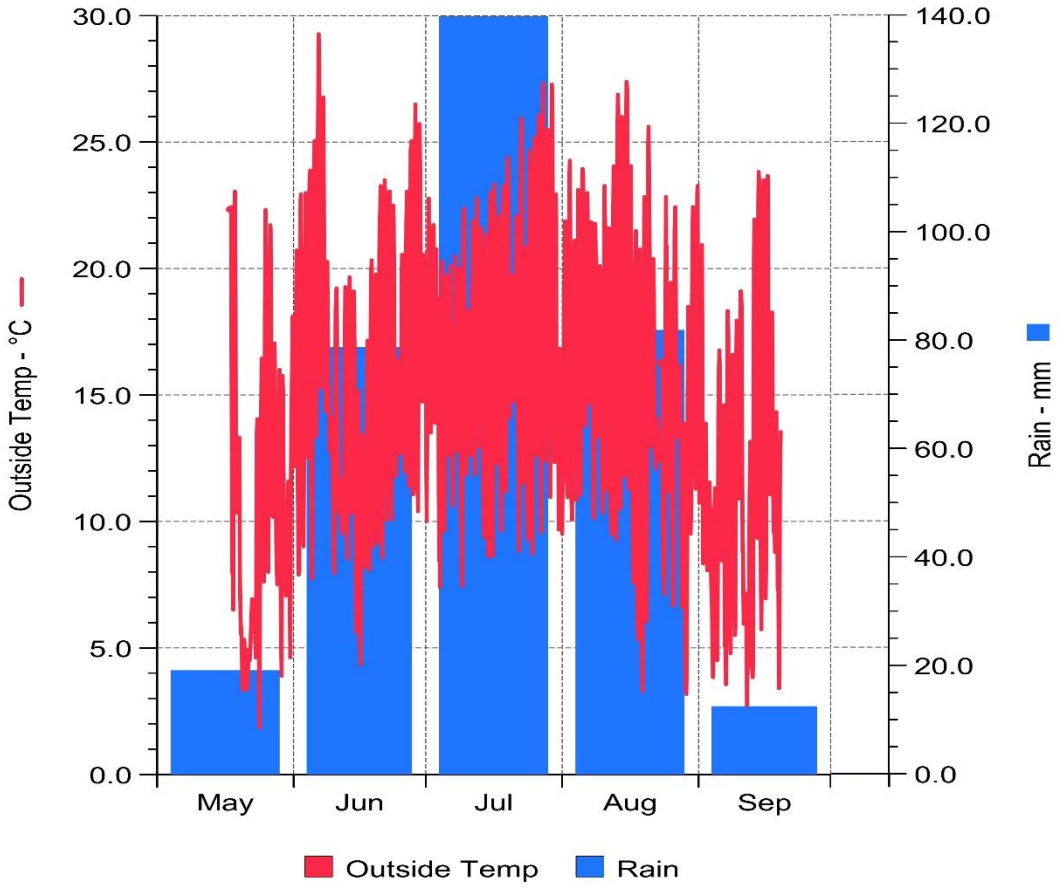
To provide yield and agronomic information of current cereal varieties as well as newer varieties to producers in west central Alberta.

Introduction

Variety selection plays an important role in production management due to the impact that yield, maturity and other agronomic characteristics can have on producer profitability. Variety testing continues to be important in providing producers with information on the performance of newly registered and established varieties. The yield and characteristics of cereals grown in our region are presented below.

	RVT - Project Description
Seeding Date	May 13
Seeding Specifics	Fabro zero till drill
Seeding Rates:	Seeding Depth: 1 inch 22 plants/ft^2 - 2-Row & 6-Row Barley; 30 plants/ft^2 - Flax 24 plants/ft^2 - HRS & Utility Wheat, Oats Seed treatment: Raxil
Fertilizer/ac	262 g/plot; 28.4 N-6.11 P -18.6 K- 0 S (Wheat, Oat, Barley & Flax) 114.5 lbs. N, 30 lbs. P, 15 lbs. K, 15 lbs. S
Herbicide	BuctrilM – 10-Jun Reglone – 4-Sep (Flax)

	Heat+Glyphosate – 07 May; Target – 26 May; Spectrum – 17 Jun; Reglone – 12 Aug (Wheat, Oat, 2-Row & 6-Row Barley)
Harvest Date	Sept 14 (Wheat); Sept 09 (2-Row & 6-Row Barley) Sept 22(Oat & Flax)



Westlock Weather Station Report

2-Row Barley – The majority of malt-grade barley produced is two-row. Two-row barley is characterized by having only one fertile spikelet at each node. Six-row barley has three fertile spikelets at each node. This lack of crowding in two-row barley allows for straight, symmetrical kernels with low dormancy; key characteristics essential for malting. The malting process begins by soaking the grain and causing it to germinate. The low dormancy and high seed viability in two-row barley is important for this process.

6-Row Barley- The world's most important crop for feeding livestock. As feed, it is nearly equal in nutritive value to corn, which is very high in energy. This leads it to be valuable in feedlots and as hog feed. Six-row barley allows for desirable portions of firm fat and lean meat.

Oats – Oats are a valuable part of crop rotation. They provide disease and insect breaks for wheat, barley, and canola. Their rapid establishment and growth provide excellent weed suppression. Oats also work well as a "catch crop" for taking up and storing excess nitrogen, and the straw provides a nutrient source for the following year's crop. The straw also protects against soil erosion, and contributes to an increase in the soils organic matter content.

Flax – grown mainly in cool northern climates. High omega-3 fatty acid and fiber in flax are some of the health benefits. Used in livestock feeding, human consumption and many other industrial uses.

In, 2016, GRO had 110 varieties of Barley, Wheat, Oat, Triticale, and Flax at their demo plot. We have yield for each plot but not reported here. I am pleased to announce that from year 2017, GRO will be back will the full regional cereal variety trial at westlock**. Please mark your calendar for third week of July, 2017 for our crop walk to see first-hand unbiased information on newer and local varieties of cereals.**

In 2016, GRO collaborated with three seed growers and seeded plots at our site. The results for the our contributor's varieties are reported in table below:

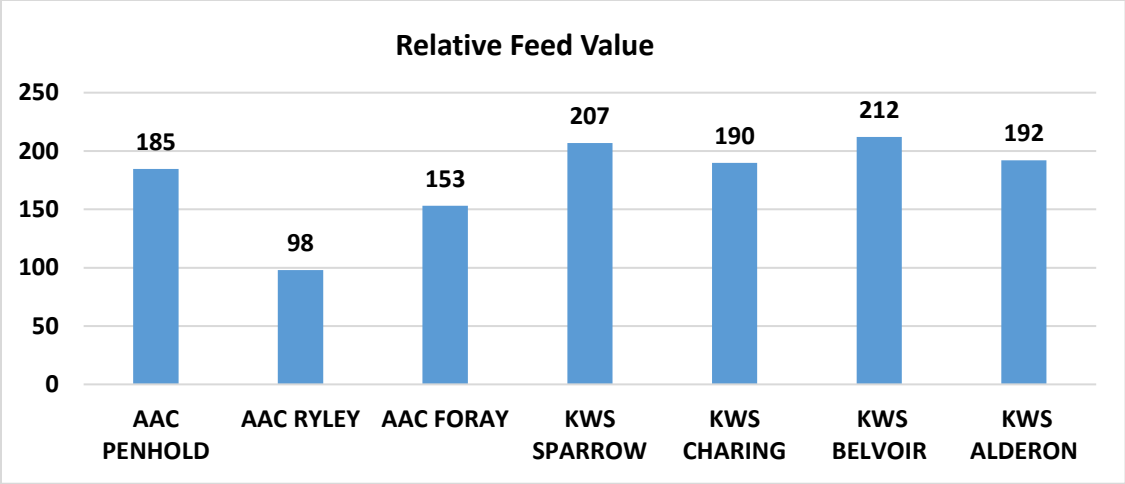
Contributor Name	Crop	Variety	14.5 % moisture yield (Bu/Ac)
Anderson Seed Grower	2-Row feed barley	Seebe	**94**
Anderson Seed Grower	2-Row feed barley	Busby	**99**
Anderson Seed Grower	6-row, smooth awned, hulled feed barley	Chigwewll	**96**
Rick's Pedegreed Seed	2-Row feed barley	CDC Austenson	**119**
Rick's Pedegreed Seed	2-row, malting barley	AC Metcalfe	**104**
Rick's Pedegreed Seed	2-row, malting barley	CDC Copeland	**100**
Rick's Pedegreed Seed	2-row, malting barley	CDC Meredith	**101**
Rick's Pedegreed Seed	CPS Wheat	AAC Penhold	**76**
Forward Seed Farms	CWRS Wheat	AC Muchmore	**74**
Forward Seed Farms	CPS Wheat	5700 PR	**83**
Forward Seed Farms	CPS Wheat	AAC Foray	**94**

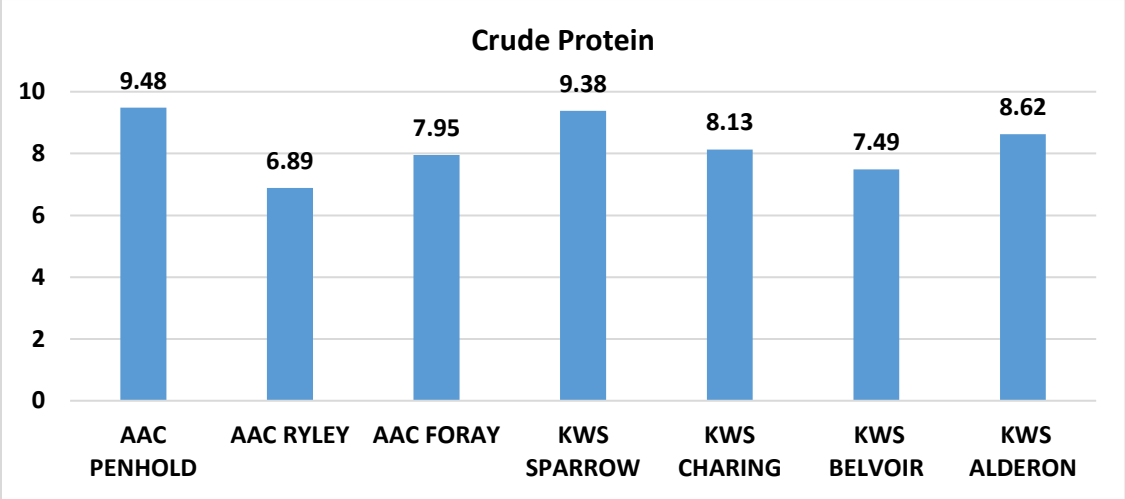
On demand from many producers from our region, we did a small trial for the wheat silage quality analysis. There was growing curiosity among grower regarding the silage value for the newer wheat varieties (Example: KWS series). So we collected samples from popular wheat varieties as well as KWS wheat and analyzed for the silage yield as well as nutritional quality of the feed samples. The results will help you understand if the KWS wheat can be used as silage.

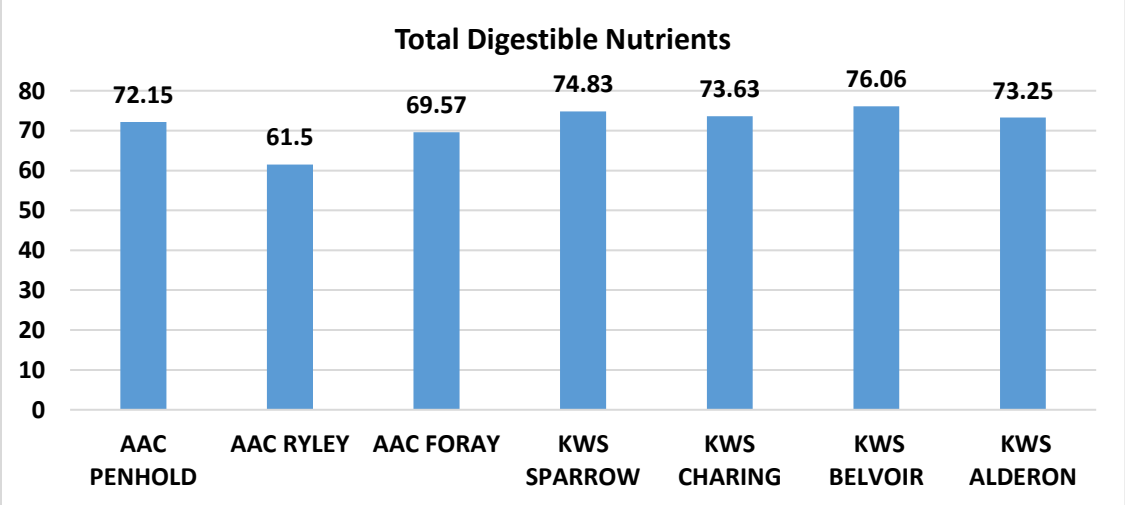
Wheat silage yields 2016

Varieties	total yield tonne/acre @ 65%
KWS Alderon	12.9
KWS Charing	12.5
KWS Sparrow	12.7
KWS Belvoir	11.8
AAC Foray	13.3
AAC Ryley	13.0
AAC Penhold	10.7

RPT_DSCRPT	AAC PENHOLD	AAC RYLEY	AAC FORAY	KWS SPARROW	KWS CHARING	KWS BELVOIR	KWS ALDERON
Dry Analysis							
Acid Detergent Fibre	21.5	35.17	24.81	18.06	19.6	16.48	20.09
Moisture	0	0	0	0	0	0	0
Calcium	0.14	0.21	0.16	0.12	0.09	0.09	0.11
Copper	3.68	3.23	4.02	3.78	4.04	3.57	4.17
Iron	62.6	63.3	55.4	52.65	56.05	45.99	81.9
Potassium	0.84	0.9	0.74	0.95	0.75	0.76	1.05
Magnesium	0.14	0.15	0.13	0.14	0.11	0.11	0.13
Manganese	28.34	12.92	19.46	29.28	30.22	29.47	31.22
Sodium	0.01	0.01	0.01	0.06	0.02	0.01	0.01
Phosphorus	0.23	0.13	0.18	0.24	0.28	0.24	0.24
Sulphur	0.12	0.1	0.12	0.13	0.11	0.1	0.12
Soluble Crude Protein	53.48	52.39	46.29	58.64	52.4	67.29	51.62
NFC	42.68	23.13	38.27	45.47	44.29	47.66	44.42
NDF-CP	1.23	1.49	1.31	1.96	1.18	1.84	1.02
ADF-CP	0.89	0.75	1.21	0.83	0.72	0.71	0.93
UIP (Bypass Protein)	23.26	23.8	26.86	20.68	23.8	16.36	24.19
Crude Protein	9.48	6.89	7.95	9.38	8.13	7.49	8.62
Dry Matter	100	100	100	100	100	100	100
Total Digestible Nutrients	72.15	61.5	69.57	**74.83**	73.63	76.06	73.25
NE Gain	1.08	0.78	1.01	1.16	1.13	1.2	1.12
NE Lactation	1.65	1.39	1.59	1.72	1.69	1.75	1.68
NE Maintenance	1.81	1.5	1.73	1.88	1.85	1.92	1.84
Relative Feed Value	185	98	153	207	190	212	192
Neutral Detergent Fibre	36.34	58.48	42.28	33.65	36.08	33.35	35.46
Zinc	19.86	12.5	14.56	17.37	17.38	14.92	18.54


Relative Feed Value
250
200
150
100
50
0
185
98
153
207
190
212
192
AAC PENHOLD
AAC RYLEY
AAC FORAY
KWS SPARROW
KWS CHARING
KWS BELVOIR
KWS ALDERON


Crude Protein
10
8
6
4
2
0
9.48
6.89
7.95
9.38
8.13
7.49
8.62
AAC PENHOLD
AAC RYLEY
AAC FORAY
KWS SPARROW
KWS CHARING
KWS BELVOIR
KWS ALDERON


Total Digestible Nutrients
80
70
60
50
40
30
20
10
0
72.15
61.5
69.57
74.83
73.63
76.06
73.25
AAC PENHOLD
AAC RYLEY
AAC FORAY
KWS SPARROW
KWS CHARING
KWS BELVOIR
KWS ALDERON

Regional Field Pea Variety Trials

Cooperator: Ken Anderson **Location** - NW 32 – 59 – 2 - W5

To provide yield and agronomic information of current yellow and green pea varieties as well as newer varieties to producers in west central Alberta.

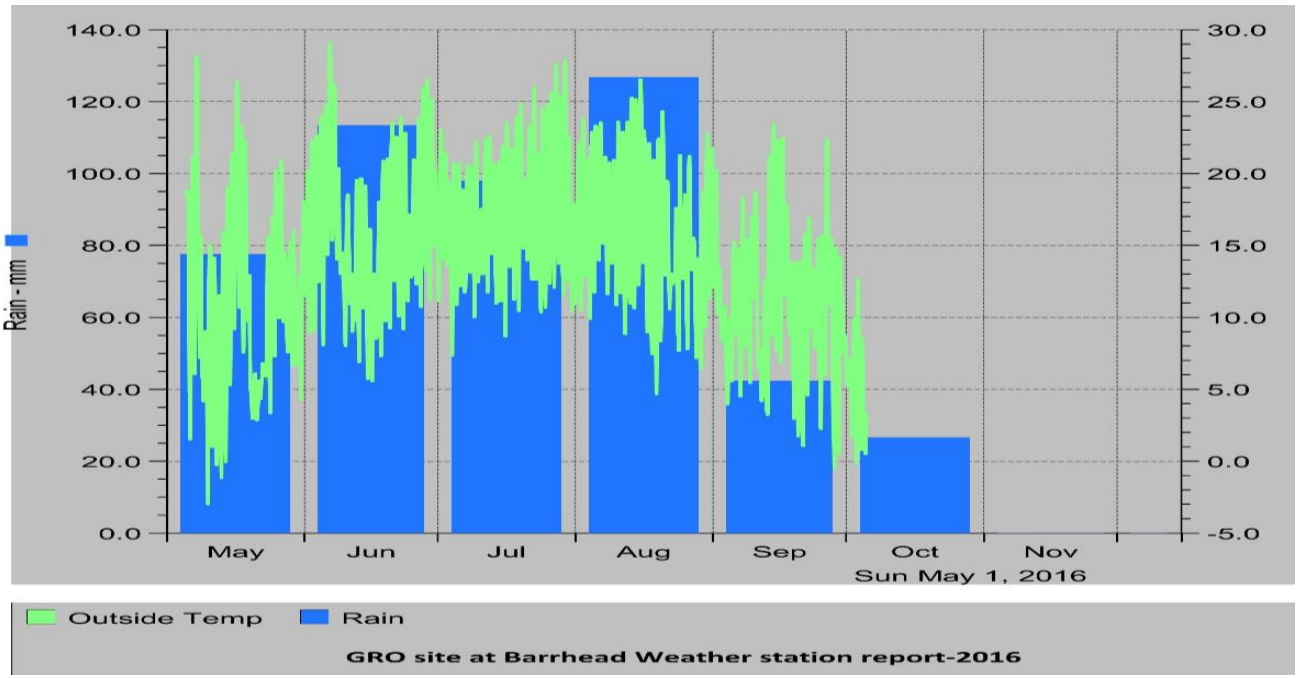
Introduction

In 2009 the Special Crops Regional Variety Testing Program was reinstated by Alberta Agriculture and Rural Development. Seed companies and the Alberta Pulse Growers also supplied funding for the program. Each year a summary report is compiled of all the sites within Alberta and the British Columbia Peace region. The yield and characteristics of cereals grown in our region are presented below.

	RVT - Project Description
Seeding Date	May 10
Seeding Specifics **Seeding Rates:**	Fabro zero till drill Seeding Depth: 1.5 inch 7 plants/ft^2 – Yellow and Green pea Innoculant: Sell-tech granular
	RVT - Project Description
Fertilizer/ac	55 lbs of Actual K side band; 21 lbs Actual P seed placed.
Herbicide	MCPA Amine 600 0.3L/Acre– 13 May; Basagran 0.8 L/ac - 08 june
Harvest Date	Aug 31

Result: There was no incidence of lodging in any of plots. Among the Green pea varieties, **CDC greenwater** yielded significantly higher than other varieties. Among

yellow pea varieties, **CDC Inca** and **AAC carver** were best yielding in our region in 2016.



		Height (cm)	Yield (Bu/Acre)	1000 Kernel wt.
Green Pea				
1	**CDC LIMERICK**	109 -	71.5 ab	226 ab
2	**AAC RADIUS**	99.8 -	68.7 ab	214 b
3	**AAC ROYCE**	116.0 -	61.4 b	252 a
4	**CDC GREENWATER**	110.3 -	79.8 a	204 b
CV		9.7	8.5	7.3
Yellow Pea				
1	**CDC AMARILLO**	118.8 -	67.9 c	206 bc
2	**CDC MEADOW**	109.5 -	71.6 bc	199 d
3	**AAC BARRHEAD**	126.0 -	76.9 ab	215 b
4	**AAC CARVER**	123.3 -	80.1 a	217 b
5	**CDC INCA**	129.3 -	82.5 a	222 ab
6	**LN4228**	111.8 -	71.0 bc	240 a
CV		10.7	5.5	8.8

*Varieties that share a letter did not differ significantly from one another ($p>0.05$).

Alberta Wheat Commission Fertility Trial

Optimizing nitrogen application rate for Wheat-Canola/Pea-Wheat rotation using urea and polymer coated urea (ESN).

Background:

Nitrogen recommendations for major crops using different rates of Urea and ESN alone as compared to a mix of Urea with ESN are not yet developed for different regions of Alberta. The results from current research will provide optimum knowledge for application of nitrogen fertilizer rates and will provide an economic benefit to growers. Based on literature references, it was speculated that Spring Wheat yield, quality, and economics differ significantly by applying different N application rates from urea, and ESN. The integrated use of slow release nitrogen fertilizers (ex. ESN) along with readily available nitrogen fertilizers (ex. urea) would be able to meet the quick initial (urea) and later (ESN) nutrient demand during the growing season to meet the nutrient uptake pattern of crops. This would also reduce environmental nitrogen loss and may increase return on fertilizer investment (Haben et al 2014). Variation of agronomic management practices such as fertilizer application rates has a significant influence on grain yield and grain quality in term of wheat protein percentage (Campbell et al., 1977). The efficiency of using urea, ESN or their mix will facilitate the need for N fertilizer only when a crop response is expected and thereby can increase the profitability (Mullen et al., 2003). Grain protein concentration is an important quality measure which is essential for the nutritional value and end-use rheological characteristics of the bread making process (Johansson et al., 2001). The amount of nitrogen affects the wheat protein and can account for a variability of up to 35% for the total protein content at a lower temperature condition (Malik et al., 2013).

Collaborative Partners: This trial was conducted in collaboration with Battle River Research Group (BRRG) and Gateway Research Organization (GRO).

Methodology and Experimental Approach:

Two-year site history on the crops grown, herbicide and fertilizer rate was collected for site with soil test. RCBD (Randomized Complete Block Design) arranged as split plot, with 6 to 8 replications during the first year (wheat). Three Nitrogen fertilizer regimes (Urea, ESN and Urea plus ESN) and, five rates of N (20, 40, 60, 80, and 100 pounds N/acre (side band) + C2 (with Seed) were combined factorially and their influence on grain yield and grain quality components was be determined. Treatments: Fertilizer packets for individual plots was weighed for accurate application rate through the second cone on seeder.

Three controls were used:

a) No-Fertilizer (check)

b) MAP (Mono-ammonium phosphate) @ 25 lbs P2O5/acre with seed (C2)

c) 80 pounds N/acre (After soil test + needed Fertilizer = 80 lbs N/acre)

Three Nitrogen fertilizer regimes (Urea, ESN, and Urea plus ESN) and, five rates of N (20, 40, 60, 80, and 100 pounds N/acre (side band) so a total of 15 treatments were randomized with 6 replications. Here is treatment plan chart:

No fertilizer Control	C1	Phosphorus only Control	C2	80 pounds N/acre (soil test + Fertilizer = 80 lbs N/acre)	C3
Trt Urea 20lb N/acre	U1	Trt ESN 20lb N/Acre	E1	Trt Urea+ESN 20lb N urea	M1
Trt Urea 40lb N/acre	U2	Trt ESN 40lb N/Acre	E2	Trt Urea+ESN 40lb N urea	M2
Trt Urea 60lb N/acre	U3	Trt ESN 60lb N/Acre	E3	Trt Urea+ESN 60lb N urea	M3
Trt Urea 80lb N/acre	U4	Trt ESN 80lb N/Acre	E4	Trt Urea+ESN 80lb N urea	M4
Trt Urea 100lb N/acre	U5	Trt ESN 100lb N/Acre	E5	Trt Urea+ESN 100lb N urea	M5

Hard Red Spring Wheat (Variety – Plentiful at BRRG and GRO) seeded after Canola. Variety Plentiful is selected because it has very good resistance to lodging, and moderately resistant to stripe rust and fusarium head blight (Alberta Seed Guide - spring 2015). Management steps were as mentioned in previous chapter with Regional Variety Trial. Plot length of individual plots measured

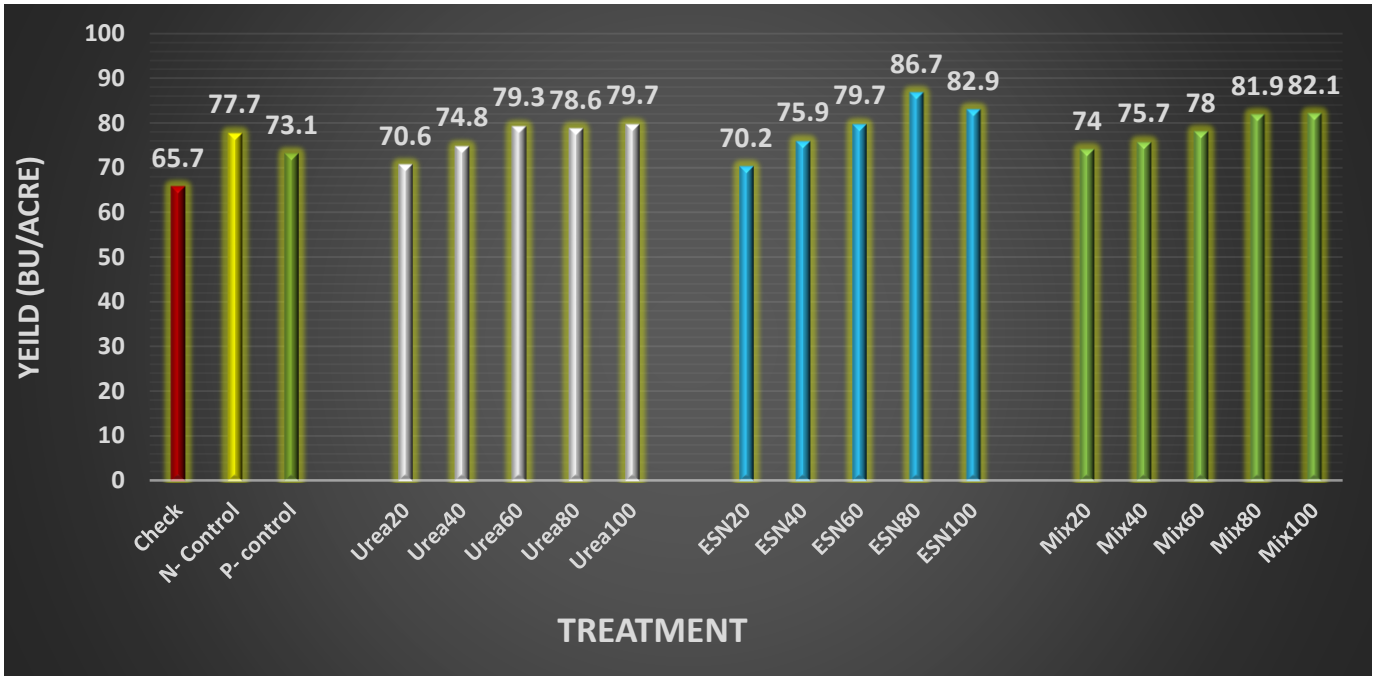
before harvest, plant height, yield and thousand kernel weight. For grain quality: a composite sample about 500-gram cleaned for protein analysis at the local elevator

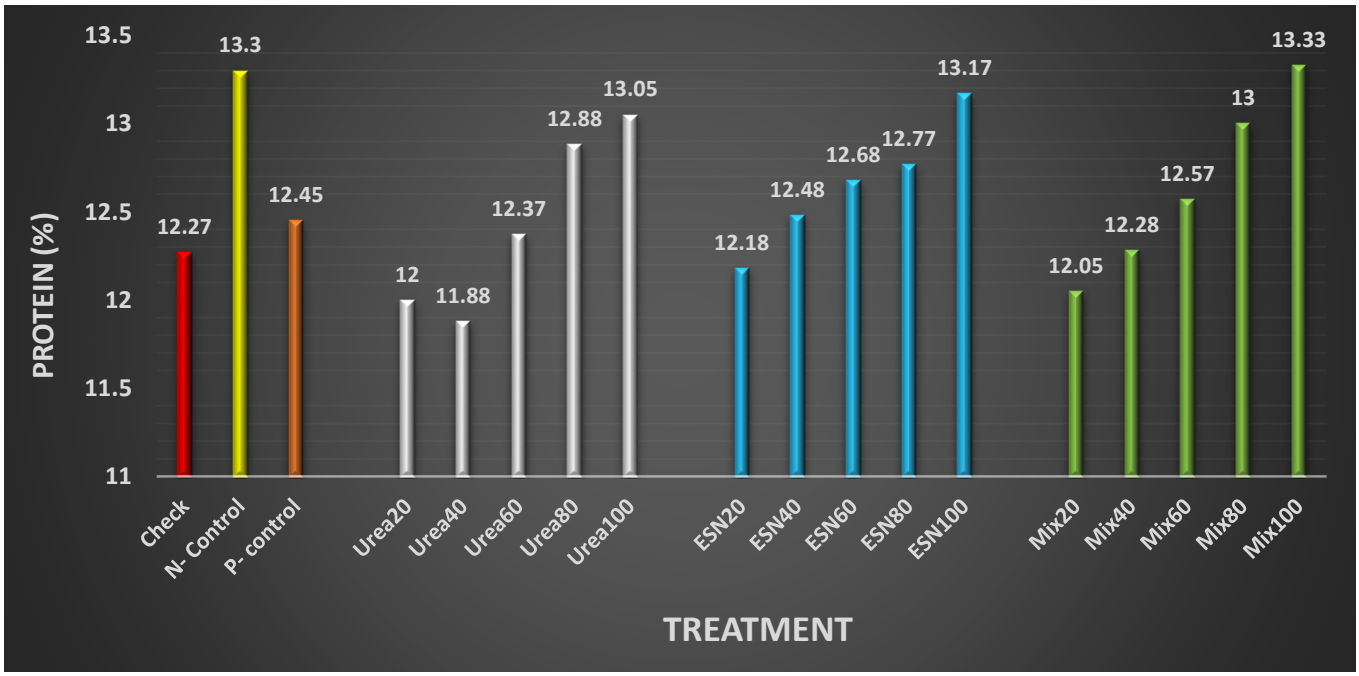
Result and Discussion:

The trend of increasing the rate of fertilizer lead to increase in yield was clearly noticeable in urea as well as ESN. In present trail yield were maximum with 80 lbs of ESN treatment. However, no statistical increase in yield compared to control was observed after 60 lbs of UREA or ESN alone or 60 lbs of UREA-ESN mix at 60 lbs. The protein % was higher in grain with treatment higher rate of fertilizer and was significantly higher in wheat from 80 lbs of Urea-ESN mix compared to control.

Treatment	Plant ht (cm)	Yeild (Bu/Acre)	Protein %	1000 Kernal weight	Bushel Weight (Lbs/Bushel)
Check	82.7 b	**66** d	12.3 c-g	37.78 ab	62.8 -
N- Control	86.7 ab	**78** abc	13.3 a	37.7 ab	63.2 -
P- control	85.3 ab	**73** bcd	12.5 b-g	37.8 ab	63.0 -
Urea20	83.2 b	**71** bcd	12.0 fg	37.0 ab	63.0 -
Urea40	85.5 ab	**75** a-d	11.9 g	36.3 b	62.8 -
Urea60	87.8 ab	**79** abc	12.4 b-g	37.5 ab	62.2 -
Urea80	87.5 ab	**79** abc	12.9 a-e	37.4 ab	62.3 -
Urea100	87.8 ab	**80** abc	13.1 abc	37.6 ab	62.4 -
ESN20	87.2 ab	**70** cd	12.2 d-g	38.8 a	64.3 -
ESN40	88.0 ab	**76** a-d	12.5 b-g	37.8 ab	62.7 -
ESN60	90.5 ab	**80** abc	12.7 a-g	38.4 a	62.6 -
ESN80	87.8 ab	**87** a	12.8 a-f	38.4 a	62.7 -
ESN100	89.7 ab	**83** ab	13.2 ab	38.4 a	62.9 -
Mix20	87.7 ab	**74** bcd	12.1 efg	38.5 a	62.6 -
Mix40	86.5 ab	**76** a-d	12.3 c-g	38.6 a	62.9 -
Mix60	90.0 ab	**78** abc	12.6 a-g	38.1 ab	62.5 -
Mix80	90.8 ab	**82** abc	13.0 a-d	38.5 a	62.7 -
Mix100	93.0 a	**82** abc	13.3 a	38..1 ab	62.7 -

*Varieties that share a letter did not differ significantly from one another ($p>0.05$).





ACKNOWLEDGEMENTS: We would like to thank **Alberta wheat Commission (AWC)** for their financial assistance for this trial.

Prairie Oat Growers Association Variety Trial

Increase the Oat Acres in Alberta by Finding a High Yielding Oat Variety that maximizes Producer Income and Meets the Demands of the Millers.

Summary:

This study is a continuous effort to collect data on 11 milling variety oats and 4 feed oat varieties in Central and Northern Alberta. The goal was to determine how variety and growing location will influence the yield and functional property attributes linked to beta-glucan levels of the oats. There was noticeable difference of the location on the varietal yields as well as beta-glucan content. However it will be too early to recommend best suited variety for the both trail locations. The data collected in year one along with planned trail for at least another two year and we aim to provide more concrete evidence for selecting most appropriate variety suited to producers in our regions.

Background

Oat production in Alberta has been on a relatively steady decline since 2011. Oats has earned the status of major Canadian export crop from a domestic crop status. According to Prairie Oat Grower's Association (POGA), an estimate of 3.1 million acres of oat were seeded in year 2015-16 but there is a decline in Alberta due to lack of markets and non-competitive pricing with other crops. Many major millers will not accept oats from Alberta, or look to Alberta only after Manitoba and Saskatchewan's supply is gone, because the main two oat varieties grown in Alberta, Morgan and Derby contain low amounts of Beta Glucan (β-glucan). A minimum of 4% β-glucan is required for companies to be able to label their products with the Heart Healthy Claim and both Morgan and Derby are consistently below that amount. Therefore, oat producers in Alberta need an oat variety that can consistently beat the yields of Morgan and Derby but has the higher β-glucan

amounts that the oat miller desire. To emphasize this fact, in 2015 two millers are helping to fund this variety trial to get it started before outside funding can be located to make oats in Alberta more competitive.

Oats are a valuable part of crop rotation and are therefore beneficial to producers. They provide disease and insect breaks for wheat, barley, and canola. Their rapid establishment and growth provide excellent weed suppression. Oats also work well as a “catch crop” for taking up and storing excess nitrogen, and the straw provides a nutrient source for the following year’s crop. The straw also protects against soil erosion, and contributes to an increase in the soils organic matter content (Campbell et al., 1991). A well-planned management and appropriate selection of variety makes oats a profitable crop due to their low input requirements and favorable effects on succeeding crops in a rotation.

Test weight is the most commonly used indicator of grain quality. High test-weight varieties should be chosen by growers who intend to market oat grain. However, the functional attribute such as β-glucan solubility and viscosity are main criteria for the processing industry. Many studies have shown that oat β-glucan can lower blood cholesterol levels, glucose and insulin response and therefore decrease the risk of cardiovascular diseases and prevention of diabetes (Wang and Ellis, 2014).

Oats are regularly affected by crown rust in other parts of Western Canada but this issue is moving west, towards Alberta. Neither Morgan or Derby varieties have crown rust resistance but selecting a new disease resistance varieties can overcome the problem. The information for producer to choose the newer and higher yielding varieties specific to their region is therefore very important step to stay profitable in the oat production. The β-glucan content in oat may varies with change in growing conditions (Perez Herrera et al., 2016). The current trial will provide the valuable agronomic information for the producers in Alberta to grow oat varieties with higher yield and increased functional properties (β-glucan) attribute.

Objective: To investigate the impact of genotype and growing condition on the yield and β-glucan content of milling oat varieties in Alberta.

Methodology

Eleven milling oat varieties and four forage oat varieties were tested in 2016 (Table 1). Based on the soil fertility recommendations, fertilizers were added to maintain the optimal levels growing condition. Seeding rates were calculated based on 1000 kernel weight of each variety with a Seed Counter, desired plant density and germination percentage. A 9-inch spaced 6 row Fabro small plot seeder was used for the seeding. Each plot of a variety occupied 10.96 sq. m. (1.37 m width and 8 m long) and there were three replications. The trial site was maintained weed-free with use of herbicides or hand weeding method (Table 1).

Table 1: Agronomic details for the POGA Trail 2016

Location:	**Peace region (Dion East)**	**Westlock**
Seeding Date:	May 17th, 2016	May 13th, 2016
Seeding Date:	Sept 16th, 2016	Sept 27th, 2016
Soil Temp:	not indicated	10.4 Celsius
Soil Moisture:	adequate	very poor
Seeding Depth:	1.5 inch	1.5 inch
Tank A (Seed placed)	phos (51.4g/plot)	phos (86 g/plot)
Tank B (Side Banded)	general blend (525.4g/plot)	general blend (285g/plot)
Fert. Nutrients	**130N-30P2O5-25K2O-25S**	**20.4N- 42P2O5- 48K20- 00S**
Cone 1	seed package	seed package
Herbicides applied to trial	Pre-burn Transorb 0.5L/Acre on May 2; 2016 and Express pro 7 gm/Acre on May 2; 2016	Pre-burn Roundup 1L/Acre on May 6; 2016
Herbicides applied to trial	In crop Broad leaf: stellar A (400 ml/ Acre) + stellar B (240 ml/ Acre) on 05 June, 2016	In crop Broad leaf: Buctril M (400 ml/ Acre) on 13 June and Curtail M (600 ml/ Acre) on 22 June
Fungicides applied to trial	Proline (140 ml/Acre) on July 4, 2016	Headline (160 ml/Acre) on July 8, 2016
Rainfall (mm)	485	404
Comment:	Fertilizer applied with a cereal blend that was used in their all cereal trails.	Target yield was 120 bu/acre of Oat and fertilizer applied on based of soil test. High residual N in soil test.

The trial was harvested with a Wintersteiger Nursery Mate Elite combine (5 foot header) and grain yield from each plot were measured using Electronic Scales at the site. The moisture content was immediately measured using Grain moisture tester. The geographical and climate information throughout the trial were recorded using Davis Instrument weather stations at the trial site. After harvesting, a clean composite sample (500 g) was collected and sent to laboratory analysis for the β-glucan estimation.

Oat grain dehulling and stabilization

The oat seeds were dehulled with an impact huller (Warner Control Techniques), aspirated to remove most of hulls, and further hand-picked to obtain hull-free groat samples. Heat treatment was applied to dehulled oat groats to inactivate the native enzymes. Oat groats (100 g) were steamed in a kitchen vegetable steamer with a lid by placing the groats on the metal shelf (layered with a cheese cloth) over boiling water for 20 min. After steaming, the samples were dried in a forced air oven at 78 °C for 1h, 63 °C for 30 min and 50 °C for overnight. The oat groats were then ground using the Retsch ZM 200 sample mill (Retsch GmbH, Rheinische Straβe 36, 42781 Haan, Germany) equipped with a 0.5 mm screen into flours.

Analytical methods

Quantitative estimation of moisture was performed by standard AACC (2000) procedures. Beta-glucan content was determined using the mixed-linkage beta-glucan assay kit (Megazyme International Ireland Ltd., Wicklow, Ireland). Thousand-grain and thousand-groat weights were determined by manually counting and weighing 200 grains and 200 groats (before heat treatment), respectively, and multiplying each number by 5. All the determination was done in duplicate and beta-glucan content was reported on dry matter basis.

Results and Discussion

Using data from an onsite Davis Instruments Vantage Pro2 weather station at our research site, weather data was summarized for the 2016 growing season (Table

2). Variety trial results for 2016 Westlock and peace region sites are presented in Table 3 and Table 4 respectively. Yields reported are on a 34 lb/bushel basis with moisture adjustments at 13.5%. At Westlock site, there was no statistical difference between the yields obtained for 11 milling varieties. However, Sea biscuit was numerically highest yielding variety for 2016. At Peace region, Ruffian was significantly higher milling oat type than most of the other varieties except Morgan and Sea biscuit.

Test weight is the most important indicator of grain milling quality. At Westlock site, the test weight result for Akina was higher than Kara and Orrin with other milling oat at intermediate levels. However, no statistical difference was observed for the same varieties at Peace region.

The beta-glucan content of the 11 different milling varieties ranged between 3.8% and 5.0%, with the lowest reported for Ruffian (3.8%) at both sites and Akina and Kara (5.0%) were among highest beta glucan levels for both the sites (Table 5) and Figure 1.

Conclusion:

The yield results from a single year are not reliable predictors of next years' yield. We observed a visible difference of location on yields that changes with variety too. As this was year one data from ongoing trial. Based on year one data, Sea biscuit performed very well at both locations with staying in top 3 varieties for yield and average above 4.5% of beta-glucan content. That being said, as environment and disease conditions can fluctuate greatly from year to year, so it is important to consider yields averaged over multiple years. We hope with more data available, we would able to speculate for best suited for the specific region.

Table.3: POGA OAT trial 2016 (Westlock Site Yield Data)

No.	Variety	Yield (bu/ac)		1000 Kernel Weight		Bushel Wt. lb/bushal		Test weight kg/HL	
1	Morgan	153.81	ab	48.83	ab	42.40	ab	52.32	ab
2	Camden	144.60	b	46.84	a-d	42.10	ab	51.95	ab
3	Seabiscuit	**174.86**	**ab**	49.12	a	41.18	abc	50.82	abc
4	Triactor	155.93	ab	43.00	def	42.01	ab	51.85	ab
5	Ruffian	168.73	ab	46.38	a-e	40.46	abc	49.93	abc
6	Orrin	168.60	ab	48.38	ab	40.05	bc	49.42	bc
7	Summit	160.19	ab	40.73	f	40.62	abc	50.12	abc
8	Souris	142.33	b	40.88	f	40.45	abc	49.92	abc
9	Akina	162.21	ab	45.12	b-e	38.82	cd	47.91	cd
10	Kara	160.32	ab	44.23	c-f	42.72	a	**52.72**	a
11	Minstrel	156.41	ab	45.19	b-e	39.16	cd	48.33	cd
12	CDC SO-1	164.33	ab	47.40	abc	37.31	d	46.04	d
13	CDC Nasser	177.07	ab	42.70	ef	37.87	d	46.73	d
14	Mustang	**181.43**	**a**	44.89	b-e	41.16	abc	50.79	abc
15	Baler	168.27	ab	43.98	c-f	41.06	abc	50.68	abc
Standard Deviation		11.874		1.133		0.914		1.127	
CV		7.3		2.51		2.26		2.26	
Treatment Prob(F)		0.0143		0.0001		0.0001		0.0001	

Table.4: POGA OAT trial 2016 (Peace Region Site: Yield Data)

No.	Variety	Yield (bu/ac)		1000 Kernel Weight		Bushel Wt. lb/bushal		Test weight kg/HL	
1	Morgan	202.5	ab	43.8	abc	41.1	-	50.7	-
2	Camden	190.3	bc	45.0	ab	41.2	-	50.8	-
3	Seabiscuit	202.8	ab	45.0	ab	39.6	-	48.8	-
4	Triactor	188.5	bc	42.2	a-d	39.9	-	49.2	-
5	Ruffian	**217.5**	**a**	43.6	abc	42.0	-	51.8	-
6	Orrin	168.0	c	46.6	a	41.6	-	51.3	-
7	Summit	173.1	c	41.4	bcd	42.3	-	52.2	-
8	Souris	168.6	c	34.4	e	41.5	-	51.2	-
9	Akina	190.4	bc	42.2	a-d	40.1	-	49.4	-
10	Kara	190.2	bc	39.6	cd	41.3	-	51.0	-
11	Minstrel	192.3	bc	42.4	a-d	47.7	-	58.8	-
12	CDC SO-1	192.3	bc	38.5	d	38.3	-	47.2	-
13	CDC Nasser	173.7	c	38.7	d	43.0	-	53.0	-
14	Mustang	194.1	bc	45.1	ab	40.9	-	50.5	-
15	Baler	183.2	bc	46.1	ab	38.3	-	47.3	-
Standard Deviation		9.83		1.75		3.35		4.14	
CV		5.22		4.13		8.12		8.14	
Treatment Prob(F)		0.0001		0.0001		0.2487		0.253	

*Varieties that share a letter did not differ significantly from one another (p>0.05).

Table 5: The beta-glucan analysis results from the POGA trial 2016.

Location	Variety	Hull %		Flour Moisture (%) (after heat stabilization)		Flour beta-glucan (%, db)	
Westlock	Morgan	23.11	-	4.00	e	3.78	de
Westlock	Camden	24.85	-	3.73	f	4.44	bc
Westlock	Seabiscuit	23.39	-	3.48	g	4.56	b
Westlock	Triactor	30.29	-	5.29	a	4.42	bc
Westlock	Ruffian	22.34	-	4.01	e	3.83	de
Westlock	Orrin	24.92	-	3.08	i	4.37	bc
Westlock	Summit	22.79	-	2.79	j	4.28	bcd
Westlock	**Souris**	**26.01**	**-**	**3.29**	**h**	**4.93**	**a**
Westlock	**Akina**	**21.43**	**-**	**4.23**	**d**	**5.03**	**a**
Westlock	Kara	30.12	-	4.30	d	4.33	bc
Westlock	Minstrel	22.18	-	4.65	bc	3.86	de
Westlock	CDC SO-1	30.62	-	3.72	f	4.01	cde
Westlock	CDC Nasser	26.91	-	4.78	b	3.78	de
Westlock	Mustang	31.19	-	3.12	i	3.62	e
Westlock	Baler	25.19	-	4.53	c	3.80	de

Location	Variety	Hull %		Flour Moisture (%) (after heat stabilization)		Flour beta-glucan (%, db)	
Peace	Morgan	26.45	-	4.60	b	4.20	cd
Peace	Camden	30.58	-	4.25	c	4.62	abc
Peace	Seabiscuit	28.12	-	3.54	ef	4.58	abc
Peace	Triactor	27.41	-	3.48	ef	4.46	bcd
Peace	Ruffian	27.98	-	3.42	f	3.93	d
Peace	Orrin	28.00	-	4.42	bc	3.99	d
Peace	Summit	29.09	-	4.24	c	4.43	bcd
Peace	Souris	28.30	-	3.69	de	4.42	bcd
Peace	Akina	26.94	-	4.54	b	4.92	ab
Peace	**Kara**	**23.53**	**-**	**5.36**	**a**	**5.01**	**a**
Peace	Minstrel	23.75	-	3.79	d	4.27	cd

*Varieties that share a letter did not differ significantly from one another ($p>0.05$).

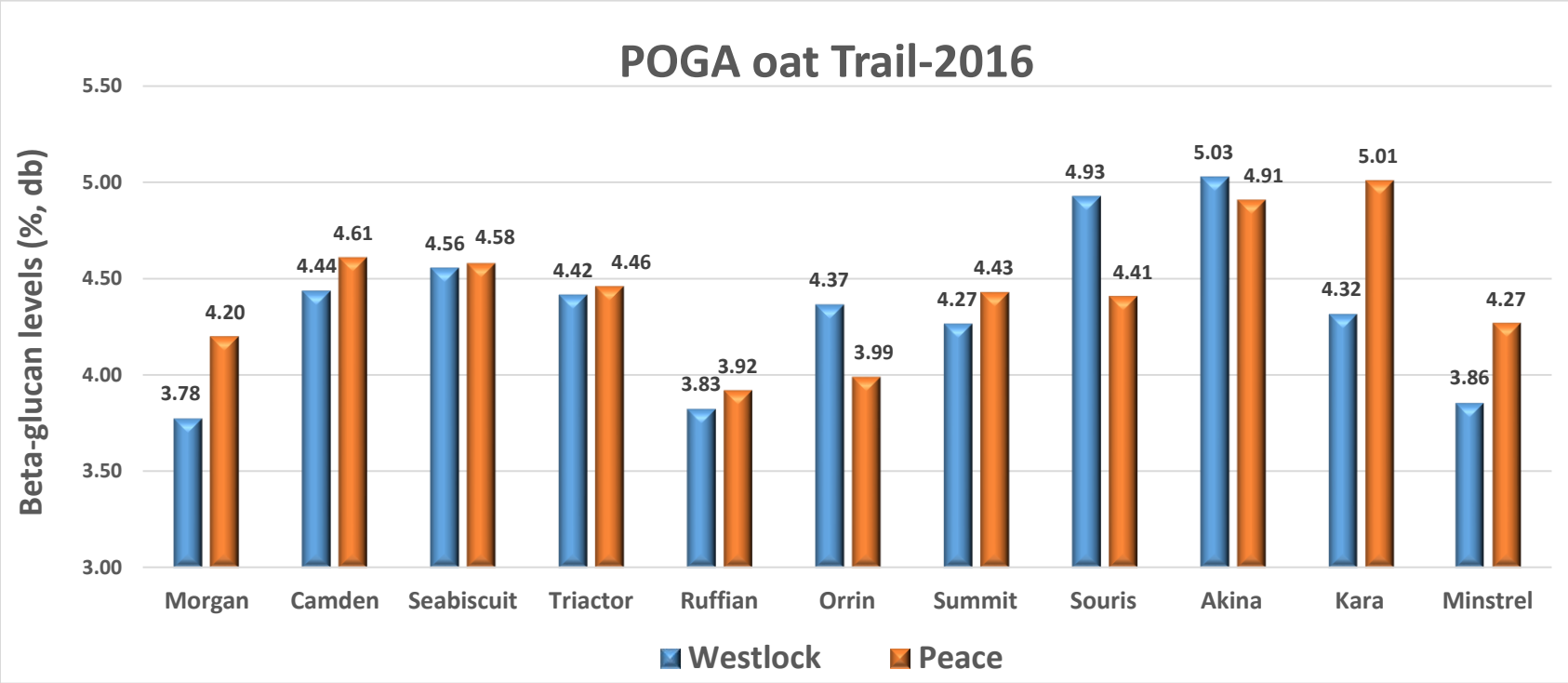


Figure: 1: The beta-glucan level of 11 milling oat varieties evaluated in 2016.

ACKNOWLEDGEMENTS: We would like to thank **Prairie Oat Growers Association (POGA)** for their full financial assistance and FP Genetics for their contribution in lab analysis for this trial. We would also like to thank Adilord Petryshen, Jubilee Farms, Don Gibson, Canada Seed depot, FP Genetics, and La Coop Federee for their generous donation with this trial. This information is presented with the understanding that no product discrimination is intended and neither endorsement of any variety/product mentioned, nor criticism of unnamed variety/products is implied.

2016 Ultimate Canola Challenge

2016 UCC Objectives:

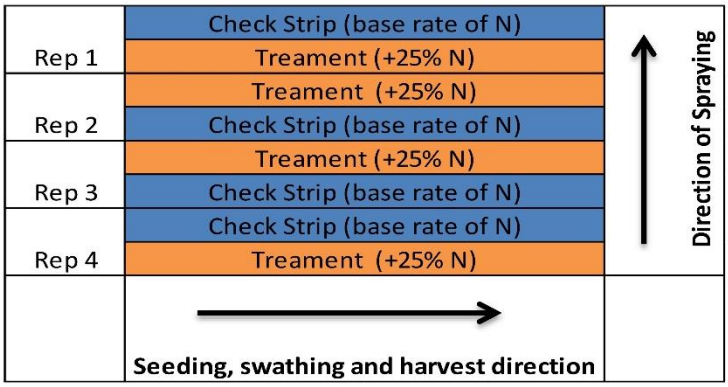
- Educating farmers on the most effective way to carry out on-farm trials, while collecting data from these trials to share with the canola industry.
- Identifying agronomic and economical optimal Nitrogen rates for canola in Western Canada.

Grower Considerations:

- This is a good project for grower interested in learning how increasing Nitrogen rates affect yield and economics of their canola crop.
- Growers must be able to increase just Nitrogen rates (without increasing Phosphorus or Sulphur rates)
- Note collection will be important in assessing results from the trial.
    - Rainfall information (dates and amounts)
    - Plant Stand Counts at 20-25 days after seeding and assess the number of plants per square metre (or square foot).
    - Refer to 2016 UCC Note Collection (Nitrogen) for note collection procedures.

Trial Layout

- Check strip will be your base rate of Nitrogen – what you normally apply to your crop based off soil test results.
- Treatment will be increasing actual Nitrogen by 25% (Additional treatments can be added, however for coordinated trials across Western Canada, 25% must be included).
    - It is important to increase only Nitrogen rates, not other nutrient rates. This would lead to confounding affects, where an increase in yield could not be attributed to Nitrogen specifically.
- Replicate the check strip and treatment at least 4 times throughout the field.
- Randomize strips throughout the field.
- The area of the field for the trial should be as uniform as possible, avoiding headlands, field edges and water ways.
- Any disease, weed or insect control must be applied perpendicular to the direction of seeding.
- The width of a strip must be at least as wide as the combine pass, preferably wider.
    - Leave a 2’ gap on either side of the plot to ensure treatments aren’t mixed.

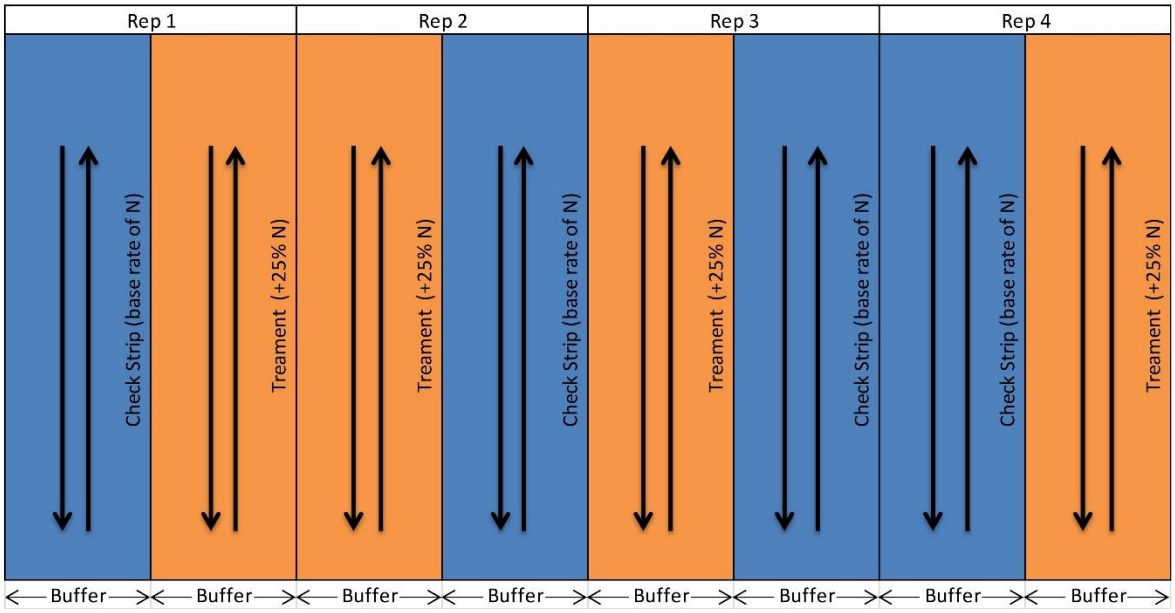


Field-Scale Trial Tips

- **Leaving a check strip:**
    - Leave a check strip in the trial. A check strip ensures differences in crop performance in the treatments are due to the treatment differences and not naturally occurring spatial variation. The further the check strip is from the other treatments, the less confident one can be that differences in product performance are real.
    - The check strip should reflect your best management practices for your canola crop. Check strips should not be on field edges or areas that are not typical of the field.
    - The selected field should be as uniform as possible in topography and soil. If a uniform area is not possible, choose an area of the field that reflects the field as a whole.
- **Seeding:**
    - Ensure the same variety is used for all treatments in the trial.
    - Seeding rate, seeding depth and speed must be the same for the entire trial.
    - Seed entire trial on the same day.
- **Fertility:**
    - Profitable canola production relies heavily on adequate plant nutrition. The field should be soil sampled in detail – 0-6", and 6 – 24"depths testing for N, P, K S and all micronutrients. Also test for EC, pH and Organic matter.
    - If required, tissue testing can be done to measure the nutrient content of above - ground plant parts during growth.
        - If tissue testing, avoid unusual, dead or stressed plants, as well as those covered with soil or recent sprays.

- Cut samples with a clean, rust-free knife or scissors. Send separate samples from good and poor areas within a field.
- Make sure the plants in each area are at the same growth stage.
- Get full testing requirements from the lab you will be submitting samples to.

- **Weed Control:**
  - Use normal weed control practices for the entire trial. Follow label recommendations for rates and timing.
  - When spraying a herbicide, spray perpendicular to the direction of seeding to ensure the same amount of wheel tracks throughout the trial. Apply to all treatments on the same day.
- **Disease Control:**
  - Use normal disease control measures for the entire trial if required.
  - If applying a fungicide, spray perpendicular to the direction of seeding to ensure the same amount of wheel tracks throughout the trial. Apply to all treatments on the same day.
- **Insect Control:**
  - Use normal insect control measures for the entire trial, if insects exceed acceptable thresholds. Follow label recommendations for rates, thresholds and timing.
  - If chemical control of insect pests is necessary, select a product registered for the purpose, and apply it at a stage when a benefit is ensured. Applying too early or too late in the life cycle of the pest you are targeting may not give a desired result. Apply to all treatments on the same day.
- **Swathing/Straight Cutting:**
  - If swathing the canola crop, swath at 60% seed colour change.
  - Swath/straight-cut all treatments on the same day.
  - Swath/straight-cut up the middle of the plot, leaving a buffer on each side.
    - When swathing, mark the swath that represents your plot with a flag.
    - Swath the remainder of the field after the plots have been swathed.
  - Minimum swathing/harvest length is 500 ft (preferably longer).



- **Harvesting**
    - Harvest all treatments on the same day.
    - Use a weigh wagon to get the most accurate yield data.
        - Make sure weigh-wagon calibrated prior to harvest season. Start with an empty hopper (prime on surrounding canola and dump) and harvest only the strips as per the swathing recommendations.
        - Measure the exact length and width of the strips. Make sure hopper is empty after each treatment.
        - If there were noticeable differences in maturity between strips, keep a grain sample in a zip lock bag from each strip and measure moisture content later.
        - **Total Bushels** = Weight in pounds ÷ 50
        - **Total Acres Harvested** = (Total Length ft x Total Width ft) ÷ 43,560
        - **Bushels per Acre** = Total Bushels ÷ Total Acres Harvested

The trials were seeded as per protocol at two locations (Barrhead and Fort Assiniboine) but producers at both locations were not able to harvest trial due to weather complications. The details for location are as follows:

Ultimate Canola Challenge Data Collection

GROWER & SITE INFORMATION

Grower Name	Rick Muellar	**City**	Barrhead **Province** Alberta
Grower Address	2421 Twp Rd 593A RR1	**Telephone**	(780)674-6713
Postal Code	T7N 1N2	**Cell phone**	(780)305-9517
Season Zone (S,M,L)		**Email**	smueller@mcsnet.ca
Canola Council Contact	Dan Orchard		

Planting Date (DD-MMM-YY)	15-05-2016			**Legal Land Loc**	SW 32 59 2 W5	
GPS Coordinates				**Seed Drill Type:**	1820 Paired row John Deere	
Applied Fertility (lb/ac)	30	10	30 lbs Actual/ac	**Drill Width (ft)**	36 feet **Row Width (in)**	10"
	P	K	S	**Organic Matter (%)**	5.9%	
				Residual Fertility (H, M, L)	M	

Soil Type

- ☐ Sand
- ☐ Clay
- ☑ Loam
- ☐ Silt
- ☐ Silty Loam
- ☐ Sandy Loam
- ☑ Clay Loam
- ☐ Heavy Clay
- ☐ Sandy Clay
- ☐ Silty Clay

Previous Crop

- ☐ Wheat
- ☐ Barley
- ☑ Peas
- ☐ Oats
- ☐ Durum
- ☐ Fallow

Other

Tillage Type

- ☑ Conventional
- ☐ IDS
- ☐ DS

Crop Residue

- ☐ Light
- ☐ High
- ☑ Moderate

Swath Operation

- ☐ Straight-cut
- ☑ Swathed

Seeding Information

Canola Variety Planted	L-241C
Seeding Rate	5.0 lbs/ac
Seeding Depth	1/2"
Seeding Speed	4.5 MPH

Plant Stand Counts (Plants/ft^2 20 - 25 days after seeding)

	Location 1	Location 2	Plant Ht (CM)	Plant Ht (CM)
Rep 1 Check	16	18	132	137
Rep 1 Treatment	33	22	132	134.5
Rep 2 Check	15	15	132	127
Rep 2 Treatment	17	15	127	129.5
Rep 3 Check	14	14	127	124.5
Rep 3 Treatment	17	18	124.5	122
Rep 4 Check	21	17	132	127
Rep 4 Treatment	29	30	124.5	129.5

NITROGEN APPLICATION INFORMATION

Product	Check Strip Actual N/ac	Check Strip N$/ac	Treatment Strip Actual N/ac	Treatment Strip N $/ac
Urea 46-0-0-0			25 lbs/ac	
Anhydrous Ammonia in fall	70 lbs Actual N /Ac		70 lbs Actual N /Ac	

PESTICIDE INFORMATION

	Product	Rate (l/ac)	$/ac	Crop Stage	Date (DD-MMM-YY)
Pre-seed	Roundup	0.5	$ 3.25		21-05-2016
In-crop					
Fungicide/Insecticide					

Gateway Research Organization

Ultimate Canola Challenge Data Collection

GROWER & SITE INFORMATION

Grower Name	Tylar Thompson	City	Fort Assiniboine Province Alberta
Grower Address	Box 57 Fort Assiniboine, AB	Telephone	(780)584-2244
Postal Code	T0G 1A0	Cell phone	(780)674-1565
Season Zone (S,M,L)		Email	bart5farm@live.com
Canola Council Contact	Dan Orchard		
Planting Date (DD-MMM-YY)	31-05-2016	Legal Land Loc	NE 19 62 6 W5
GPS Coordinates		Seed Drill Type:	1870 Conserva pack John Deere
Applied Fertility (lb/ac)	12 13 12	Drill Width (ft)	56 feet Row Width (in) 12"
	P K S	Organic Matter (%)	2.9%
		Residual Fertility (H, M, L)	L

Soil Type
- ☐ Sand
- ☐ Clay
- ☐ Loam
- ☐ Silt
- ☐ Silty Loam
- ☐ Sandy Loam
- ☐ Clay Loam
- ☐ Heavy Clay
- ☐ Sandy Clay
- ☐ Silty Clay

Tillage Type
- ☑ Conventional
- ☐ MDS
- ☐ DS

Crop Residue
- ☐ Light
- ☑ High
- ☐ Moderate

Previous Crop
- ☐ Wheat
- ☑ Barley
- ☐ Peas
- ☐ Oats
- ☐ Durum
- ☐ Fallow

Swath Operation
- ☐ Straight-cut
- ☑ Swathed

Other

Seeding Information

Canola Variety Planted	L-135
Seeding Rate	3.5 lbs/ac
Seeding Depth	3/4"
Seeding Speed	4.0 MPH

Plant Stand Counts (Plants/ft^2 20 - 25 days after seeding)

	Location 1	Location 2	Plant Ht	Plant Ht
Rep 1 Check	19	20	124.5	139.5
Rep 1 Treatment	23	14	127	137
Rep 2 Check	20	26	124.5	132
Rep 2 Treatment	16	21	124.5	134.5
Rep 3 Check	20	19	129.5	132
Rep 3 Treatment	29	18	124.5	132
Rep 4 Check	16	19	124	134.5
Rep 4 Treatment	21	20	124.5	134.5

NITROGEN APPLICATION INFORMATION

Product	Check Strip Actual N/ac	Check Strip N$/ac	Treatment Strip Actual N/ac	Treatment Strip N $/ac
46-0-0-0 urea	75 lbs/ac		100 lbs/ac	

PESTICIDE INFORMATION

	Product	Rate (l/ac)	$/ac	Crop Stage	Date (DD-MMM-YY)
Pre-seed	Roundup	0.5	$ 3.25		21-05-2016
In-crop					
Fungicide/Insecticide					

2016 Heifer Pasture Summary

Coordinator: **Rick Tarasiuk,** Crop Field Technician

Location: Heifer Pasture SE-23-61-26 W4

Stocking Rate: 81 heifers & 2 bulls;

Contributors:

Richard Geiger	**Matt Haisen**
Don Petryshen	**Calvin & Anita Wruk**
Maurice Kruk	**Bruinella Mitchell**
George Kerckhof	**Beau Lyons**
Bob Mellor	**Charlotte Neggers**

Entry Date: June 15, 2016

Exit Date: October 4, 2016

Objectives:

1. To demonstrate a rotational grazing system and its effect on carrying capacity.
2. Provide a site for further research and producer learning activities.

History & Field Design

The pasture was established in 1979 and was originally used for steers. In 1988, the first heifers were put into the pasture and have remained ever since. The 160-acre pasture is split into 16 paddocks; approximately 10 acres each. There is a central watering/ loafing area as well as a handling facility. The perimeter is fenced with 4 double strand barbed wire, and cross fencing is done with 2 single strand barbed wire that is powered with a solar electric fence. Each paddock is rotationally grazed to allow alternate periods of grazing and rest. If managed properly, these rest periods allow the grass a chance to

replenish nutrients after defoliation and, therefore, increase grass production. In a continuous grazing situation some forage resources are continually stressed (no rest); while others may be underutilized as the animals will repeatedly graze the most palatable species. In this situation the preferred species will begin to decline and less palatable species or weeds will begin to dominate the pasture. In 2015, Rick worked on to fix the much-needed repair for fencing as well as solar panels.

Water: In September 2002, the dugout and Dutch Industries windmill water system were replaced with a free flowing well delivering a rate of approximately 2 gal/min (cut back from 4 gal/min). A 580-gallon poly trough was installed with an over-flow pipe to prevent over filling, and spillage into the watering area. In 2015, the whole water supply system was repaired and fixed for any leak issues.

Herd Health: All heifers were weighed and inspected for overall health and soundness on entry and exit days. All animals were vaccinated for Hoof-rot vaccine at the entry day. CyLence® pour-on insecticide was also applied at entry during weigh in for pasture fly control. All livestock were fed pasture blend of loose mineral and granular Panacur (to treat for internal parasites) as per products indications. In 2016 overall, there was no issues with the health for the heifers during their stay at our pasture, except one heifer was separated from herd and treated for Pink eye before returning back to herd.

Breeding: Two black Angus bull owned by contributor Gary Petryshen were used in the pasture. Bulls entered heifer pasture at the same time as the heifers (June 15) and remained in the pasture until the exit day. The heifers were palpated for pregnancy upon exit, it was determined that the overall open rate was 4.8% i.e., 4 out of 83 heifers.

Grazing: The order that the paddocks were grazed was determined by the quantity of growth and species composition on a visual inspection. Two Paddock was grazed extensively earlier in the rotation and were direct seeded with either a various cocktail mixes of grass and legumes using no till JD drill. The following table include the details of the cocktail combination seeded in 2016.

Table 2.1 Heifer Pasture Cocktail mix

Mix 1		**lbs of seed**	Seeded at 17.7 lbs/ ac
Italian rye grass		11.6	
Winfred		1	
Goliath		1	
Hunter		1	
Graza		1	
Rye grass		4	
cicer		2	
Clover Red Belle		2	
Sanfoin		3	
Clover sweet Norgold		2	
	Total	17 lbs/ ac	
Mix 2		**lbs of seed**	seeded at 23.2 lbs/ ac
Orca Orchard grass		6	
Bellevue Canary grass		6	
Danegro annual rye grass		6	
Fojtan festulolium		6	
Perseus festulolium		6	
Mathilde perennial rye grass		6	
Intermediate wheat grass		6	
Duramax tall fescue		6	
	48 lbs		
Mix 3		**lbs of seed**	Seeded at 17.4 lbs/ac
Intermediate wheat grass		4	
Duramax tall fescue		4	
Fojitan festulolium		2.5	
Perseus festulolium		4	
Mathilde perrennial rye grass		4	
Bellevue reed canary grass		4	
Dawn alsike clover		4	
Belle double cut red clover		4	
Norgold sweet clover		4	
Sanfoin		5.5	
		40	
Mix 4		**lbs of seed**	Seeded at 45.5 lbs/ac
Equimaster II		53.1 lbs	

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Discussion

The GRO Heifer Pasture was established in 1979, making the pasture 35 years old, which is a well-aged pasture. The pasture was originally seeded to a mixture of grasses and legumes, but is now predominantly meadow foxtail. A variety of other grass species including orchard grass, timothy, meadow brome and other brome species can still be found out on pasture. In terms of forbs or legume type species, these are limited on the pasture with some paddocks having no broad leaf species other than Canada thistle. Stem mining weevils were introduced to control Canada thistle and the effect will be monitored for their efficacy in 2016 and 2017 fall. The species that do still exist in some of the paddocks are clovers, alfalfa and cicer milkvetch. The establishment of cocktail pasture mix at GRO pasture will be closely monitored and efforts for pasture rejuvenation will be continue in coming years.

Table 2.2 Heifer Pasture Paddock Size (acres)

Paddock	Size (ac)	Paddock	Size (ac)
R1	8.90 ac	Y1	9.53 ac
R2	9.53 ac	Y2	10.36 ac
R3	9.50 ac	Y3	9.93 ac
R4	10.49 ac	Y4	9.75 ac
R5	10.25 ac	Y5	10.15 ac
R6	10.35 ac	Y6	9.04 ac
R7	9.14 ac	Y7	9.50 ac
R8	9.82 ac	Y8	9.81 ac

GRO Heifer Pasture Map

North

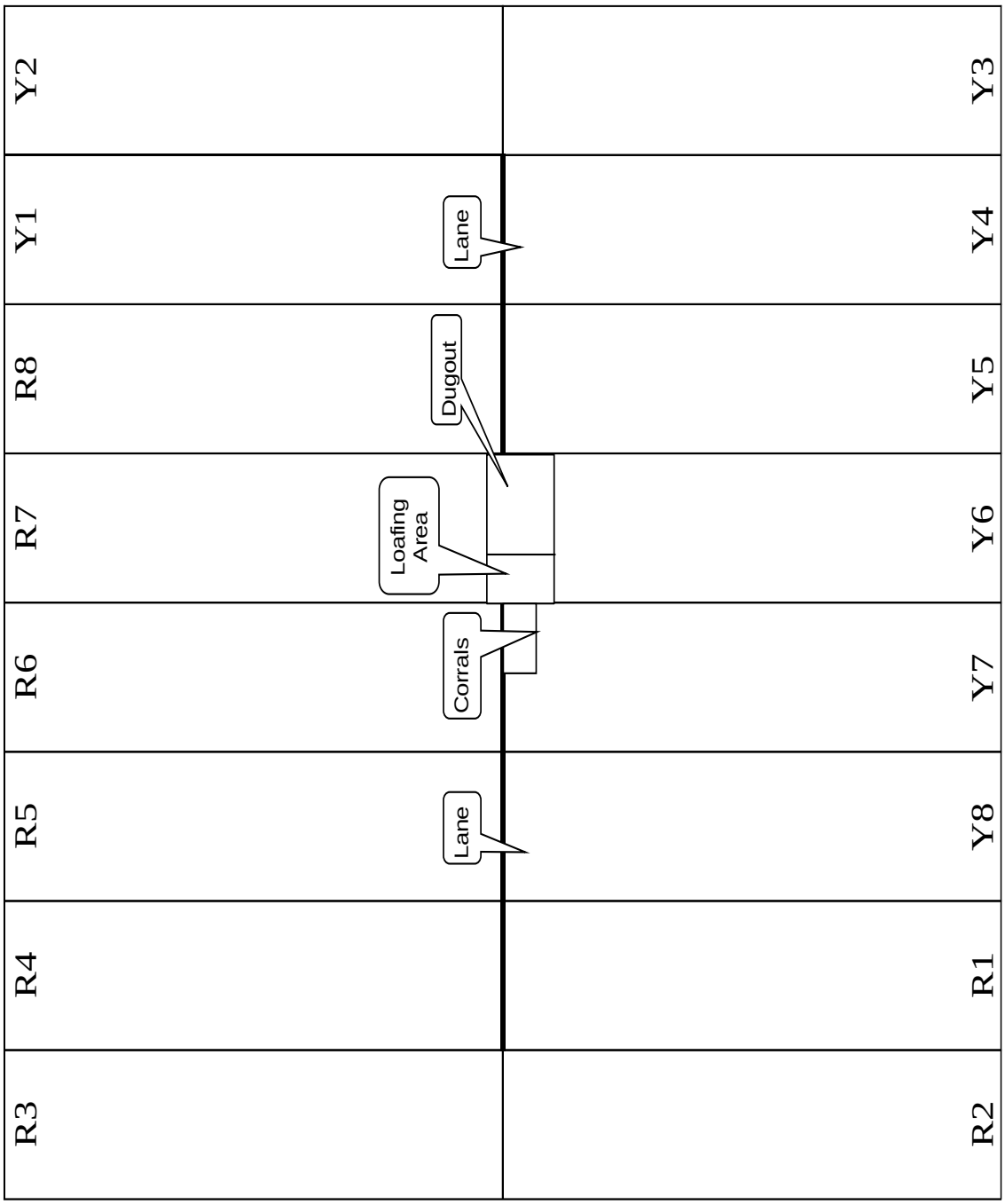

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Table 2.3 Summary of Production (1988-2015)

Year	Entry Weight	Exit Weight	Gain (lbs.)	ADG (lbs.)
1988-2004	922	1124	208	1.74
2005	891	1059	168	1.44
2006	907	1083	176	1.38
2007	873	1117	244	1.82
2008	843	1106	263	1.98
2009	869	1073	204	1.73
2010	913	1049	136	1.08
2011	953	1134	181	1.62
2012	867	1052	185	1.39
2013	928	1146	218	1.70
2014	919	1098	179	1.50
2015	959	1126	167	1.59
2016	900	1089	189	1.62
Average	**905**	**1099**	**194**	**1.58**

Table 2.4 Heifer Pasture Precipitation in Inches

Year	May	June	July	August	September	October	Total
1988-2004	1.11	2.67	3.21	2.24	0.78	0.36	9.17
2005	1.44	4.08	1.64	1.20	0.56	0.80	9.72
2006	4.50	3.12	1.36	2.28	1.76	0.12	13.14
2007	3.10	5.36	2.52	1.10	0.72	0.04	12.84
2008	3.60	2.04	3.60	1.40	0.96	0.00	11.60
2009	0.18	0.39	3.43	1.06	0.74	--	5.80
2010	1.54	1.69	1.64	2.06	1.00	0.10	8.01
2011	0.03	3.32	0.48	0.98	0.41	0.02	5.24
2012	--	1.63	4.77	1.47	0.61	0.26	8.74
2013	1.16	2.68	3.26	2.98	0.98	0.89	11.95
2014	1.57	2.16	4.33	2.08	0.86	0.47	11.49
2015	1.64	3.26	3.67	2.50	1.39	0.71	1.64
Average	**1.65**	**2.64**	**2.74**	**1.71**	**0.85**	**0.30**	**9.79**

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Regional Silage Trial

Cooperator: jubilee feedlot

Location: SW 14-60-27 W4

Objectives

1. Compare silage yield and nutritional value of new and commonly used barley, oat and triticale silage varieties.
2. To provide yield and agronomic data for use in the Alberta Agriculture publication "Silage Varieties for Alberta."

Background

A randomized complete block with 4 replicates of each treatment was used. Plot size was 1.37 metres wide (6 rows with 9 inch spacing) by 6 meters long. Silage was harvested, samples were weighed and sent for wet chemistry analysis to obtain moisture and feed quality.

Seeding Rates

Seeding rates were based on 1000 kernel weight and germination in order to achieve 22, 24 and 30 plants per square foot for barley, oat and triticale respectively. It is very important to calculate seeding rates using this method (using germination % and 1000 kernel weight) to prevent under or over seeding. Crops with larger seed size have fewer seeds per pound/bushel. They need to have more pounds/bushel seeded per acre to keep viable seed counts the same as crops with small seed size.

Table: 1 : Project description

Action	Barley Silage	Oat Silage	Triticale Silage
Seeding	May 21	May 21	May 21
Seeding Specifics	Depth: 1 inch Row Spacing: 9 inches		
Plot Activities	1. Cultivated and harrowed prior to seeding 2. In crop herbicide		
Equipment	Fabro zero- till drill with atom jet openers		
Fertilizer applied	58 lbs/ac (32-14-0-4)		
Herbicides applied	(Prestige A+B) on 2015-06-25		
Precipitation (mm)	404		
Harvest Stage	soft dough stage	late milk stage	Early dough stage
Harvest date	July 30	August 07	August 12

Table 2: Barley Silage varieties at Westlock.

Variety	Yield Tonne/acre @65% moisture	Crude Protein	Total Digestible Nutrients
CDC AUSTENSON	12.5	8.6	64.8
AMISK	12.0	7.1	62.9
CANMORE	11.2	8.2	64.0
CDC COALITION	12.1	8.0	65.6
CDC COWBOY	12.0	7.3	62.5
CDC MAVERICK	11.8	7.0	63.2
CDC MEREDITH	11.3	7.7	64.7
CHAMPION	12.0	7.8	65.7

CONLON	11.8	8.6	65.5
GADSBY	11.0	7.5	62.5
SUNDRE	10.7	7.4	65.2
CLAYMORE	12.0	8.3	63.0
TR13740	11.7	7.7	64.5
CV	5.02		

Table 3: Oat Silage varieties at Westlock.

Variety	Yield Tonne/acre @65% moisture	Crude Protein	Total Digestible Nutrients
CDC BALER	11.2	7.1	59.2
AC MORGAN	10.8	8.0	61.5
AC MUSTANG	10.7	7.4	60.0
CDC HAYMAKER	11.5	6.9	59.6
CDC SO-I	10.4	6.4	61.5
CDC SEABISCUIT	12.1	6.6	61.8
DERBY	11.8	5.8	61.4
AC JUNIPER	10.9	7.1	63.1
MURPHY	11.8	6.7	57.3
WALDERN	12.1	6.1	60.3
CV	10.6		

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Table 4: Triticale Silage varieties at Westlock.

Variety	Yield Tonne/acre @65% moisture	Crude Protein	Total Digestible Nutrients
TAZA	**10.8**	8.9	63.0
94L043057	**11.8**	**9.2**	**64.7**
BUNKER	**11.5**	8.2	63.3
SUNRAY	**11.8**	8.2	64.4
TYNDAL	**11.8**	8.0	61.8
CV	6.7		

Pest Monitoring & Disease Survey Summary 2016

RPT_DSCRPT	AAC PENHOLD	AAC RYLEY	AAC FORAY	KWS SPARROW	KWS CHARING	KWS BELVO
Dry Analysis						
Acid Detergent Fibre	21.5	35.17	24.81	18.06	19.6	
Moisture	0	0	0	0	0	
Calcium	0.14	0.21	0.16	0.12	0.09	
Copper	3.68	3.23	4.02	3.78	4.04	
Iron	62.6	63.3	55.4	52.65	56.05	
Potassium	0.84	0.9	0.74	0.95	0.75	
Magnesium	0.14	0.15	0.13	0.14	0.11	
Manganese	28.34	12.92	19.46	29.28	30.22	
Sodium	0.01	0.01	0.01	0.06	0.02	
Phosphorus	0.23	0.13	0.18	0.24	0.28	
Sulphur	0.12	0.1	0.12	0.13	0.11	
Soluble Crude Protein	53.48	52.39	46.29	58.64	52.4	
NFC	42.68	23.13	38.27	45.47	44.29	
NDF-CP	1.23	1.49	1.31	1.96	1.18	
ADF-CP	0.89	0.75	1.21	0.83	0.72	
UIP (Bypass Protein)	23.26	23.8	26.86	20.68	23.8	
Crude Protein	9.48	6.89	7.95	9.38	8.13	
Dry Matter	100	100	100	100	100	
Total Digestible Nutrients	72.15	61.5	69.57	74.83	73.63	
NE Gain	1.08	0.78	1.01	1.16	1.13	
NE Lactation	1.65	1.39	1.59	1.72	1.69	
NE Maintenance	1.81	1.5	1.73	1.88	1.85	
Relative Feed Value	185	98	153	207	190	
Neutral Detergent Fibre	36.34	58.48	42.28	33.65	36.08	
Zinc	19.86	12.5	14.56	17.37	17.38	

The Gateway Research Organization (GRO) participated in the Prairie Pest Monitoring Program in 2016. The objective of the Prairie Pest Monitoring Program is to develop an early warning system for crop pests, with emphasis on insects and disease. Being forewarned means that scouting, information workshops and control operations can be carried out in the affected areas before crop losses occur. Last year, GRO surveyed for diamondback moth, bertha armyworm.

Diamondback Moth

Two pheromone traps on the edge of a canola field in Westlock County were used to monitor adult diamondback moth populations from April 26 to June 06. Traps were checked weekly and moth counts, along with counts from other locations, were used to

generate forecast maps and assess the risk of a larval outbreak. These maps were updated daily and can be accessed on Alberta Agriculture, Food and Rural Development's website.

Bertha Armyworm

Two pheromone traps on the edge of a canola field in Westlock County were used to monitor bertha armyworm moth populations from June 14 to July 18. Traps were checked weekly and the counts, along with counts from other locations, were used to generate forecast maps and assess the risk of a larval outbreak. These maps were updated daily and can be accessed on Alberta Agriculture, Food and Rural Development's website. Cumulative moth counts in Westlock County 32 and 26 per trap. These counts indicate a low risk for a larval outbreak and therefore no larval surveying was completed.

Special thanks to Anne Van Loon and Mairi McEwen, Summer Student at the Gateway Research Organization, for assistance with pest surveying.

Gateway Research Organization

INSECT SURVEY RESULTS - 2016 GRO

BERTHA ARMYWORM (BAW)

Bertha armyworm is very cyclical. In order to catch outbreaks and help producers minimize losses it is necessary to maintain a good monitoring system using pheromone traps. The number of moths caught in the traps informs us of the risk of damaging populations with a 3 to 5 week lead time. These numbers are generated from paired pheromone traps in individual fields, except in the Peace River region where only 1 trap is used to reduce impact on native pollinators.

Bertha armyworm populations are normally kept in check by such factors as weather and natural enemies. Potential damage may be more or less severe than suggested by the moth count data depending on weather and crop conditions and localized population dynamics. Research has clearly shown that very few fields are ever affected in an area with moth catches less than 300. Even at higher moth counts field scouting is critical for pest management decisions because experience has shown that field to field and even within field variations can be very large.

DIAMONDBACK MOTH (DBM)

It is generally accepted that diamondback moth adults don't overwinter in the prairies and that most infestations occur when adult moths arrive on wind currents in the spring from the southern or western United States or northern Mexico. In mild winters there is suspicion that diamondback moth do overwinter in Alberta.

To assess the population, a network of 35 monitoring sites has been established across the province. This network is meant to act as part of an early warning system for diamondback moth and should be used in conjunction with crop scouting.

WHEAT MIDGE (WM)

Wheat midge is an insect that increases in numbers in wet years. Numbers can vary drastically from field to field and we try to sample wheat adjacent to the previous years' wheat in order to pick up populations if they are present. There is no definitive way to know exactly the risk in any given field so field scouting when the wheat comes into head is critical. The numbers shown here give a general trend of midge populations. Individual fields will have a different risk.

These numbers are generated by taking soil samples from wheat fields after harvest using a standardized soil probe.

Alberta Insect Pest Monitoring Network

Barrhead

Bertha armyworm (BAW)

LLD	Trap total	Trap average
SE-15-60-2-W5	110	55

Reporting period: June 6-July 17, 2016

Diamondback Moth (DBM)

LLD	Trap total	Trap average
SE-15-60-2-W5	94	47

Reporting period: May 1-June 5, 2016

Wheat Midge (WM)

Quarter	Section	Township	Range	Meridian	Viable	Not Viable	Parasitoid	Total
ne	34	59	3	5	2	0	1	3
se	36	58	4	5	0	0	0	0
nw	13	59	3	5	0	0	0	0
sw	3	62	3	5	1	0	0	1

Westlock

Bertha armyworm (BAW)

LLD	Trap total	Trap average
SW-12-60-27-W4	114	57

Reporting period: June 6-July 17, 2016

Diamondback Moth (DBM)

LLD	Trap total	Trap average
SW-12-60-27-W4	84	42

Reporting period: May 1-June 5, 2016

Wheat Midge (WM)

Quarter	Section	Township	Range	Meridian	Viable	Not Viable	Parasitoid	Total
nw	9	62	2	5	2	0	0	2
ne	8	62	25	4	0	0	0	0
nw	4	61	23	4	1	0	0	1
ne	18	58	26	4	0	0	0	0

Woodlands

Wheat Midge (WM)

Quarter	Section	Township	Range	Meridian	Viable	Not Viable	Parasitoid	Total
nw	22	62	6	5	0	0	0	0

The risk level as shown on our maps is as follows:

- 0 midge will be displayed as light grey (No infestation)
- 2 or less midge will be shown as dark grey (<600/m^2)
- 3 to 5 will be shown as yellow (600 to 1200/m^2)
- 6 to 8 will be shown as orange (1200 to 1800/m^2)
- 9 or more will be shown as red. (>1800/m^2)

GRO

Alberta Insect Pest Monitoring Network

Feb 15, 2017

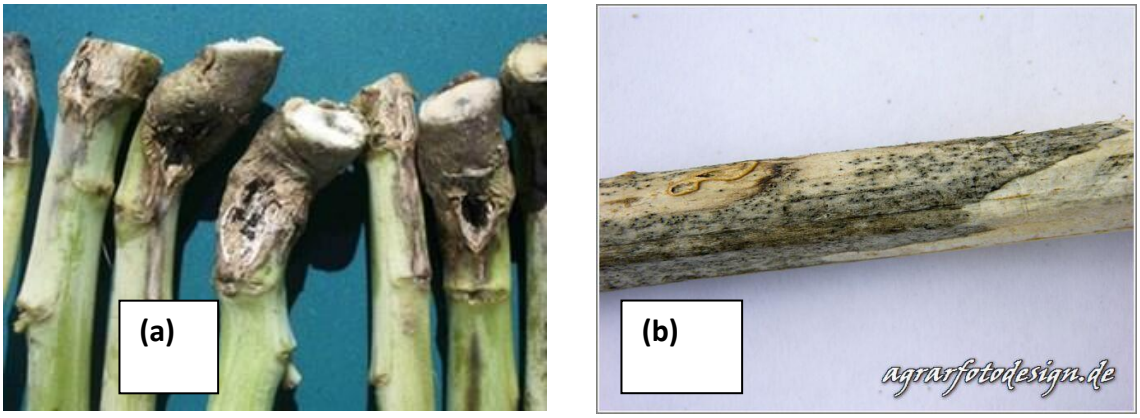
Gateway Research Organization

In November 2014, the Canadian Food Inspection Agency (CFIA) confirmed the presence of Verticillium Wilt (*Verticillium longisporum*) on canola at a single location in Manitoba. This pest has not been previously reported in Canada and is regulated as a quarantinable pest under the Plant Protection Act (PPA). Under authority of the PPA, the Canadian Food Inspection Agency (CFIA) has requested that stem samples be collected from canola producing provinces as part of a survey to determine the incidence of this soil-borne fungus across Canada. GRO participated in this survey to assist CFIA in profiling the current distribution of this disease across Canada. This disease has the potential to devastate the canola industry of Alberta (refer to the CFIA Risk Assessment). The survey took place in late August, before swathing, when disease symptoms are most apparent. Diseased and healthy plant samples, as well as soil samples, were collected in each field and were sent to the project coordinator for analysis.

Things to consider, if you want to survey for verticillium wilt in Canola.

- Timing of survey: Microsclerotia production is highest when the plant is senescing. Survey the field just prior to, or immediately after, swathing when full plant wilt symptoms will be most evident.
- Symptoms: The symptoms of Verticillium wilt includes: premature leaf fall; necrosis; a reduction in stem diameter and stunting; discolouration in the leaves; chlorosis; abnormal leaf fall; wilting; internal discolouration; and blackening as microsclerotia appear. Some symptoms may be similar to other diseases.
- Common identification mistakes: Verticillium wilt may be difficult to distinguish from blackleg (*Leptospaeria maculans*) due to similar blackening of the stem. To distinguish between the two, cut a cross section of the stem at ground level. Blackening in the middle of the stem signifies blackleg, while no blackening in the middle of the stem signifies Verticillium wilt (Canola Council, 2014). Verticillium wilt may also be mistaken for sclerotinia stem rot. Verticillium wilt presents only

tiny microsclerotia while sclerotinia stem rot presents large, sclerocia inside of the stem (Canola Council, 2014). Please refer to the appendix for images of



Verticillium wilt.

- Conditions: Verticillium wilt is more pervasive under dry soil conditions (19°c-23°c). When the xylem and phloem tissues are under stress the fungus may more easily penetrate the vascular system. Damaged roots are also more vulnerable to penetration of the disease (Canola Council, 2014).

Figure 1: Blackleg infected stalk. (a) Stem interior. (b) Stem exterior. (Note: Verticillium lodges not have a blackened stem interior).

(b)

Figure 2: Verticillium Wilt. (a) Stem discoloration. (b) Microsclerotia on stem exterior

Blackleg/Verticillium wilt survey detail:

Date Sampled	Date Submitted	Land Location
Sept 19, 2016	Sept 20	Barrhead (3)
Sept 19, 2016	Sept 20	Woodlands (1)
Sept 26, 2016	Sept 28	Athabasca (3)
Sept 26, 2016	Sept 28	Westlock (4)
Sept 27, 2016	Sept 28	Thorhild (2)
Oct 3, 2016	Oct 4, 2016	Lac st Anne (1)
Oct 3, 2016	Oct 4, 2016	Parkland (1)
Oct 6, 2016	Oct 6, 2016	Sturgeon (4)

The results for the above samples are not yet clarified. So please contact GRO staff for a follow up with the above sampling program.

NOTE: GRO works with producers collaboration so if you are interested in participating in any of sampling program. Please call GRO office at 780-349-4546 to express your thoughts.

Gateway Research Organization

Regional Winter Wheat Variety Trials

Co-operators: Jubilee Feedlot – SW-12-60-27 W4

Objectives: To provide yield and agronomic information of current winter wheat varieties as well as newer varieties to producers in west central Alberta.

Introduction

Variety testing continues to be important in providing producers with information on the performance of newly registered and established varieties. Winter wheat varieties, when managed well, have the potential to out yield spring wheat by 15-40 per cent.

	RVT - Project Description
Seeding Date	Sept 23, 2015
Seeding Specifics	Fabro zero till drill
Seeding Rates:	Seeding Depth: 1 inch; Previous crop: Barley
Moisture	250 plants/m^2 – Winter Wheat
	404 mm
	RVT - Project Description
Fertilizer/ac	195 lbs/Acre 46-0-0-0: Applied based on soil test
Herbicide	MCPA 0.45 L/Ac – 01-Jun
Harvest Date	Aug 08 2016

Results

When selecting a variety that is best suited for your farming operation, please make sure to consider other traits data from Alberta seed guide for winter hardiness, disease resistance, market opportunities, and lodging resistance. To find the variety best suited to our area, especially for yield potential and protein level, check the results mentioned below.

The lodging and maturity data was also noted down for the trial. There was no significant difference for the lodging and maturity time data for any of the variety.

Gateway Research Organization

	Variety	Plant Height (cm)		Yeild (Bu/Acre)		Protein (%)
1	**AC Radiant**	67.7	abc	85.1	abc	11.2
2	**CDC Buteo**	64.3	a-d	78.9	bc	12.0
3	**AC Flourish**	55.7	e	75.1	c	11.2
4	**Moats**	66.7	a-d	83.8	abc	11.3
5	**AC Emerson**	65.7	a-d	78.2	bc	11.9
6	**AAC Gateway**	59.0	de	77.0	bc	12.2
7	**CDC Chase**	63.3	a-d	78.8	bc	11.8
8	**AAC Elevate**	65.7	a-d	85.5	abc	10.7
9	**AAC Wildfire**	61.7	cde	88.6	ab	10.3
10	**AAC Icefield**	61.0	cde	85.5	abc	10.0
11	**Pintail**	62.3	b-e	81.7	abc	9.0
12	**Sunrise**	70.0	ab	**92.2**	a	10.2
13	**Swainson**	70.7	a	**92.8**	a	9.7
14	**W520**	60.7	cde	89.7	ab	10.4
	CV	4.9		5.4		

The yield results from GRO plot in year 2016 indicates that **Sunrise and Swainson were two highest yielding** winter wheat. They were the tallest variety too. The CDC Buteo, AC Flourish, AAC Gateway, and CDC Chase were lower yielding varieties in 2016. The rest of varieties were at intermediate level for yield performance. The AAC Gateway was at highest protein (12.2%) concentration for 2016.

Acknowledgement: Many thanks to Agriculture and Agri-Food Canada and Western Winter Wheat Initiative for their timely support.

Gateway Research Organization

HIGH LEGUME PASTURES

Creating profit above ground and wealth below. **2016/2017**

High Legume Pastures...

- increase calf and yearling weight gains or cow body condition scores.
- extend pasture productivity beyond the "summer slump" of tame grasses.
- fix nitrogen to reduce fertilizer costs and increase forage production and profit.
- provide root systems to different profiles in the soil, therefore increasing utilization of soil moisture and increasing carbon capture depths.
- are more drought averse.

AAC Mountainview Sainfoin...

- is a no-bloat legume containing tannins that can greatly reduce the risk of bloat from alfalfa when in a mixed stand.
- was developed by Dr. Surya Acharya, AAFC, Lethbridge.
- has a similar growth and regrowth pattern to alfalfa.
- competes with alfalfa, ensuring it stays in the pasture longer to provide bloat control.

Take away lesson from 2016 field days: **When establishing forages, seedbed preparation is key.** Ensure the seedbed is firm prior to seeding using harrow packers or equivalent.

"After close to thirty years working as a forage specialist, I don't think I have ever seen a seedbed too firm prior to seeding a perennial forage stand. But you do need some loose dirt to cover the seed." Lorne Klein, Saskatchewan Ministry of Agriculture

Sainfoin & Alfalfa Seedlings - Consort, AB

Goal was 60% legume establishment in the pasture.

Ultimate Pasture Mix consists of 30% AAC Mountainview Sainfoin and 70% Haygrazer Alfalfa.

Remaining 40% grass/legume was choice of the producer.

In cooperation with ten forage and applied research associations, thirteen producers across Alberta, through the Agricultural Research and Extension Council of Alberta (ARECA), and in consultation with high legume grazing mentors with financial and economic analysis, Alberta Agriculture and Forestry (AF) staff are coordinating a two year field trial to demonstrate the potential of sainfoin in a high-legume pasture mix on field scale level.

Alberta Government

Gateway Research Organization

2016 Summer Events

During the summer of 2016, ten events were co-hosted with project teams. In addition to hearing from cooperating producers and seeing the progress in the fields, grazers with many years of involvement in using higher legume pastures came to share their experiences and answer questions at each field day. These "Grazing Mentors" had provided multiple years of economic and financial data to the AgriProfit$ program for analysis and could speak to not only their experience, but also how it affected their financial bottom line .

Site Establishment Update (Sept 2016)

2 Rated **'Excellent'**

2 Rated **'Okay'**

5 Rated **'Fair'***

2 Rated '**Poor**'*

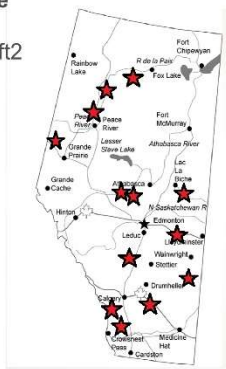
33% of attendees gained confidence in establishing a high legume pasture in their operations.

* forage stand touch-up happened in one stand in fall 2016. Other stands will be touched-up Spring 2017.

Field day participants were provided a questionnaire at the start of the day asking how confident they were about grazing high legume pastures. Below is a summary:

After the field day an evaluation was provided and participants were asked how confident they were about grazing high legume pastures. Below is the summary

Stand Establishment Forage Plant Count:
Excellent = **6+** forage plants/ft2
Okay = **3-5** forage plants/ft2
Fair = **2** forage plants/ft2
Poor is less than **1** forage plant/ft2



Province-wide Project

FFGA: Longview
FFGA: Gleichen
MARA: Fort Vermilion
MARA: Buffalo Head Prairie
GRO: Fort Assiniboine
WCFA: Barrhead
GWFA: Lacombe
LARA: Iron River
CARA: Consort
PCBFA: Fourth Creek
BRRG: Holden
NPARA: Manning
FS: Granum

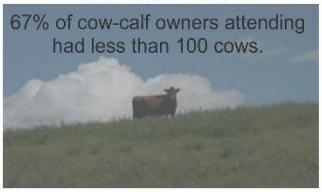
Watch for more on establishment, and look forward to grazing stories in 2017!

Sheep grazing the newly established site at Stein's (West Central Forage Association) November 2016. The stand establishment is rated as excellent. No sheep bloated.

50% attended the field days because they heard about it through their local forage/research association. We are working in the right circles to effectively extend this information.

Foothills Forage & Grazing Association Field Day August 24, 2016

Over 300 attendees at the 10 events.



80%

of attendees were very satisfied with the event and no one was dissatisfied.

Gateway Research Organization

Update of GRO site 2016

Seeding Date: June 07, 2016

Seeding Area: 10 acre

Equipment: Air-drill with flexicoil

Fertility: N 13 - P 16 - K 12 - S 12 lbs/ac

- 60 lbs/Ac with Legume Mix + 60 lbs/Ac with Grass mix (Side banded)

Spray : July 12 (Basagram forte 0.7 L/Ac)

Mowing: July 29

Moisture: 495 mm

Legume Mix: 3.3 lbs/Ac **60% of total pasture**

AAC Mountainview Sainfoin
Hay Grazer Alfalfa

Grass Mix : 2.7 lbs/Ac **40% of total pasture**

40% Meadow Brome
20% Tall Fescue
10% Orchard grass
5% Timothy
15% Creeping red
10% Alfaalfa

Picture taken at Sainfoin tour day August 08, 2016 at Fort Assiniboine site

The site will be again touched up with additional rate of 3.3 lbs/Acre in early April, 2017 with Legume mix of Sainfoin + Alfalfa. The site establishment will be monitored and if possible grazing will be included in trial.