PCDF

Parkland Crop Diversification Foundation

2018 ANNUAL REPORT

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Introduction

PCDF received importing funding from the Growing Forward 2 and Agriculture Sustainability Initiative (ASI) programs, as well as from trial cooperators, producers, and members of the local community. PCDF is always open to project ideas and learning about the production concerns of local producers, so please feel free to contact us with any project proposals. For project submissions or additional information, please refer to the Contact info supplied on this website.

2018 Cooperators

Agricultural and Agri-Food Canada
Canadian Hemp Trade Alliance
Cibus Canola
Crop Development Centre
Hemp Genetics International
Linseed Coop
Manitoba Agriculture
Manitoba Crop Variety Evaluation Team
Manitoba Diversification Centres
Northern Quinoa
Parkland Coop
Parkland Crop Diversification Foundation
Parkland Industrial Hemp Growers
Pepsi Quaker Oats
Pioneer Corn
Phillex Quinoa
Tamarack Farms
University of Saskatchewan
Western 6-Row Barley Cooperative

2018 PCDF Board of Directors

<u>Executive</u>		
Robert Misko	Chair	Roblin
Mark Laycock	Vice-Chair	Russell
Laurie Radford	Secretary	San Clara
Cynthia Nerbas	Treasurer	Russell
<u>Members</u>		
Jeremy Andres		Roblin
Doug Cranwell		Roblin
Rod Fisher		Dauphin
Dale Gryba		Gilbert Plains
Boris Michaleski		Dauphin
John Sandborn		Benito
Keith Watson		Dauphin

2018 Meteorological Data

Table 1: Roblin 2018 Season Report by Month (based on 30 year average)

Month	Precipitation		Corn Heat Units		Growing Degree Days	
	Actual	Normal	Actual	Normal	Actual	Normal
April	6	24	66	33	29	7
May	77	45	453	321	268	172
June	187	73	597	530	366	314
July	93	71	627	645	382	392
Aug	19	56	542	587	340	354
Sept	40	53	187	292	103	163
Oct	27	26	28	42	7	11

Information gathered from Manitoba Agriculture Growing Season Report website at http://tgs.gov.mb.ca/climate/SeasonalReport.aspx

Table 2: Roblin 2018 Season Summary April 1 – October 31

	Actual	Normal	% of Normal
Number of Days	214	-	-
Growing Degree Days	1498	1415	106
Corn Heat Units	2394	2452	102
Total Precipitation	451	350	129

2018 Extension Activities

Name	Medium	Date	Location
Ag Days	Booth	January	Brandon
Roblin Review	Print Article	January	Have you Heard of Haskaps?
CropConnect	Booth	February	Winnipeg
Organic Roundtable	Group Dialogue	March	Roblin
Ag in the Classroom	School group tours	April	Russell
Ag in the Classroom	School group tours	June	Brandon
Field Day	Research site tour	July	Roblin
Top Crop Manager	Online article	July	Build a soil nutrient budget for your rotations
Soil Awareness Workshop	Presentation	August	Roblin
Pea-Canola Intercrop Workshop	Presentation	August	Roblin
Manitoba Cooperator	Online article	September	To the Bin or Bust: quinoa a risky proposition
Manitoba Organic Alliance	Online article	October	Intercropping for Diversity and Resiliency
Organic Roundtable	Group Dialogue	December	Roblin

2018 PCDF Field trials

Plot information		**Equipment**
At seeding:	7m x 1.2m	5-Row Fabro Disc Seeder
Trimmed:	5m x 1.2m	Plot Sprayer
Plot Area:	$6m^2$	Wintersteiger Plot Combine
Alleyways:	2m	

Manitoba Crop Variety Evaluation (MCVET) Trials

Manitoba Crop Variety Evaluation Trials (MCVET) facilitates variety evaluations of many different crop types in this province. The purpose of MCVET trials is to grow both familiar (checks or reference) and new varieties side by side in a replicated manner in order to compare and contrast various variety characteristics such as yield, maturity, protein content, disease tolerance, and many others.

During 2018, PCDF did variety evaluations for winter cereals (winter wheat & fall rye), oats, barley, fababeans, and flax. The winter cereals evaluations were discontinued due to spray poor establishment and winterkill, and the fababean evaluations were discontinued because of spray drift.

From each MCVET site across the province, yearly data is collected, combined, and summarized in the 'Seed Manitoba 2018' guide. Hard copies are available at most Manitoba Agriculture and Ag Industry Offices.

Table 1: Summary of 2018 PCDF Trials

Crop Type	Collaborators	Purpose	Number of Entries
Agroforestry	PCDF	Establishment year of orchard for agroforestry	-
Barley	Manitoba Agriculture	Assessment of the current Fusarium Head Blight Risk Model	27
6-row malt barley	Western 6-Row Barley Cooperative	Evaluation of 6-row malt barley lines for registration	18
Barley	Manitoba Agriculture	Determination of optimum seeding rates for barley	10
Corn	Agricultural and Agri-Food Canada	Variety Trial	30
Corn	Agricultural and Agri-Food Canada	Corn Nursery	484
Corn (Sugarcorn)	Agricultural and Agri-Food Canada	Biomass yield and sugar content of stalks	6
Corn	Pioneer	Variety Trial	4

Flax	Manitoba Agriculture	Best management practices for growing flax compared to historical trends	6
Flax	Manitoba Agriculture	Evaluation of European Lines for North American climates	7
Flax	Linseed Coop	Variety Trial	26
Fruit Demonstration	University of Saskatchewan	Sour Cherry and Haskap	10
Green Manure Demonstration	PCDF	Mix of green manure seeds: Japanese Millet, Italian Ryegrass, Chicory, Sugar Beet, Persian Clover and Common Vetch	-
Hemp	Hemp Genetics International	Seed treatment and in-season spray with PGETech eco-friendly growth enhancer	6
Hemp	Parkland Industrial Hemp Growers	Effect of staging the use of plant growth regulators	6
Hemp	Canadian Hemp Trade Alliance	National Industrial Hemp Fibre and Grain Variety Evaluation Trials	13
Hops	Manitoba Diversification Centres	Establishment year of hopyard demonstration	7
Oats	Manitoba Agriculture	Determination of optimum seeding rates for oats	10
Oats	Agricultural and Agri-Food Canada	Evaluation of new oat lines being developed for organic production	25
Oat Cover Crop Relay	PCDF	Oats seeded together alternately with 6 varieties of clover, 3 varieties of grass and 1 vetch	-
Pea Demonstration	PCDF	Demonstration of yellow, green and maple varieties of peas	17
Pea Quinoa Intercrop	Tamarack Farms	Treatments of High and Low Pea and Quinoa seeding rates combined together	11
Quinoa	Phillex Ltd	Variety Trial	5
Quinoa Cover Crop Relay	Tamarack Farms	Quinoa seeded together alternately with 6 varieties of clover, 3 varieties of grass and 1 vetch	11
Six Year Crop Rotation	PCDF	Year 1 of six year rotation – green manure year	-

Soybean	Agriculture and Agri-Food Canada	Assessment of soy protein by variety	48
Spring Wheat	Manitoba Agriculture	Assessment of the current Fusarium Head Blight Risk Model	27
Spring Wheat	Manitoba Agriculture	Determination of optimum seeding rates for wheat	10
Spring Wheat	Manitoba Agriculture	Management practices for high-yielding spring wheat	20
Spring Wheat	Parkland Coop	Variety Trial	30
Details of MCVET trials listed in table below			

Table 2: 2018 MCVET Trials

Crop type	# of plots	Site
Barley	15	Roblin
Oats	21	Roblin
Flax	33	Roblin
Total plots	69	

For MCVET trial results conducted by PCDF, please see *Seed Manitoba Guide* or visit websites *www.seedinteractive.ca* or www.seedmb.ca.

Table 3: 2018 PCDF Exclusive Trials

Crop Type	Collaborators	Purpose
Oats	Crop Development Centre	Variety Trial
Oats	Pepsi Quaker Oats	Variety Trial
Quinoa	Northern Quinoa Production Corp	Variety Trial

Table 4: 2018 PCDF Discontinued Trials

Crop Type	Collaborators	Purpose	Number of Entries
Canola	Cibus	Demonstration	1
Corn-Soy Intercrop	PCDF	Demonstration	-
Fababean	MCVET	Variety Trial	30
Fall Rye	MCVET	Variety Trial	8
Green Manure	PCDF	Demonstration	-
Winter Wheat	MCVET	Variety Trial	7
Winter Wheat	Ducks Unlimited	Agronomy Trial	8

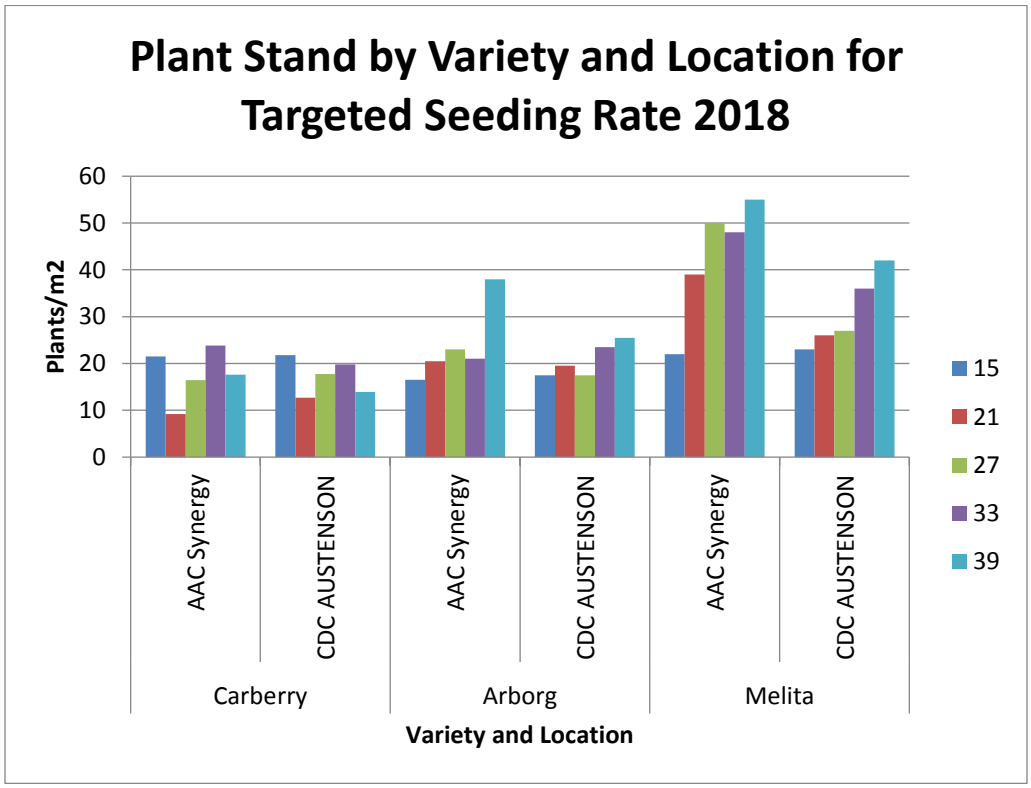
Manitoba Agriculture Barley Seeding Rate

Project duration: May 2017 – August 2018
Objectives: To determine if optimum seeding rates differ by crop type and for individual varieties and to assist producers with the annual question of what target plant stands and seeding rates to aim for regarding newer spring cereal varieties. This project was conducted at four Manitoba Agriculture diversification centres in Manitoba including at Carberry, Arborg, Roblin and Melita.

Collaborators: Anastasia Kubinec – Manager, Crop Industry Development, Manitoba Agriculture
Anne Kirk – Crop Industry Development, Manitoba Agriculture
Rejean Picard and Earl Bargen – Farm Production Extension

Results
The cumulative results of the two years for this project will be available at a later date. PCDF will post the link when it becomes available. This report concerns only the structure of the trial for 2018.

Figure 1: Diversification Centres comparative oats plant stand by variety and by seeding rate in 2018



Note: Roblin data excluded from plant stand due to error in plant counting

Figure 2: Yield demonstrated for variety AAC Synergy by seeding rate in 2018

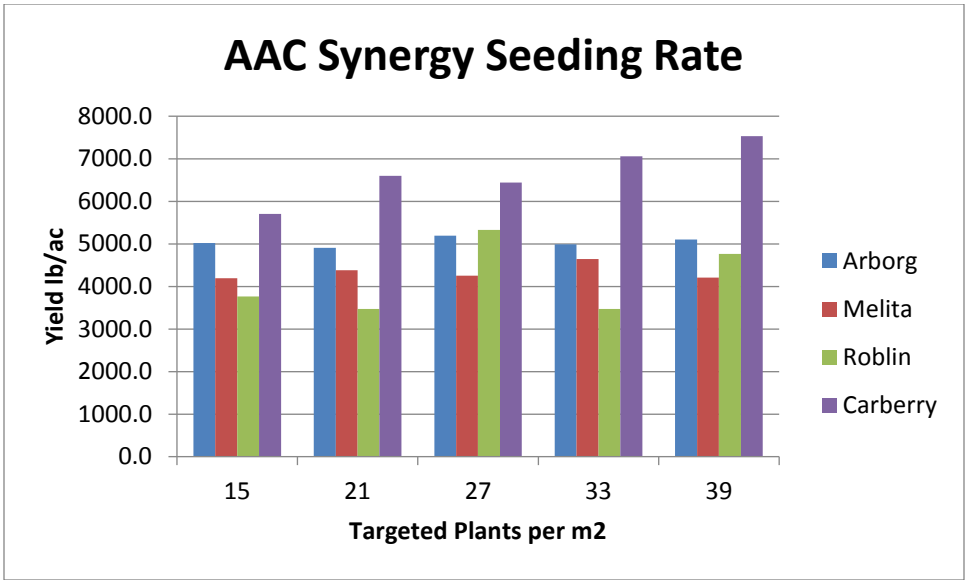
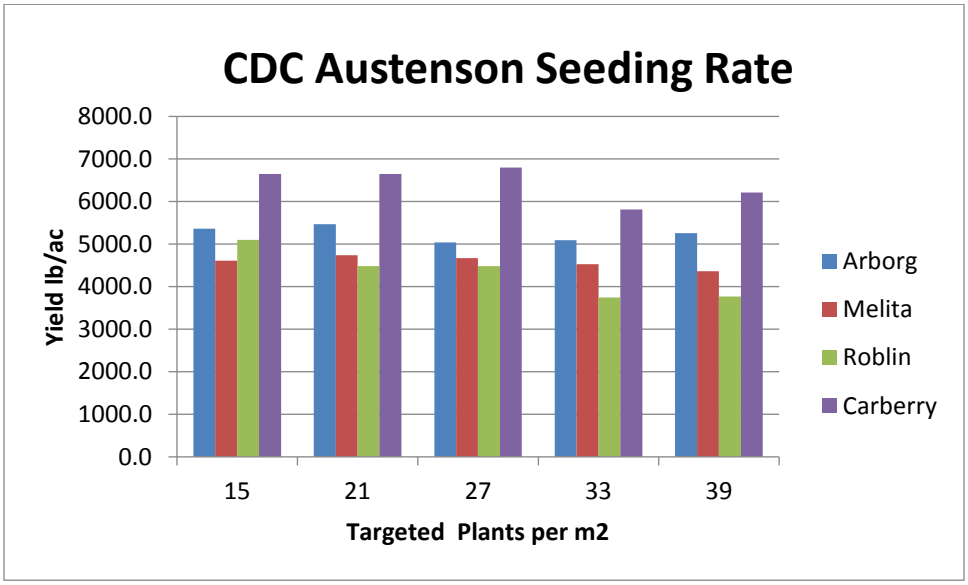


Figure 3: Yield demonstrated for variety CDC Austenson by Seeding Rate in 2018



Background

This project was developed and implemented by Manitoba Agriculture.

Roblin Materials & Methods

Experimental Design:	Random Complete Block Design
Entries:	5 seeding rates x 2 varieties
Seeding:	May 15
Harvest:	Aug 24

Table 1: Target Plant Populations

(Plants/m^2)	15	21	27	33	39

Roblin Data collected and date collected

Emergence:	May 22
Emergence population:	June 9
% Seed mortality:	June 9
Heading (50%):	July 5
Head counts:	July 11
Lodging:	Aug 24
Yield and Moisture	Aug 24

Roblin Agronomic info

Previous year's crop:	Oat barley silage
Soil Type:	Erickson Loam Clay
Landscape:	Rolling with trees to the east
Seedbed preparation:	Heavy harrowed twice

Table 2: Roblin Spring 2018 Soil Test

	Available
N	54 lb/ac
P	13 ppm
K	228 ppm
S	118 lb/ac

Table 3: Roblin Added N and P

Blend	Blend (actual lbs/ac)	Actual lbs N	Actual lbs P
46-0-0	169.31	80	0
11-52-0-0	19.23	2.12	10
Total	-	82.12	10

N side-banded; P Banded with seed

Table 4: Roblin Pesticide Application

Crop stage	Date	Product	Rate
Pre-emerge	May 19	RoundUp	0.67 L/ac
		Heat	28.4g/ac
In-crop	July 13	Prestige XC	0.13 L/ac
		Axial	0.48L/ac
Desiccation	Aug 17	RoundUp	0.94 L/ac

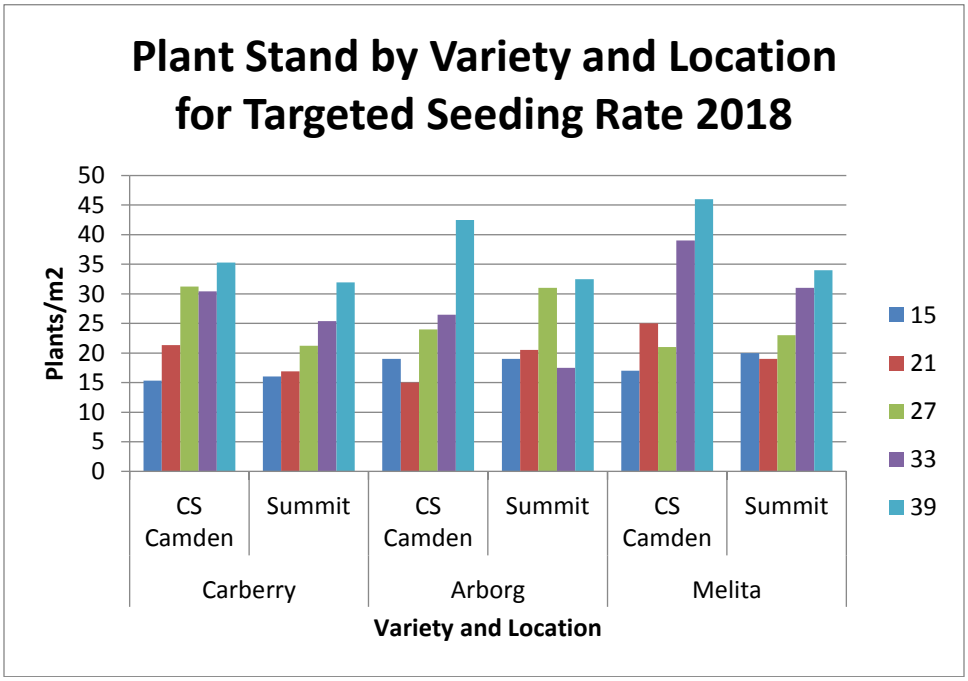
Manitoba Agriculture Oat Seeding Rate

Project duration: May 2017 – August 2018
Objectives: To determine if optimum seeding rates differ by crop type and for individual varieties and to assist producers with the annual question of what target plant stands and seeding rates to aim for regarding newer spring cereal varieties. This project was conducted at four Manitoba Agriculture diversification centres in Manitoba including at Carberry, Arborg, Roblin and Melita.

Collaborators: Anastasia Kubinec – Manager, Crop Industry Development, Manitoba Agriculture
Anne Kirk – Crop Industry Development, Manitoba Agriculture
Rejean Picard and Earl Bargen – Farm Production Extension

Results
The cumulative results of the two years for this project will be available at a later date. PCDF will post the link when it becomes available. This report concerns only the structure of the trial for 2018, but results are illustrated across the four Diversification Centres in Roblin, Carberry, Melita and Arborg.

Figure 1: Diversification Centres comparative oats plant stand by variety and by seeding rate in 2018



Note: Roblin data excluded from plant stand due to error in plant counting

Figure 2: Yield demonstrated for variety CS Camden by seeding rate in 2018

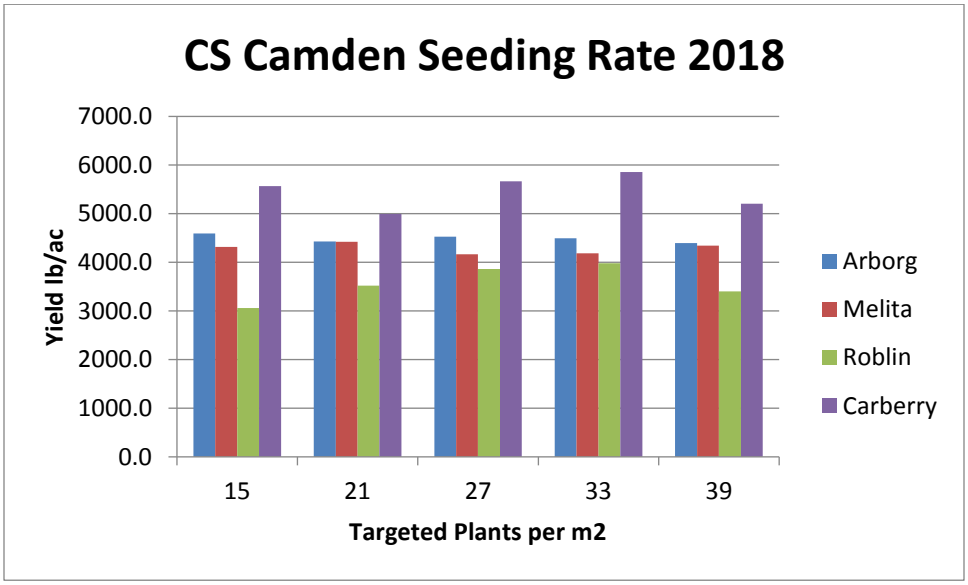
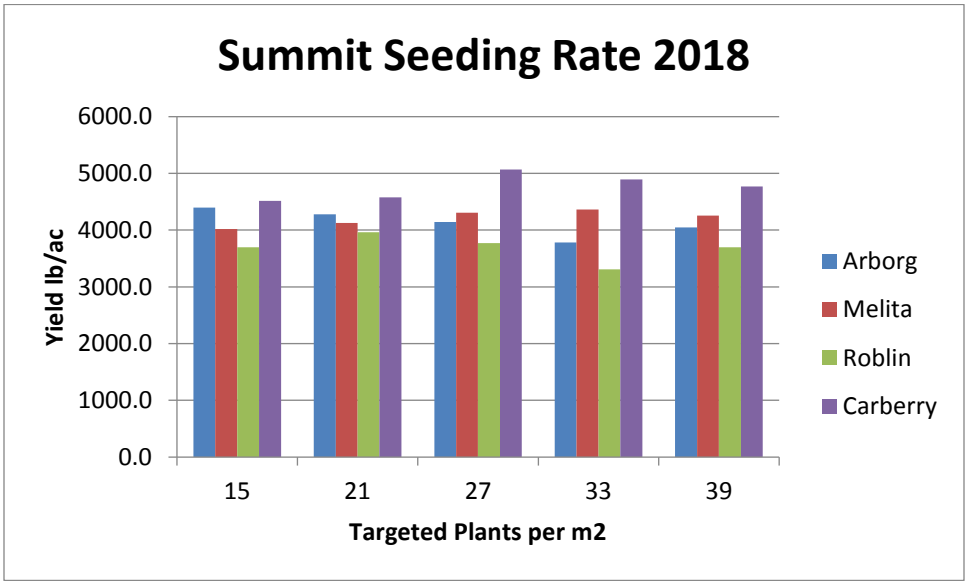


Figure 3: Yield demonstrated for variety Summit by Seeding Rate in 2018



Background
This project was developed and implemented by Manitoba Agriculture.

Experimental Design:	Random Complete Block Design
Entries:	10 entries for each cereal
Seeding:	May 15

Harvest: Aug 24

Table 1: Target Plant Populations

(Plants/m^2)	15	21	27	33	39

Roblin Data collected and date collected

Emergence: May 22
Emergence population: June 9
% Seed mortality: June 9
Heading (50%): July 5
Head counts: July 11
Lodging: Aug 24
Yield: Aug 24
Moisture: Aug 24

Roblin Agronomic info

Previous year's crop: Oat barley silage
Soil Type: Erickson Loam Clay
Landscape: Rolling with trees to the east
Seedbed preparation: Heavy harrowed twice

Table 2: Roblin Spring 2018 Soil Test

	Available
N	54 lb/ac
P	13 ppm
K	228 ppm
S	118 lb/ac

Table 3: Roblin Added N and P

Blend	Blend (actual lbs/ac)	Actual lbs N	Actual lbs P
46-0-0	95.4	46	0
11-52-0-0	19.23	2.12	10
Total	-	48.12	10

N side-banded; P Banded with seed

Table 4: Roblin Pesticide Application

Crop stage	Date	Product	Rate
Pre-emerge	May 19	RoundUp	0.67 L/ac
		Heat	28.4g/ac
In-crop	July 13	Prestige XC	0.13 L/ac
Desiccation	Aug 17	RoundUp	0.94 L/ac

Manitoba Agriculture Wheat Seeding Rate

Project duration: May 2017 – August 2018
Objectives: To determine if optimum seeding rates differ by crop type and for individual varieties and to assist producers with the annual question of what target plant stands and seeding rates to aim for regarding newer spring cereal varieties. This project was conducted at four Manitoba Agriculture diversification centres in Manitoba including at Carberry, Arborg, Roblin and Melita.

Collaborators: Anastasia Kubinec – Manager, Crop Industry Development, Manitoba Agriculture
Anne Kirk – Crop Industry Development, Manitoba Agriculture
Rejean Picard and Earl Bargen – Farm Production Extension

Results
The cumulative results of the two years for this project will be available at a later date. PCDF will post the link when it becomes available. This report concerns only the structure of the trial for 2018.

Figure 1: Diversification Centres comparative barley plant stand by variety and by seeding rate in 2018

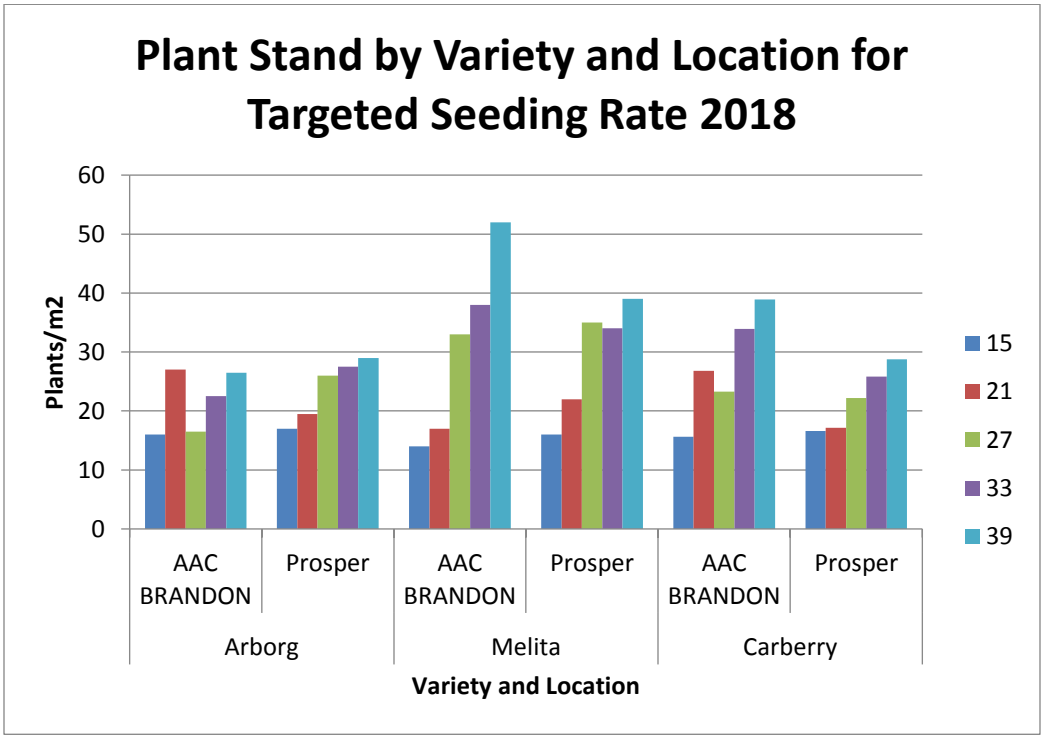


Figure 2: Yield demonstrated for variety AAC Brandon by seeding rate in 2018

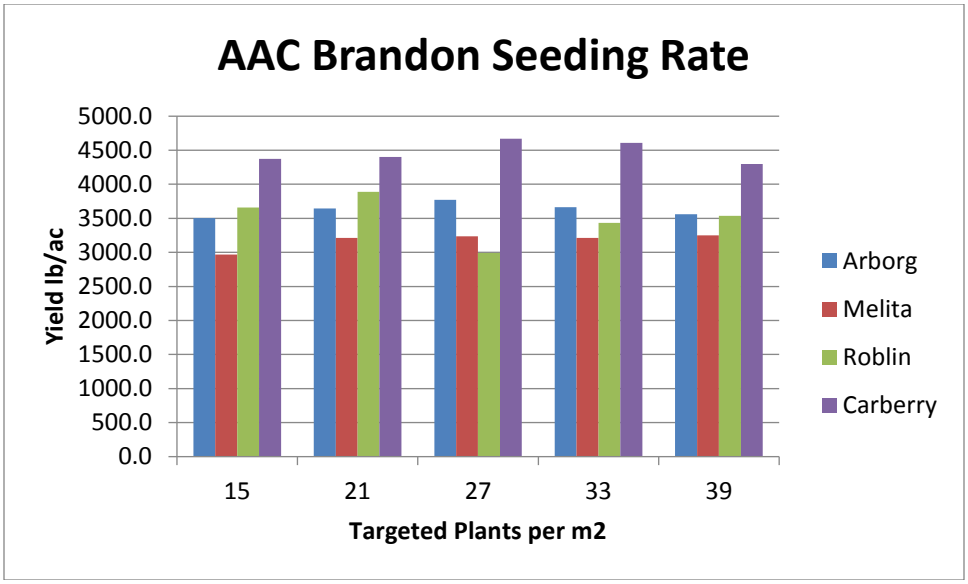
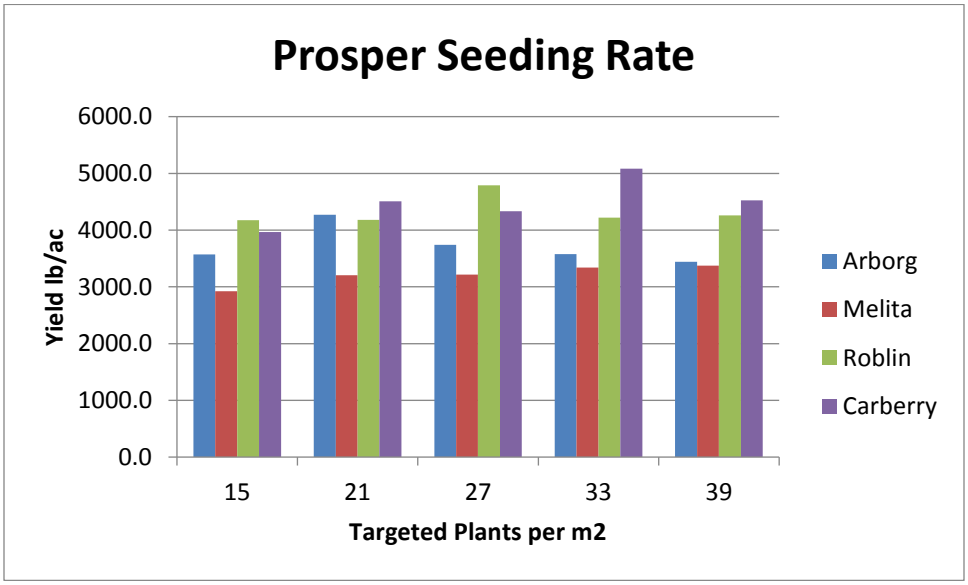


Figure 3: Yield demonstrated for variety Prosper by seeding rate in 2018



Background
This project was developed and implemented by Manitoba Agriculture.

Roblin Materials & Methods

Experimental Design:	Random Complete Block Design
Entries:	2 varieties x 5 seeding rates
Seeding:	May 15
Harvest:	Aug 23

Table 1: Target Plant Populations

(Plants/m^2)	15	21	27	33	39

Roblin Data collected and date collected

Emergence:	May 25
Emergence population:	June 9
% Seed mortality:	June 9
Heading (50%):	July 2
Head counts:	July 11
Lodging:	Aug 23
Yield and Moisture:	Aug 23

Roblin Agronomic info

Previous year's crop:	Oat barley silage
Soil Type:	Erickson Loam Clay
Landscape:	Rolling with trees to the east
Seedbed preparation:	Heavy harrowed twice

Table 2: Spring 2018 Soil Test

	Available
N	54 lb/ac
P	13 ppm
K	228 ppm
S	118 lb/ac

Table 3: Added N and P

Blend	Blend (actual lbs/ac)	Actual lbs N	Actual lbs P
46-0-0	204.1	96	0
11-52-0-0	19.23	2.12	10
Total	-	98.12	10

N side-banded; P Banded with seed

Table 4: Pesticide Application

Crop stage	Date	Product	Rate
Pre-emerge	May 19	RoundUp	0.67 L/ac
		Heat	28.4g/ac
In-crop	July 13	Prestige	0.26 L/ac
		Axial	0.48L/ac
Desiccation	Aug 17	RoundUp	0.94 L/ac

Manitoba Agriculture Wheat Fusarium Head Blight Risk Model

Project duration	May 2018 – August 2018
Objectives	To increase understanding of resulting Fusarium Head Blight (FHB) infection for wheat and barley based on the current model.
Collaborators	Holly Derksen – Field Pathologist, Crop Industry Development Anne Kirk – Cereal Specialist, Crop Industry Development Rejean Picard and Earl Bargen – Farm Production Extension

Results

Grain samples were sent away for Fusarium specific analysis, but no report for these results has yet been generated. PCDF will post a link when this report is available. Other collected data and yield results for the four diversifications centres in Roblin, Carberry, Arborg and Melita are included below.

Figure 1: Yield by Location and Timing of Fungicide Application for AAC Brandon

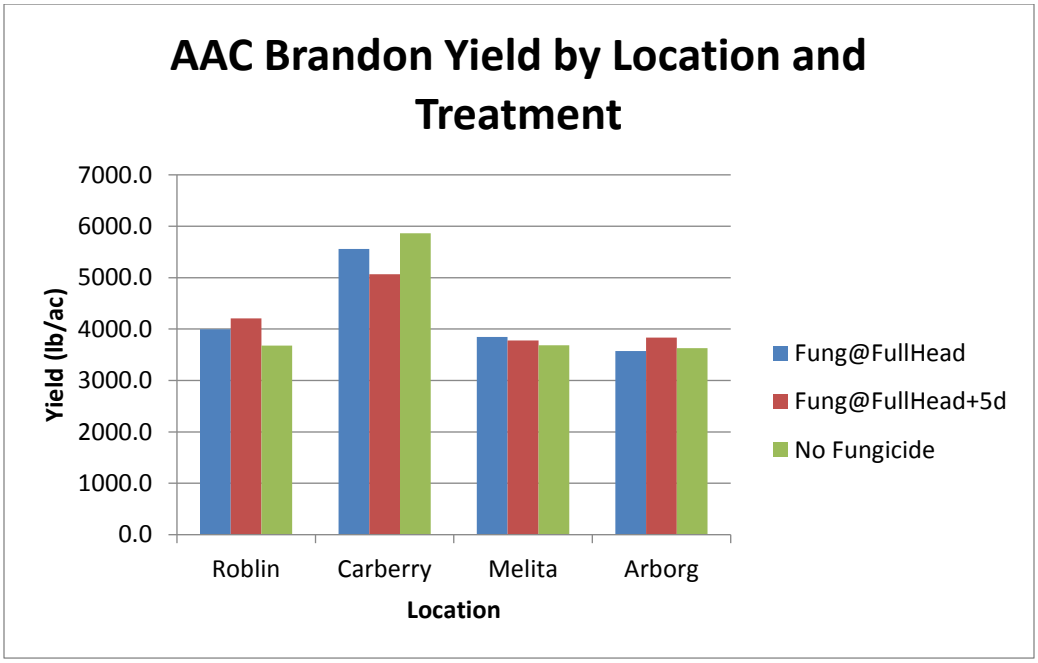


Figure 2: Yield by Location and Timing of Fungicide Application for AAC Tenacious

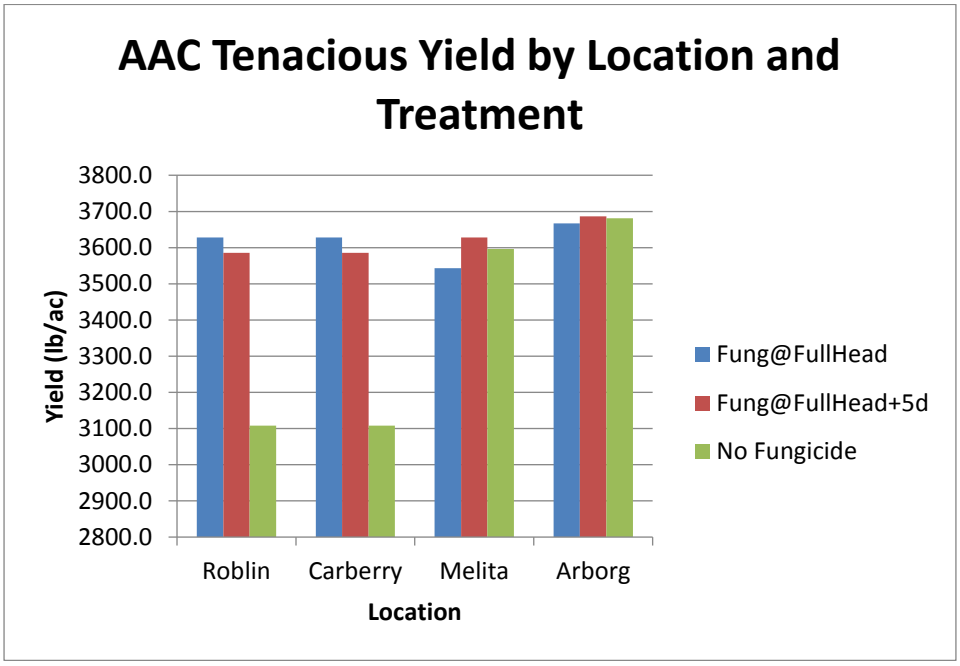
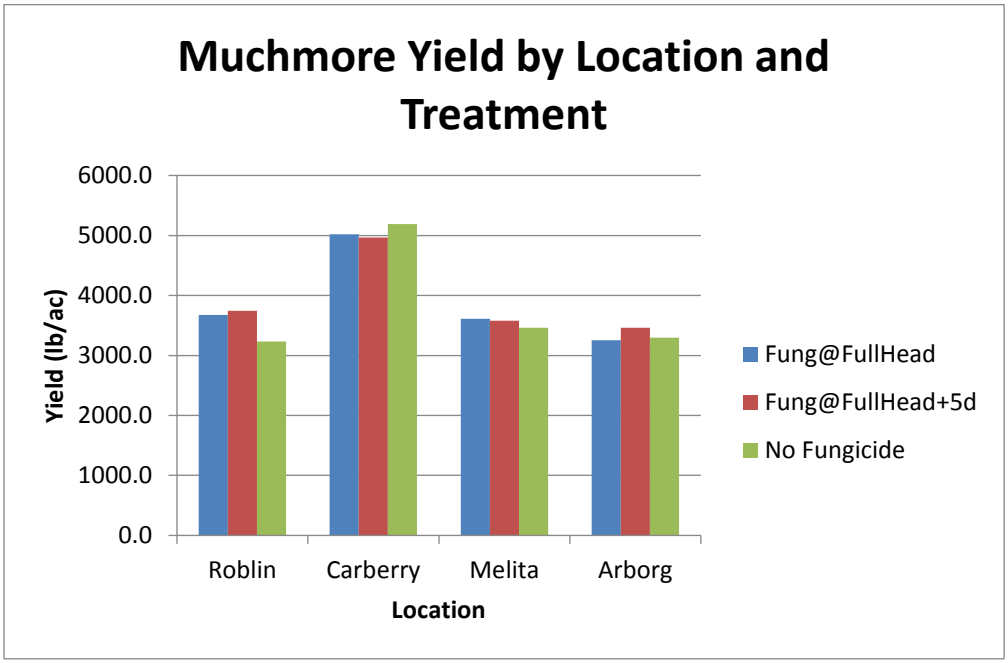


Figure 3: Yield by Location and Timing of Fungicide Application for Muchmore



Background

Farmers need improved decision-making tools in order to assess the local risk of Fusarium Head Blight (FHB). Better tools would improve judgement on whether or not to use fungicide and how to time

application. The project recognizes that the current model for predicting the presence of FHB is insufficient and is gathering data across the province for different treatment plans using known fusarium resistant or fusarium susceptible varieties.

Materials & Methods

Experimental Design	Random Complete Block Design
Entries	9 for both wheat and barley (3 varieties x 3 treatments)
Seeding	May 15
Harvest	Aug 23
Varieties	AAC Tenacious
	AAC Brandon
	Muchmore
Target population	30 plants/ft2 assuming 15% seedling mortality
Treatments	No fungicide
	Fungicide at full head emergence/early anthesis
	Fungicide five days after full head emergence/early anthesis

Data collected	**Date collected**
Emergence	Jun 30 to Jul 7
Heading	Jun 30 to Jul 7
Flowering	Jul 9 - 20
Rust rating	-
Fungal rating	-
FHB rating	Aug 3
Heights	Aug 2
Yield	Aug 17
Moisture	Aug 17

Samples sent away to analyze for fusarium damaged kernels and kernel accumulation of DON

Agronomic info

Previous 2 years crop	Oat barley silage
Soil Type	Erickson Loam Clay
Landscape	Rolling with trees to the east
Seedbed preparation	No-till due to moisture concerns; direct-seeded into stubble

Table 1: Spring 2018 Soil Test

	Available	Needed for Wheat
N	54 lb/ac	96 lb/ac
P	13 ppm	10 lb/ac
K	228 ppm	0 lb/ac
S	118 lb/ac	0 lb/ac

Table 2: Wheat Added N and P

Blend	Blend (actual lbs/ac)	Actual lbs N	Actual lbs P
46-0-0	204.1	96	0
11-52-0-0	19.23	2.12	10
Total	-	98.12	10

N banded with seed; P side-banded

Table 3: Pesticide Application for Wheat

Crop stage	Date	Product	Rate
Pre-emerge	May 19	Heat	28.4g/ac
		Round-up	0.67L/ac
In-crop	Jul 13	Prestige XC	0.13 L/ac
Desiccation	Aug 17	RoundUp	0.94 L/ac

Priaxor applied July 13 and July 17 as a fungicide according to predetermined treatments described above at the rate of 0.06 L/ac

Manitoba Agriculture Barley Fusarium Head Blight Risk Model

Project duration	May 2018 – August 2018
Objectives	To increase understanding of resulting Fusarium Head Blight (FHB) infection for wheat and barley based on the current model.
Collaborators	Holly Derksen – Field Pathologist, Crop Industry Development Anne Kirk – Cereal Specialist, Crop Industry Development Rejean Picard and Earl Bargen – Farm Production Extension

Results

Grain samples were sent away for Fusarium specific analysis, but no report for these results has yet been generated. PCDF will post a link when this report is available. Other collected data and yield results for the Roblin site are included below.

Figure 1: Yield by Location and Timing of Fungicide Application for AAC Synergy

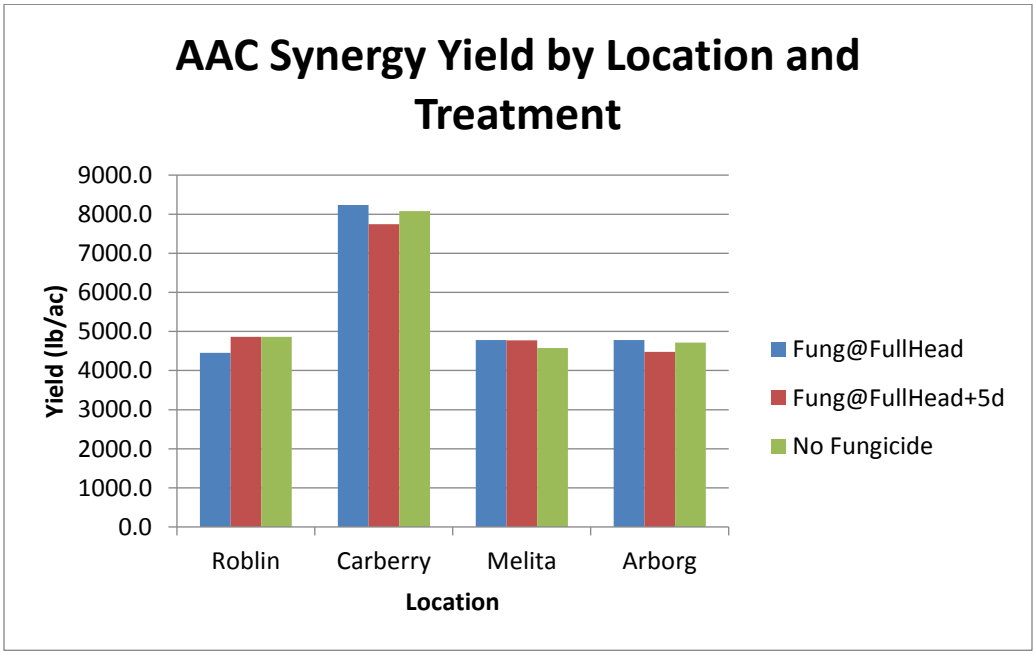


Figure 2: Yield by Location and Timing of Fungicide Application for CDC Austenson

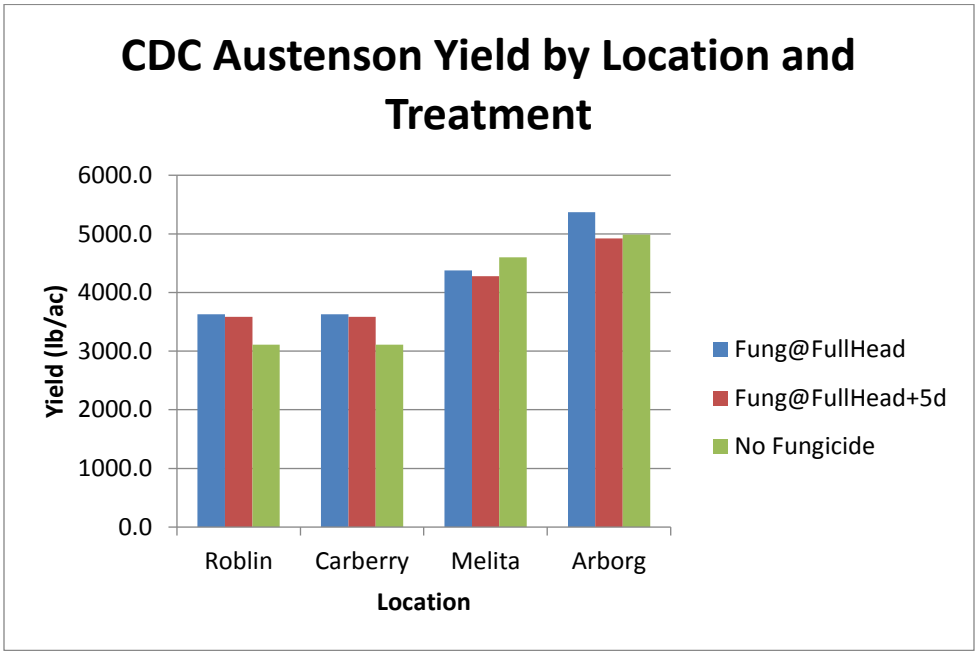
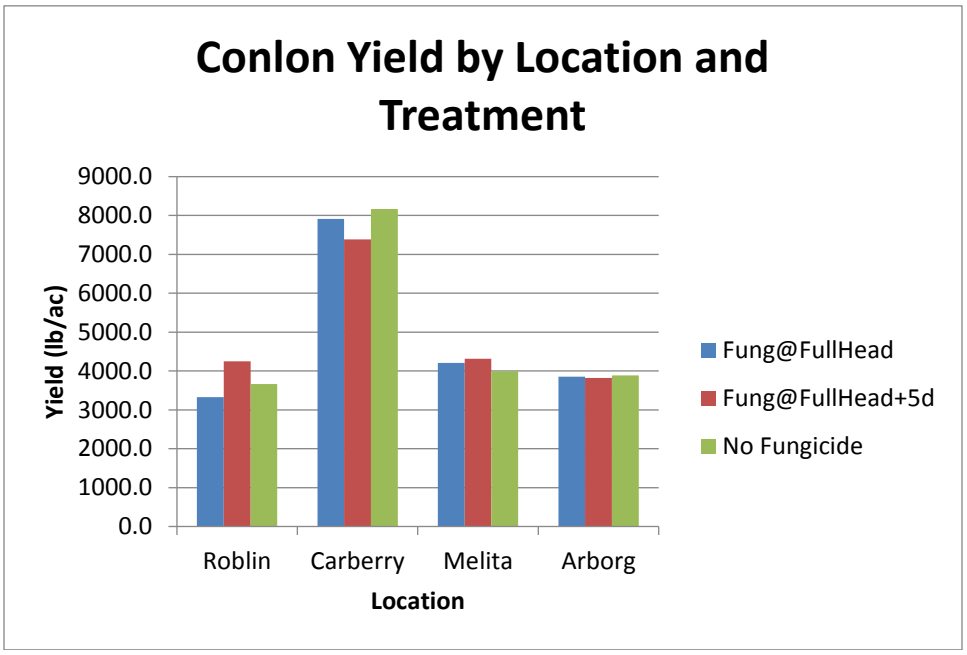


Figure 3: Yield by Location and Timing of Fungicide Application for Conlon



Background

Farmers need improved decision-making tools in order to assess the local risk of Fusarium Head Blight (FHB). Better tools would improve judgement on whether or not to use fungicide and how to time

application. The project recognizes that the current model for predicting the presence of FHB is insufficient and is gathering data across the province for different treatment plans using known fusarium resistant or fusarium susceptible varieties.

Materials & Methods

Experimental Design	Random Complete Block Design
Entries	9 for both wheat and barley (3 varieties x 3 treatments)
	Barley
Seeding	May 16
Harvest	Aug 23
Varieties	CDC Austenson
	Conlon
	AAC Synergy
Target population	30 plants/ft2 assuming 15% seedling mortality
Treatments	No fungicide
	Fungicide at full head emergence/early anthesis
	Fungicide five days after full head emergence/early anthesis

Data collected	**Date collected**
Emergence	-
Heading	Jul 5 - 11
Flowering	Jul 22 to Aug 3
Rust rating	Jul 31
Fungal rating	Jun 20
FHB rating	Aug 3
Heights	Aug 2
Yield	Aug 2
Moisture	Aug 17

Samples sent away to analyze for fusarium damaged kernels and kernel accumulation of DON

Agronomic info

Previous 2 years crop	Oat barley silage
Soil Type	Erickson Loam Clay
Landscape	Rolling with trees to the east
Seedbed preparation	No-till due to moisture concerns; direct-seeded into stubble

Table 1: Spring 2018 Soil Test

	Available	Needed for Barley
N	54 lb/ac	80 lb/ac
P	13 ppm	10 lb/ac
K	228 ppm	
S	118 lb/ac	

Table 2: Barley Added N and P

Blend	Blend (actual lbs/ac)	Actual lbs N	Actual lbs P
46-0-0	169.31	80	0
11-52-0-0	19.23	2.12	10
Total	-	82.12	10

N banded with seed; P side-banded

Table 3: Pesticide Application for Barley

Crop stage	Date	Product	Rate
Pre-emerge	May 18	Heat	28.4g/ac
		Round-up	0.67L/ac
In-crop	Jul 13	Prestige XC	0.13 L/ac
		Axial	0.48 L/ac
Desiccation	Aug 17	RoundUp	0.94 L/ac

Priaxor applied July 13 and July 17 as a fungicide according to predetermined treatments described above at the rate of 0.06 L/ac

Management Practices for High Yielding Spring Wheat

Project duration May 2018 – August 2018

Objectives The objective of project is to quantify the yield benefit of intensive management practices in spring wheat, and to determine if these management practices provide the same benefit to a variety of cultivars.

Collaborators Anastasia Kubinec – Manager, Crop Industry Development, Manitoba Agriculture
Anne Kirk and Rejean Picard – Crop Industry Development, Manitoba Agriculture

Results

The result on the protein analysis will be available at a later date. PCDF will post the link when it becomes available. For yield results by treatment please see Figure 1 – Figure 5. For treatment outline please see Table 1.

Figure 1: Yield results by location and variety for Treatment 1

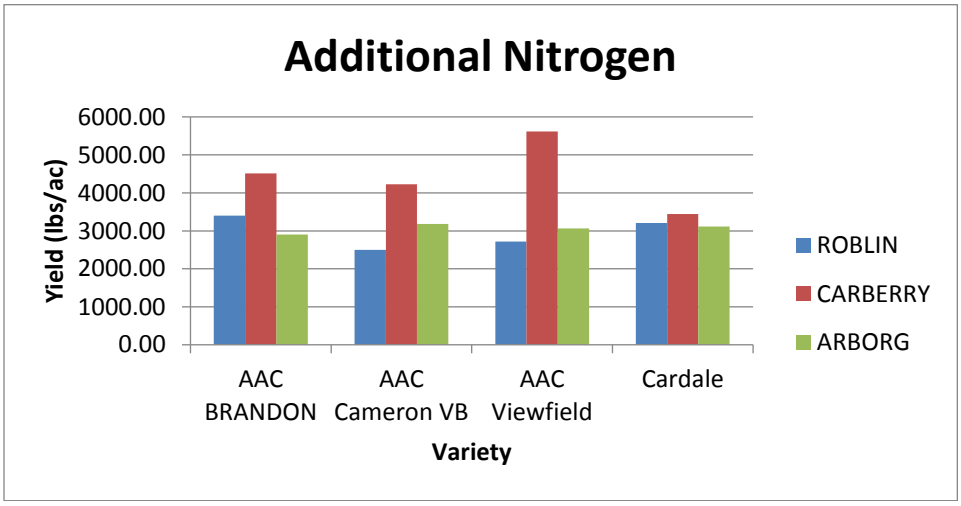


Figure 2: Yield results by location and variety for Treatment 2

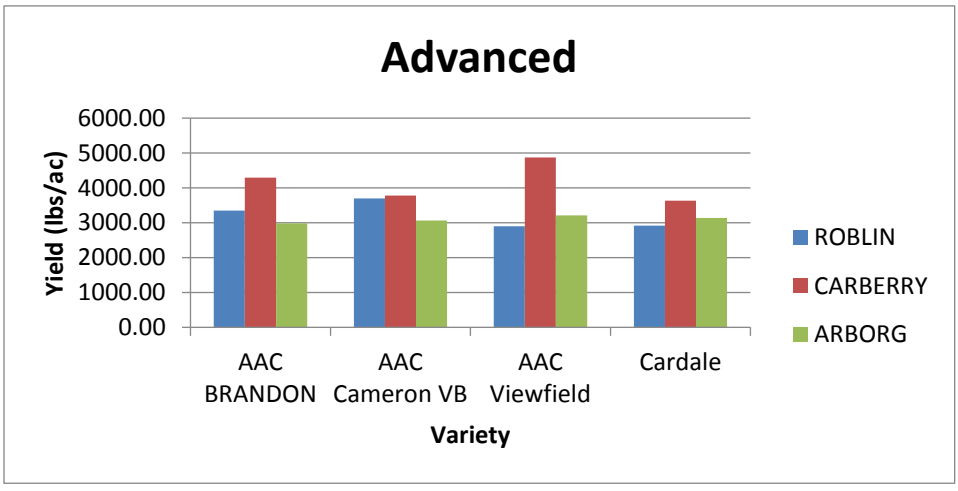


Figure 3: Yield results by location and variety for Treatment 3

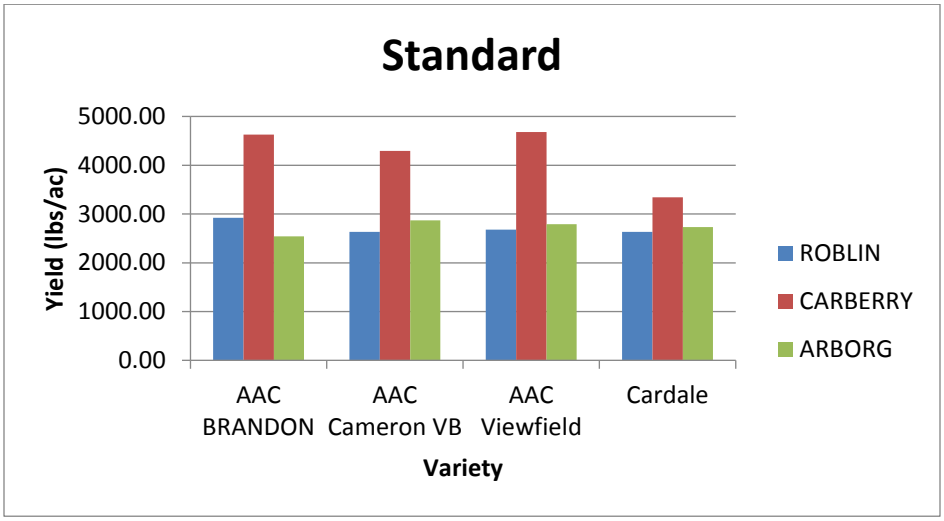


Figure 4: Yield results by location and variety for Treatment 4

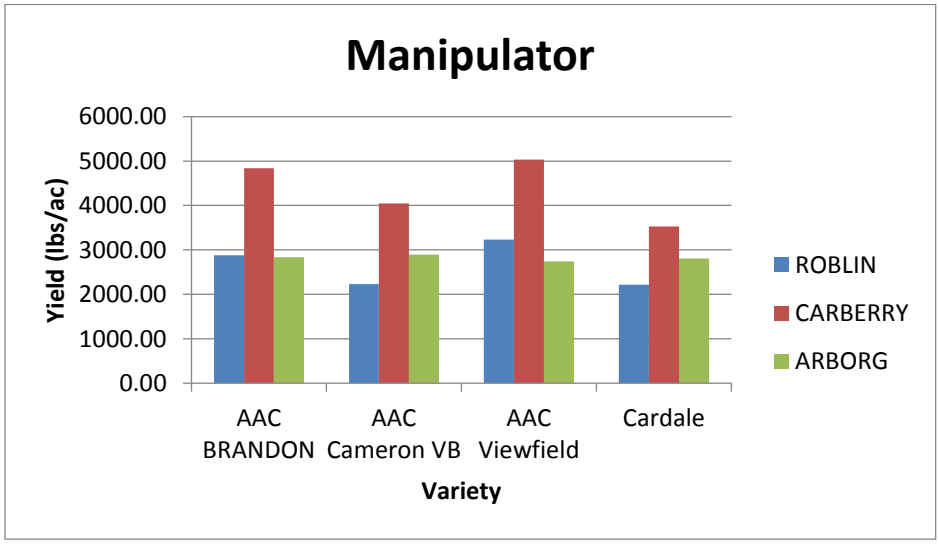
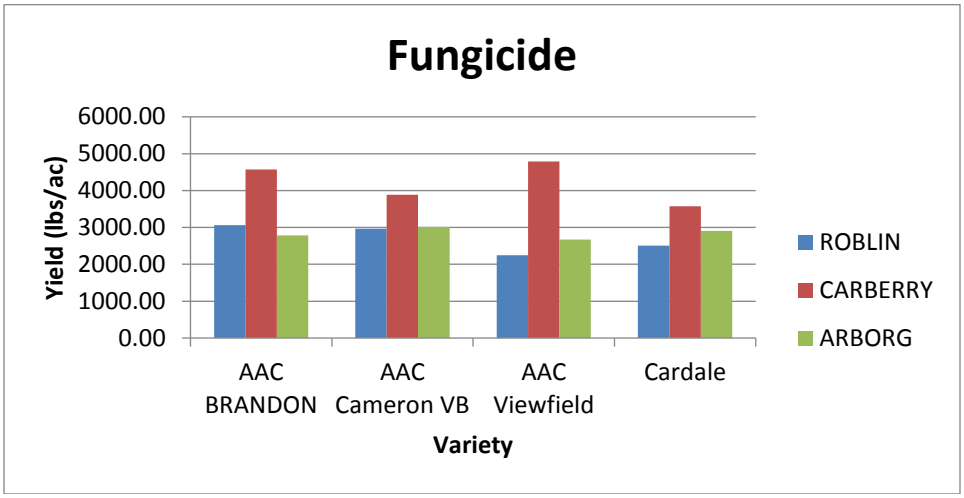


Figure 5: Yield results by location and variety for Treatment 1



Background

The focus of this project is on plant growth regulators (PGRs), fungicides, and higher nitrogen rates.

Targeting higher yields often means increasing nitrogen rates, which brings with it the increased risk of lodging. PGRs are used to improve crop standability, and may be a good fit for a management system with increased nitrogen rates. The PGR "Manipulator" (chlormequat chloride) is registered for use in Canada, but uptake has been limited due to the previous absence of an established maximum residue limit (MRL) for the USA. This limit was set in April of 2018, marking a change in the management practices that are open to Manitoban wheat growers.

Fungicides to control fusarium head blight (FHB) and leaf diseases are commonly used on spring wheat in Manitoba. Previous research has found some evidence of PGRs reducing protein content in spring wheat, but this is potentially not the case when PGRs are applied with fungicides.

The objective of this project is to quantify the yield benefit of intensive management practices in spring wheat, and to determine if these management practices provide the same benefit to a variety of cultivars. This information will help producers make decisions on where to focus their input dollars, and will provide an opportunity to highlight the effects of PGR's in spring wheat production.

Roblin Materials & Methods

Experimental Design	Random Complete Block Design
Entries	20 – 4 varieties x 5 treatments *(see Table 1)*
Varieties	AAC Brandon; AAC Viewfield; Cardale; AAC Cameron VB
Seeding	May 15
Harvest	Aug 23

Table 1: Treatments for Management of High Intensity Spring Wheat

Treatment	N application	Fungicide *(Acapella)*	PGR *(Manipulator)*
1	100 lbs/ac	None	None

2	150 lbs/ac	None	None
3	100 lbs/ac	None	Applied at flag leaf
4	100 lbs/ac	At flag leaf and anthesis	None
5	150 lbs/ac	At flag leaf and anthesis	Applied

N banded with seed according to treatments set out in Table 1; P side-banded to 10lb/ac

As demonstrated in Table 1, the treatments involved different combinations of fertilizer rates, with or without fungicide and with or without a PGR.

- Treatment 1 represented a very standard treatment with regards to fertility and no fungicide or PGR.
- Treatments 3 and 4 used the same baseline fertility, however Treatment 3 incorporated PGR (no fungicide) and Treatment 4 incorporated Fungicide (no PGR).
- Treatments 2 and 5 increased the fertility by 50%. Treatment 2 did not incorporate any PGR or Fungicide. Treatment 5, called "Advanced" incorporated all elements of the trial, using increased fertility, and applying both PGR and Fungicide.

(Roblin Specific)

Data collected	**Date collected**
Heading	Jun 30 to Jul 8
Maturity	Aug 17
Disease rating	Jul 31
Height	Aug 2
Lodging	Aug 23
Yield	Aug 23
Moisture	Aug 23
Protein analysis	Sept

Roblin Agronomic info

Previous 2 years crop	Oat barley silage
Soil Type	Erickson Loam Clay
Landscape	Rolling with trees to the east
Seedbed preparation	No-till due to moisture concerns; direct-seeded into stubble

Table 2: Roblin Spring 2018 Soil Test

	Available	Needed
N	54 lb/ac	96 lb/ac
P	13 ppm	10 lb/ac
K	228 ppm	0 lb/ac
S	118 lb/ac	0 lb/ac

Table 3: Roblin 2018 Pesticide Application

Crop stage	Date	Product	Rate
Pre-emerge	May 19	Heat	28.4g/ac
		Round-up	0.67L/ac

In-crop	Jul 16	Prestige XC	0.13 L/ac
		Axial	0.48 L/ac
Desiccation	Aug 17	RoundUp	0.94 L/ac

Table 2: Spring 2018 Soil Test

	Available	Needed
N	54 lb/ac	96 lb/ac
P	13 ppm	10 lb/ac
K	228 ppm	0 lb/ac
S	118 lb/ac	0 lb/ac

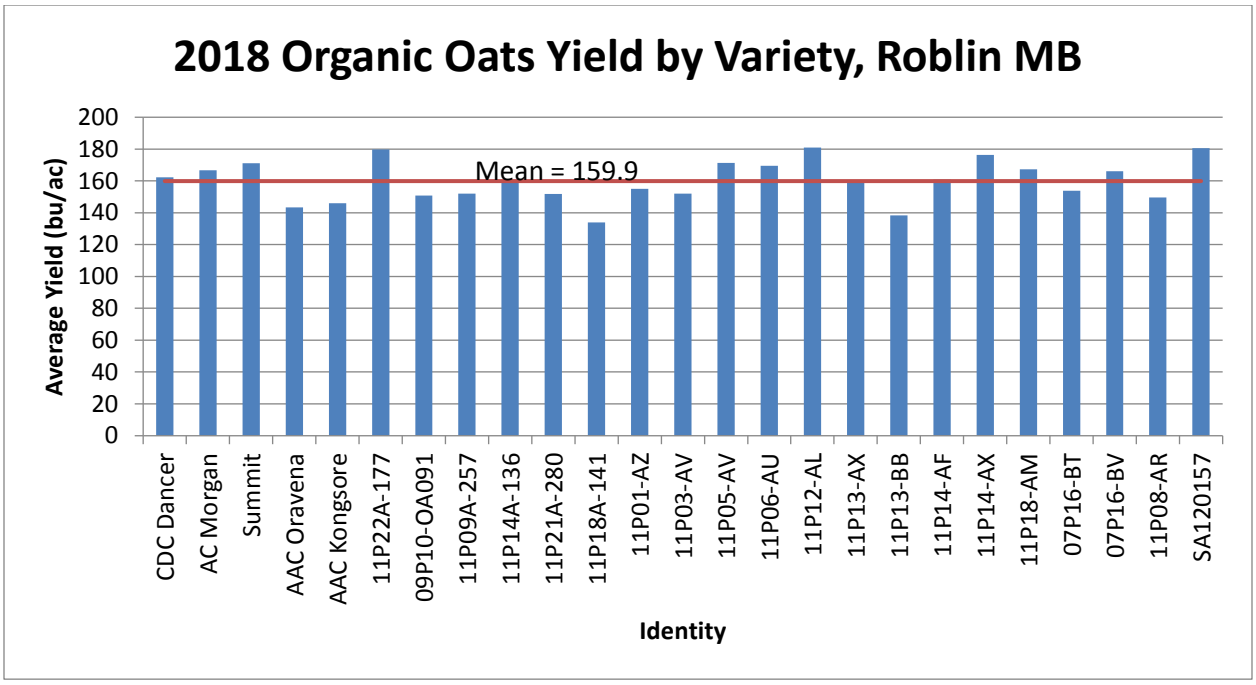
Table 3: Pesticide Application

Crop stage	Date	Product	Rate
Pre-emerge	May 19	Heat	28.4g/ac
		Round-up	0.67L/ac
In-crop	Jul 16	Prestige XC	0.13 L/ac
		Axial	0.48 L/ac
Desiccation	Aug 17	RoundUp	0.94 L/ac

Organic Oats Variety Evaluation

Project duration May 2018 – October 2018
Objective To evaluate oat varieties for organic production.
Collaborators Jennifer Mitchell-Fetch, AAFC Brandon

Results
Figure 1: 2018 Average organic oats yield by variety



Background
Research suggests that selection of cereal crops specific to organic agriculture should be conducted on organically managed land [1,2]. Conventional management systems may mask or confound certain plant characteristics, resulting in selection of sub-optimal cultivars for organic production systems. Organic management conditions were used for the trial at PCDF, although the site is not certified organic.

Materials & Methods

Experimental Design	Random Complete Block Design
Entries	25 varieties
Seeding	May 15
Harvest	Sept 8

Table 1: Varieties included at Roblin 2018

11P05-AV	11P14-AF	11P21A-280	11P06-AU	11P14-AX
11P12-AL	Summit	AC Morgan	AAC Oravena	11P09A-257
CDC Dancer	11P03-AV	11P18A-141	SA120157	11P13-AX
11P01-AZ	07P16-BT	11P14A-136	09P10-OA091	AAC Kongsore
11P08-AR	07P16-BV	11P13-BB	11P22A-177	11P18-AM

Data collected	**Date collected**
Emergence	May 26 - 29
Heading	Jul 7-10
Maturity	Aug 19-25
Height	Aug 2
Yield	Sept 8
Moisture	Sept 8

Agronomic info

Previous 2 years crop	Oat barley silage
Soil Type	Erickson Loam Clay
Landscape	Rolling with trees to the east
Seedbed preparation	Tillage day of seeding

Table 2: Spring 2018 Soil Test

	Available
N	54 lb/ac
P	13 ppm
K	228 ppm
S	118 lb/ac

References

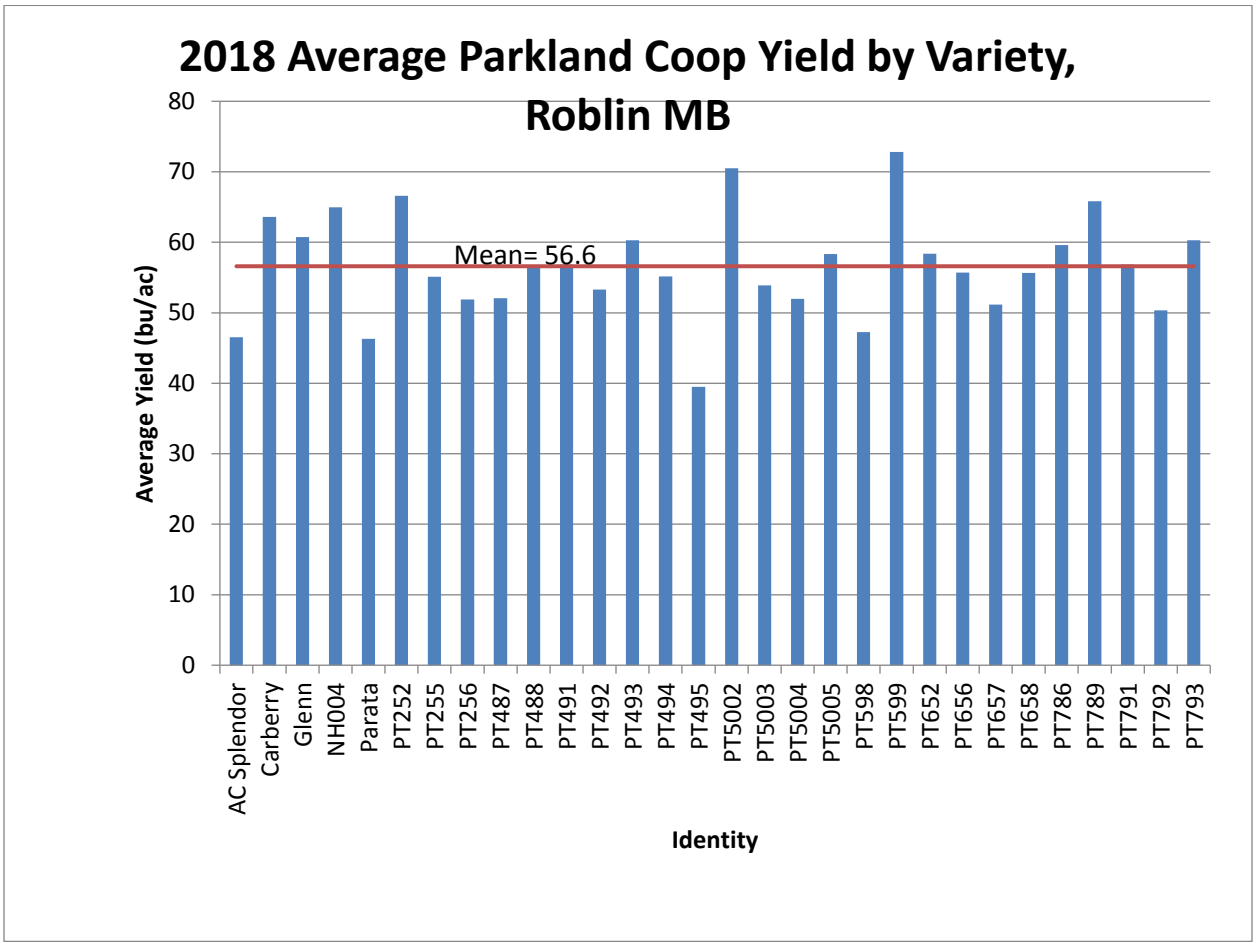
[1] Reid, T., Yang, R.-C., Salmon, D. and Spaner, D. (2009). Should spring wheat breeding for organically managed systems be conducted on organically managed land? Euphytica 169:239-252.
[2] Dalhousie University, Organic Agriculture Centre of Canada. The crafting of organic oats. https://www.dal.ca/faculty/agriculture/oacc/en-home/about/about-oacc/documents/newpaper-articles/newsarticles-2012/newsarticles-2012-fetch.html

Parkland Coop Wheat Variety Evaluation

Project duration May 2018 – August 2018
Objectives To evaluate wheat varieties for the Parkland Coop
Collaborators: Dean Spanner – Coordinator, University of Alberta Research Station
Klaus Strenzke – Research Technician, University of Alberta Research Station

Results

Figure1: 2018 Average Parkland wheat yield by variety



Project findings
These data were generated for the Parkland Coop; however, due to intellectual property issues pertaining to Plant Breeders' Rights, results for individual lines are not provided in this report. For more information on the Coop trial, contact Klaus Strenzke, University of Alberta.

Background

The Parkland Cooperative wheat trial is conducted across the Prairies as a resource for wheat breeders to generate data in support of registration of new Canada Western Red Spring varieties. Additional samples taken to test for wheat midge were sent away at the end of July.

Materials & Methods

Experimental Design	Rectangular Lattice
Entries	30 varieties
Seeding	May 15
Harvest	Aug 23
Varieties	See Table 1

Table 1: Varieties included in trial at Roblin, 2018

AC Splendor	PT488	PT492	PT255	PT5004
Carberry	PT598	PT5002	PT256	PT5005
Glenn	PT599	PT656	PT493	PT791
Parata	PT652	PT789	PT494	PT792
PT252	PT786	PT657	PT495	PT793
PT487	PT491	PT658	PT5003	NH004

Data collected	**Date collected**
Emergence date	May 25
Heading	Jun 30 to Jul 6
Maturity	Aug 17
Height	Aug 2
Lodging	Aug 23
Yield	Aug 23
Moisture	Aug 23

Agronomic info

Previous year's crop	Oat barley silage
Soil Type	Erickson Loam Clay
Landscape	Rolling with trees to the east
Seedbed preparation	No-till due to moisture concerns; direct-seeded into stubble

Table 2: Spring 2018 Soil Test

	Available	Needed for Barley	Needed for Wheat
N	54 lb/ac	80 lb/ac	96 lb/ac
P	13 ppm	10 lb/ac	10 lb/ac
K	228 ppm		0 lb/ac
S	118 lb/ac		0 lb/ac

Table 3: Added N and P

Blend	Blend (actual lbs/ac)	Actual lbs N	Actual lbs P
46-0-0	204.1	96	0
11-52-0-0	19.23	2.12	10
Total	-	98.12	10

N banded with seed; P side-banded

Table 4: Pesticide Application

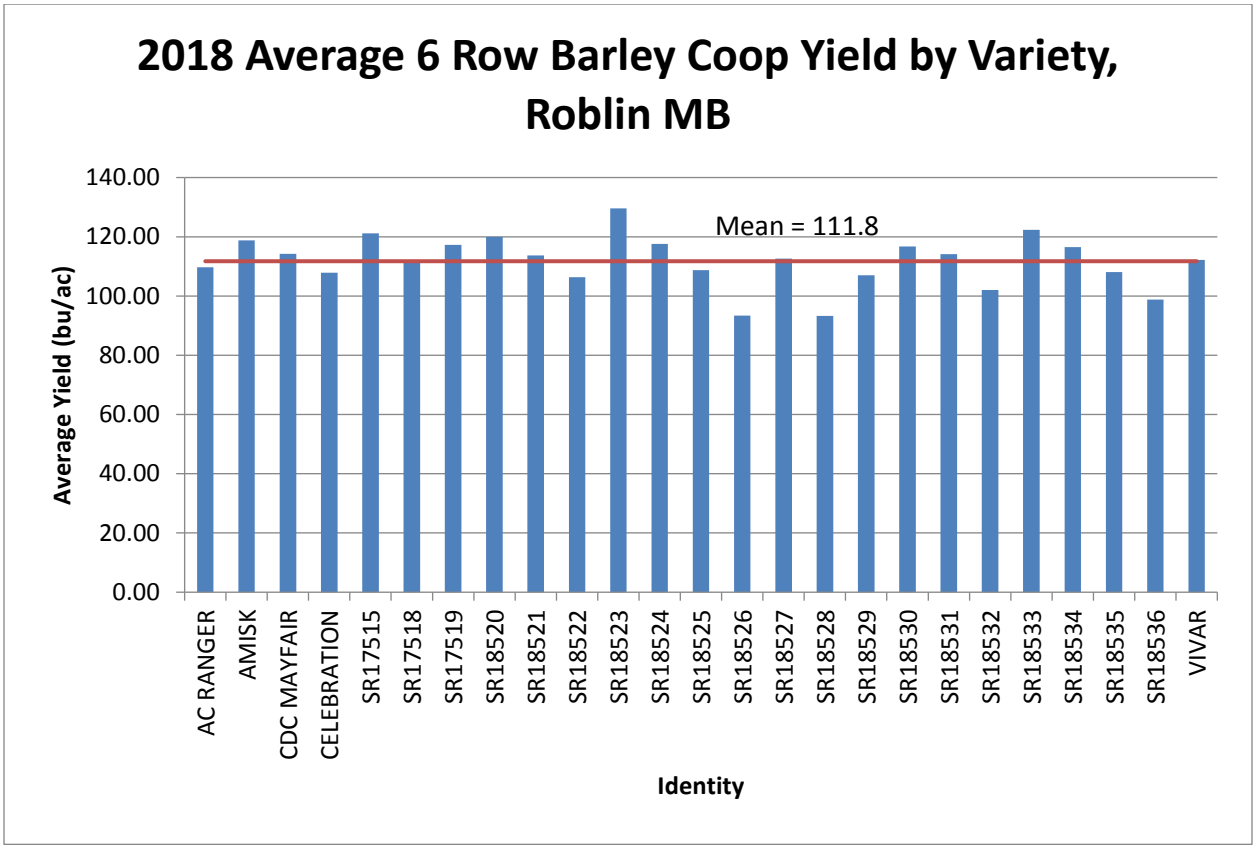
Crop stage	Date	Product	Rate
Pre-emerge	May 19	Heat	28.4g/ac
		Round-up	0.67L/ac
In-crop	July 12	Prestige XCA	0.13 L/ac
		Axial BIA	0.48 L/ac
Desiccation	Aug 17	RoundUp	0.94 L/ac

Western 6-Row Barley Cooperative Variety Evaluation

Project duration May 2018 – August 2018
Objectives To evaluate different lines of six-row barley for malting and feed
Collaborators Dr. Joseph Nyachiro – Barley breeder Alberta Agriculture and Rural Development
Donna Westling – Research Technician Field Crop Development Centre Barley Program

Results

Figure 1: 2018 Average 6 Row Barley Coop yield by variety



Background
AAFC Brandon's barley breeding effort is aimed at developing new varieties of six-row malting barley with improved disease resistance and agronomic performance, combined with enhanced quality traits to expand market opportunities.

Materials & Methods
Experimental Design Random Complete Block Design
Entries 18 entries

Seeding	May 30
Harvest	Aug 24
Varieties	See Table 1

Table 1: Varieties included in trial at Roblin 2018

SR18521	SR18525	SR18528	SR18522
AMISK	SR17518	CDC MAYFAIR	VIVAR
SR18534	SR18532	SR18529	SR18526
SR18527	SR18531	SR18536	SR18524
SR17519	SR17515	SR18535	SR18520
CELEBRATION	SR18530	SR18533	AC RANGER
SR18523			

Data collected	**Date collected**
Heading	Jul 16-18
Flowering	Jul 22-27
Height	Aug 2
Rust Rating	Jul 31
Lodging	Aug 24
Moisture	Aug 29
Yield	Aug 29
% plumps/thins	Sept 10-13

Agronomic info

Previous 2 years crop	Oat barley silage
Soil type	Erickson Loam Clay
Landscape	Rolling with trees to the east
Seedbed preparation	No-till due to moisture concerns; direct-seeded into stubble

Table 2: Spring 2018 Soil Test

	Available
N	54 lb/ac
P	13 ppm
K	228 ppm
S	118 lb/ac

Table 3: Added N and P

Blend	Blend (actual lbs/ac)	Actual lbs N	Actual lbs P
46-0-0	169.31	80	0
11-52-0-0	19.23	2.12	10
Total	-	82.12	10

P banded with seed; N side-banded

Table 4: Pesticide Application

Stage	Date	Product	Rate
Pre-emerge	May 19	RoundUp	0.67 L/ac
		Heat	2.84 g/ac
In-crop	Jun 8	RoundUp	0.67 L/ac
		CurtailM	0.81 L/ac
	Jul 16	PrestigeXC	0.13L/ac
		Axial	0.48L/ac
Desiccation	Aug 17	Roundup	0.94 L/ac

Agriculture Agri Food Canada Corn Variety Evaluation

Project duration May 2018 – November 2018
Objectives To develop and release early maturing cold tolerant corn inbreds with emphasis on the 1800-2000 CHU market.

Collaborators Lana Reid Ph.D – AAFC Research Scientist Ottawa Research and Development Centre
Manitoba Corn Growers Association

Results
This project is part of a long-term, multi-site study led by Lana Reid. Research findings will be made available by Lana Reid and team.

Background
The objective will be achieved using conventional corn breeding methodology enhanced by double haploid inbred production and specialized screening techniques for cold tolerance and disease resistance. The trial is being conducted at sites across five Canadian provinces. The anticipated impact of developing earlier maturing, cold tolerant corn will expand the acreage of corn production in Canada.

Project findings
These data were generated for AAFC; however, due to intellectual property issues pertaining to Plant Breeders' Rights, results for individual lines are not provided in this report. For more information on this variety trial

Materials & Methods

Experimental Design	Random Complete Block Design
Entries	30 varieties
Seeding	Jun 5
Harvest	Nov 7

Data collected	**Date collected**
% Emergence	Jun 19
Tasseling Date	Jul 14 – Aug 9
Silking Date	Jul 22 – Aug 11
Ear Formation	Jul 27 – Aug 17
Heights	Aug 2
Lodging	Nov 7
Yield	Nov 7
Moisture	Nov 7

Agronomic info

Previous 2 years crop	Oat barley silage
Soil Type	Erickson Loam Clay
Landscape	Rolling with trees to the east
Seedbed preparation	No-till due to moisture concerns; direct-seeded into stubble

Table 1: Spring 2018 Soil Test

	Available	Needed
N	54 lb/ac	84 lb/ac
P	13 ppm	10 lb/ac
K	228 ppm	
S	118 lb/ac	

Table 2: Added N and P

Blend	Blend (actual lbs/ac)	Actual lbs N	Actual lbs P
46-0-0	178.01	81.88	0
11-52-0-0	19.23	2.12	10
Total	-	84	10

N banded with seed; P side-banded

Table 3: Pesticide Application

Crop stage	Date	Product	Rate
Pre-emerge	May 18	Heat	28.4g/ac
		Round-up	0.67L/ac
Pre-emerge	Jun 5	Heat	28.4 g/ac
		RoundUp	0.67 L/ac
In crop	Jul 30	Basagran	0.91 L/ac
		Centurion	0.15 L/ac

Agriculture Agri Food Canada Corn Nursery

Project duration May 2018 – November 2018
Objectives To develop and release early maturing cold tolerant corn inbreds with emphasis on the 1800-2000 CHU market.
Collaborators Lana Reid Ph.D – AAFC Research Scientist Ottawa Research and Development Centre

Background
The objective will be achieved using conventional corn breeding methodology enhanced by double haploid inbred production and specialized screening techniques for cold tolerance and disease resistance. The trial is being conducted at sites across five Canadian provinces. The anticipated impact of developing earlier maturing, cold tolerant corn will expand the acreage of corn production in Canada.

Project findings
This project is part of a long-term, multi-site study led by Lana Reid. Research findings will be made available by Lana Reid and team.

Materials & Methods

Experimental Design	500 row observation nursery
Entries	500
Seeding	Jun 5
Harvest	Nov 12

Data collected	**Date collected**
Tasseling Date	Jul 12 – Aug 13
Silking Date	Jul 16 – Aug 28
Ear Formation	Aug 1 – Sept 4
Heights	Aug 2
Moisture	Nov 12
Yield	Nov 12

Agronomic info

Previous 2 years crop	Oat barley silage
Soil Type	Erickson Loam Clay
Landscape	Rolling with trees to the east
Seedbed preparation	No-till due to moisture concerns; direct-seeded into stubble

Table 1: Spring 2018 Soil Test

	Available	Needed
N	54 lb/ac	84 lb/ac
P	13 ppm	10 lb/ac
K	228 ppm	
S	118 lb/ac	

Table 2: Added N and P

Blend	Blend (actual lbs/ac)	Actual lbs N	Actual lbs P
46-0-0	178.01	81.88	0
11-52-0-0	19.23	2.12	10
Total	-	84	10

N banded with seed; P side-banded

Table 3: Pesticide Application

Crop stage	Date	Product	Rate
Pre-emerge	May 18	Heat	28.4g/ac
		Round-up	0.67L/ac
Pre-emerge	Jun 5	Heat	28.4 g/ac
		RoundUp	0.67 L/ac
In crop	Jul 30	Basagran	0.91 L/ac
		Centurion	0.15 L/ac

Agriculture Agri Food Canada Sugarcorn Variety Evaluation

Project duration May 2018 – November 2018
Objectives To evaluate the potential for production of varieties of corn with high stalk sugar content in the Parkland region.

Collaborators Lana Reid Ph.D – AAFC Research Scientist Ottawa Research and Development Centre

Results
The corn varieties tested at Roblin grew well. Ear formation was late, ranging from the second to fourth week of August, resulting in negligible yields. However, stalk production was excellent. The biomass and stalk sugar content were not tested, but PCDF intends to repeat the test in 2019, with plans to evaluate biomass and sugar content at that time.

Project findings
The corn varieties tested at Roblin grew well. Ear formation was late, ranging from the second to fourth week of August, resulting in negligible yields. However, stalk production was excellent. The biomass and stalk sugar content were not tested, but PCDF intends to repeat the test in 2019, with plans to evaluate biomass and sugar content at that time.

Background
The project evaluated six lines of cold-tolerant corn identified by Lana Reid and others as having high stalk sugar content. Reid's findings suggest that the varieties tested have the potential to be a valuable source of ethanol and silage.

Materials & Methods

Experimental Design	Random Complete Block Design
Entries	6
Seeding	Jun 5
Harvest	Nov 7

Data collected	**Date collected**
Tasseling Date	Aug 2-15
Silking Date	Aug 7-22
Ear Formation	Aug 14-28
Heights	Aug 2
Lodging	Nov 7
Yield	Nov 7
Moisture	Nov 7

Agronomic info

Previous year's crop	Oat barley silage

Soil Type	Erickson Loam Clay
Landscape	Rolling with trees to the east
Seedbed preparation	No-till due to moisture concerns; direct-seeded into stubble

Table 1: Spring 2018 Soil Test

	Available	Needed
N	54 lb/ac	84 lb/ac
P	13 ppm	10 lb/ac
K	228 ppm	
S	118 lb/ac	

Table 2: Added N and P

Blend	Blend (actual lbs/ac)	Actual lbs N	Actual lbs P
46-0-0	178.01	81.88	0
11-52-0-0	19.23	2.12	10
Total	-	84	10

N banded with seed; P side-banded

Table 3: Pesticide Application

Crop stage	Date	Product	Rate
Pre-emerge	May 18	Heat	28.4g/ac
		Round-up	0.67L/ac
Pre-emerge	Jun 5	Heat	28.4 g/ac
		RoundUp	0.67 L/ac
In crop	Jul 30	Basagran	0.91 L/ac
		Centurion	0.15 L/ac

DuPont-Pioneer Corn Variety Demonstration

Project duration May 2018 – November 2018
Objectives Demonstrate early varieties of DuPont-Pioneer corn
Collaborators Jeremy Andres, DuPont-Pioneer representative

Results
Four varieties of DuPont-Pioneer corn were grown for demonstration purposes at the PCDF annual field day. Plots were taken to yield, but severe bird damage made yield comparisons not useful. The varieties grown were P7005AM, P7202AM, P7211HR, and P7213R.

Materials & Methods

Experimental Design	Demonstration; 4 x 50m plots per variety
Seeding	Jun 5
Harvest	Nov 12

Data collected	**Date collected**
Tasseling Date	Jul 12 – Aug 13
Silking Date	Jul 16 – Aug 28
Ear Formation	Aug 1 – Sept 4
Heights	Aug 2
Moisture	Nov 12
Yield	Nov 12

Agronomic info

Previous 2 years crop	Oat barley silage
Soil Type	Erickson Loam Clay
Landscape	Rolling with trees to the east
Seedbed preparation	No-till due to moisture concerns; direct-seeded into stubble

Table 1: Spring 2018 Soil Test

	Available	Needed
N	54 lb/ac	84 lb/ac
P	13 ppm	10 lb/ac
K	228 ppm	
S	118 lb/ac	

Table 2: Added N and P

Blend	Blend (actual lbs/ac)	Actual lbs N	Actual lbs P
46-0-0	178.01	81.88	0
11-52-0-0	19.23	2.12	10
Total	-	84	10

N banded with seed; P side-banded

Table 3: Pesticide Application

Crop stage	Date	Product	Rate
Pre-emerge	May 18	Heat	28.4g/ac
		Round-up	0.67L/ac
Pre-emerge	Jun 5	Heat	28.4 g/ac
		RoundUp	0.67 L/ac
In crop	Jul 30	Basagran	0.91 L/ac
		Centurion	0.15 L/ac

Agriculture Agri-Food Canada Conventional Soy Protein Variety Evaluation

Project duration	May 2018 – October 2018
Objectives	The project tests 20 varieties of conventional soybean as part of a broader project examining protein differences between eastern and western Canada sites
Collaborators	Elroy Cober – Research Scientist, soybean breeding and genetics, AAFC Kirsten Slusarenko – Soybean breeding AAFC

Results

This project is part of a long-term 5-year multi-site study across Canada, led by Elroy Cober. Research findings will be made available by Elroy Cober and team.

Background

Roblin is one of many sites across Canada taking part in this project to determine soybean protein content differences between eastern and western Canadian growing sites.

Materials & Methods

Experimental Design	Rectangular lattice
Entries	24 entries
Seeding	May 22
Harvest	Oct 15

Data collected	**Date collected**
Emergence	Jun 2-5
Flowering	Jul 18-24
Visual Rating	Jun 25
Heights	Aug 2
Maturity	Sept 5-7
Lodging	Oct 15
Yield	Oct 18
Moisture	Oct 18

Agronomic info

Previous 2 years crop	Oat barley silage
Soil Type	Erickson Loam Clay
Landscape	Rolling with trees to the east
Seedbed preparation	No-till due to moisture concerns; direct-seeded into stubble

Table 2: Spring 2018 Soil Test

	Available
N	54 lb/ac
P	13 ppm
K	228 ppm
S	118 lb/ac

Table 3: Added N and P

Blend	Blend (actual lbs/ac)	Actual lbs N	Actual lbs P
46-0-0	28.01	15	0
11-52-0-0	19.23	2.12	10
Total	-	17.12	10

N side-banded; P Banded with seed

Table 4: Pesticide Application

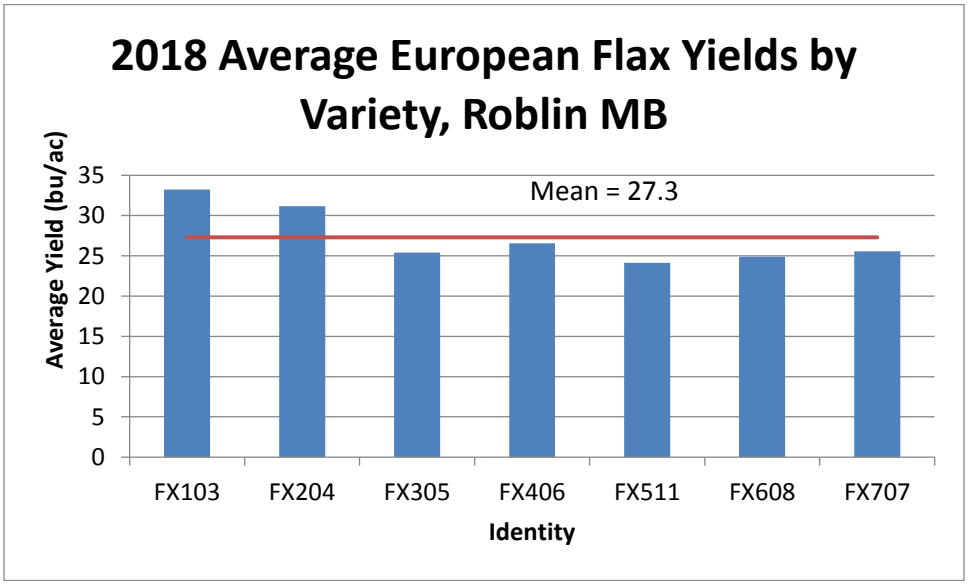
Crop stage	Date	Product	Rate
Pre-emerge	May 18	RoundUp	0.67 L/ac
		Heat	28.4g/ac
In-crop	Jul 13	Centurion	0.15 L/ac
		Basagran	0.91L/ac
Desiccation	Sept 14	Reglone	0.175 L/ac

European Flax Germplasm Evaluation Project

Project duration May 2018 – September 2018
Objectives To examine the suitability of European flaxseed lines for the Manitoba agro-climate
Collaborators Dane Froese – Oilseeds Industry Development Specialist – Manitoba Agriculture

Results

Figure 1: 2018 Average European Flax Yields by Variety, Roblin MB



Background
Examination of the suitability of European flaxseed lines for the Manitoba agro-climate

Materials & Methods

Experimental Design	Random Complete Block Design
Entries	7
Seeding	May 22
Harvest	Oct 11
Varieties	FX707 FX103 FX608 FX511 FX305 FX406 FX204

Data collected	**Date Collected**
Emergence	May 29 – June 1
Vigor	Jun 20
First flowering	Jul 3-9
Last flowering	Jul 15-20
Boll colour change	Jul 31 – Aug 15

Maturity	Aug 22 – Sept 4
Lodging	October 11
Yield	Oct 15
Moisture	Oct 15

Agronomic info

Previous 2 years crops	Oat Barley Silage
Soil Type	Erickson Loam Clay
Landscape	Rolling with trees to the east
Seedbed preparation	No-till due to moisture concerns; direct-seeded into stubble

Table 1: Spring 2018 Soil Test

	Available
N	54 lb/ac
P	13 ppm
K	228 ppm
S	118 lb/ac

Table 2: Added Fertilizer

Blend	Blend (actual lbs/ac)	Actual lbs N	Actual lbs P
46-0-0	171.49	81	0
11-52-0-0	19.23	2.12	10
Total	-	98.12	10

N side-banded; P Banded with seed

Table 4: Pesticide Application

Stage	Date	Product	Rate
Pre-emerge	May 24	Curtail M	0.81 L/ac
In-crop	Jul 19	Centurion	0.15 L/ac
		Amigo	0.5 L/ac
		Curtail M	0.81L/ac
Desiccation	Sept 14	Reglone	0.175 L/ac

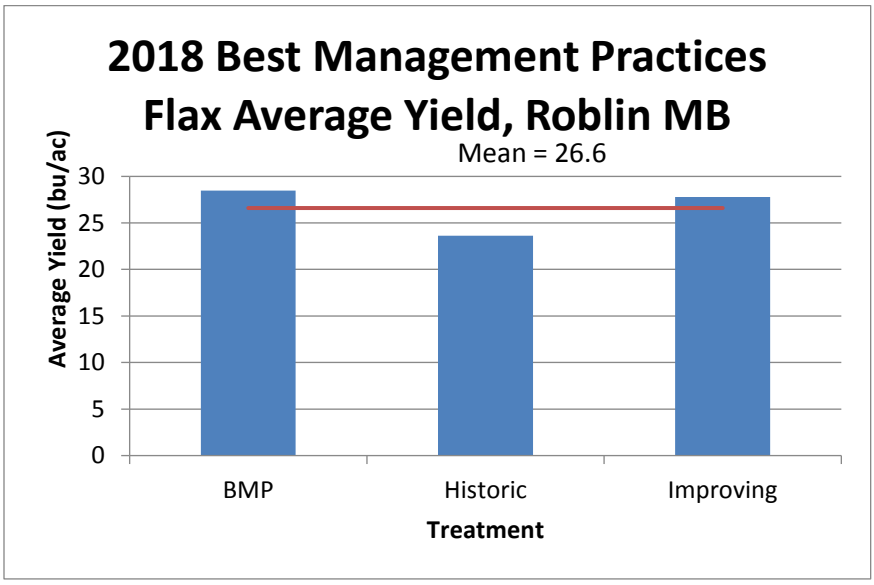
Best Management Practices for Flax Demonstration

Historical, Improving and BMP practices

Project duration	May 2018 – September 2018
Objectives	To demonstrate flax management practices via comparison of historical, improving and BMP practices.
Collaborators	Dane Froese – Manitoba Agriculture Oilseeds Industry Development Specialist

Results

Figure 1: 2018 Best Management Practices Flax Average Yield, Roblin MB



Project findings

The trial demonstrated three management approaches for flax production, for the purpose of improving understanding of flax production practices. Data collected are listed below.

Materials & Methods

Experimental Design	Demonstration
Entries	3
Treatments	See Table 2

Agronomic info

Previous 2 years crop	Oat Barley Silage
Soil Type	Erickson Loam Clay
Landscape	Rolling with trees to the east

Seedbed preparation	No-till due to moisture concerns; direct-seeded into stubble
Seeding	See Table2
Harvest	Oct 11

Data collected

Emergence Population	As emerged by seeding date
Flowering Population	July 9-23
Harvest Plant Counts	Beginning of Sept
Maturity	Aug 23 – Sept 19
Yield	Oct 12
Moisture	Oct 12

Table 1: Spring 2018 Soil Test

	Available
N	54 lb/ac
P	13 ppm
K	228 ppm
S	118 lb/ac

Table 2: Treatment Design

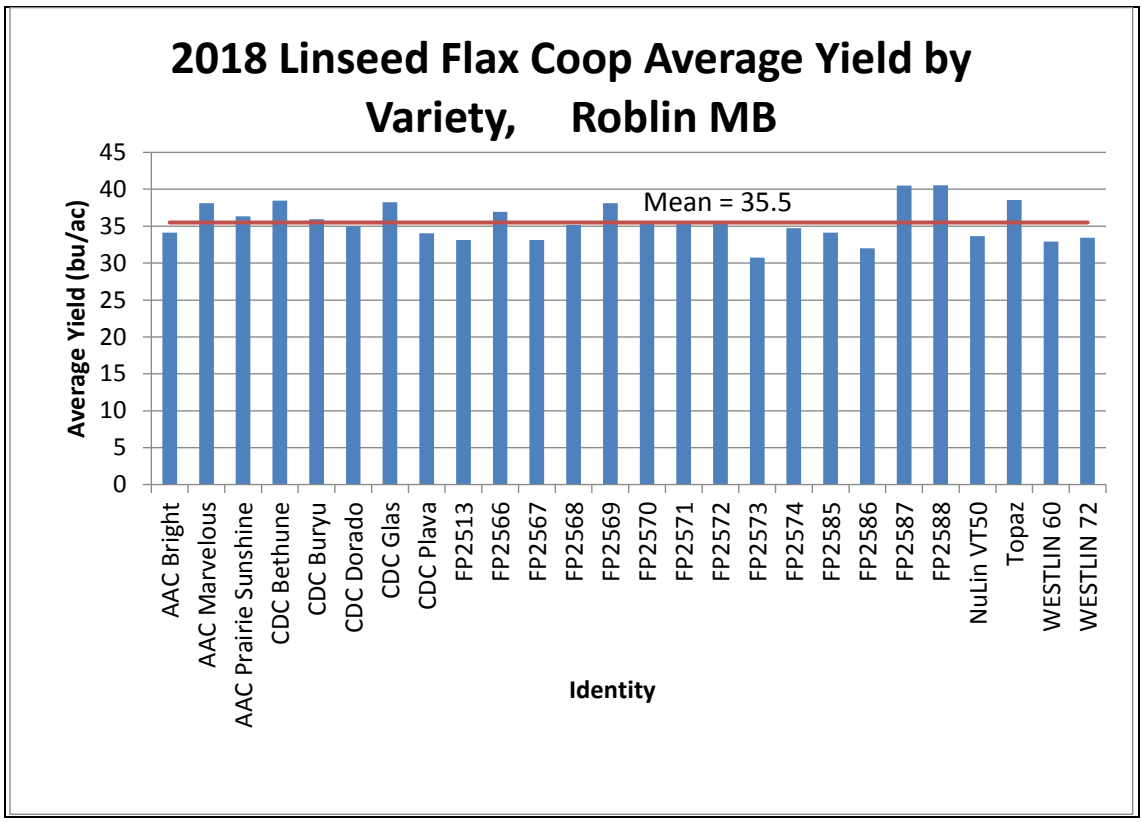
Action	Historic Farmer	Improving Farmer	BMP Farmer
Pre-Emerge Herbicide	None	Roundup	Roundup
Seed Treatment	None	None	Yes
Stubble	Cereal	Cereal	Cereal
Seed Date	June 5	May 28	May 22
Seed Rate	42 lbs/ac	56 lbs	70 lbs/ac
Seed Depth	1”	0.75”	0.5”
Target Fert. (lbs/ac Soil + Applied)	70N + 25 P	80 N + 25 P	110 N + 35 P
In-crop Herbicides	Centurion	Centurion	Centurion
Fungicide	None	Headline EC	Priaxor
Desiccant	Swath	Swath	Reglone

Linseed Flax Coop Variety Evaluation

Project duration May 2018 – September 2018
Objectives To evaluate pre-registration varieties for the Linseed Coop.
Collaborators Helen Booker – University of Saskatchewan Plant Sciences Flax Breeder
Ken Jackle – Crop Development Centre Flax Breeding Program

Results

Figure 1: 2018 Linseed Coop Average Yields by Variety (bu/ac) Roblin, MB



Background/References/Additional Resources
The trial was conducted in partnership with Helen Booker and the Prairie Recommending Committee for Oilseeds (PRCO). For further information, contact helen.booker[at]usask.ca.

Materials & Methods

Experimental Design	Random Complete Block Design
Entries	26
Seeding	May 25
Harvest	Oct 11
Varieties	See Table 1

Table 1: Varieties included in trial at Roblin 2018

AAC Bright	FP2587	WESTLIN 72	FP2567
CDC Bethune	FP2585	WESTLIN 60	FP2570
CDC Glas	FP2588	AAC Prairie Sunshine	FP2574
Topaz	CDC Buryu	AAC Marvelous	FP2586
FP2566	CDC Plava	FP2568	FP251
FP2569	CDC Dorado	FP2571	FP2573
FP2572	NuLin VT50		

Data collected	**Date collected**
Emergence	Jun 1-5
Vigor	Jun 20
Height	Aug 2
Determinate Habit	Aug 19 – Sept 10
Dry down Habit	Aug 19 – Sept 10
Maturity	Aug 19 – Sept 10
Lodging	Oct 11
Yield	Oct 11
Moisture	Oct 11

Agronomic info

Previous 2 years crops	Oat Barley Silage
Soil Type	Erickson Loam Clay
Landscape	Rolling with trees to the east
Seedbed preparation	Tilled and sprayed

Table 1: Spring 2018 Soil Test

	Available
N	54 lb/ac
P	13 ppm
K	228 ppm
S	118 lb/ac

Table 2: Added N and P

Blend	Blend (actual lbs/ac)	Actual lbs N	Actual lbs P
46-0-0	171.49	81	0
11-52-0-0	19.23	2.12	10
Total	-	83.12	10

P banded with seed; N side-banded

Table 3: Pesticide Application

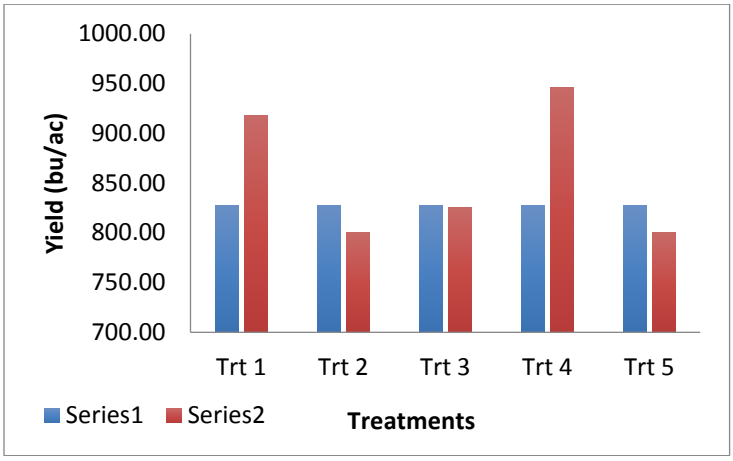
Stage	Date	Product	Rate
Pre-emerge	May 20	RoundUp	0.67 L/ac
In-crop	Jun 8	RoundUp	0.67 L/ac
		Heat	28.4 g/ac
	Jul 19	Centurion	0.15 L/ac
		Amigo	0.5 L/ac
		Curtail M	0.81L/ac
Desiccation	Sept 14	Reglone	0.175 L/ac

Hemp Genetics International PGE Tech Treatment

Project duration May 2018 – August 2018
Objectives To evaluate PGETech as a seed foliar fertility treatment
Collaborators Jeff Kostiuk

Results

Figure 1: Yield Comparison by Treatment



Series 1 represents the control treatment

Background
PGE Tech works in the production of plant products with mineral based micronutrient plant growth enhancers. Their products are made from natural ingredients, are "eco-friendly" and require no special equipment or protective clothing to use. This trial looked at growing of hemp with the use PGE Tech either as a seed treatment or as a spray or both.

Materials & Methods

Experimental Design	Random Complete Block Design
Entries	6 treatments x 4 replications
Seeding	May 28
Harvest	Aug 22

Table 1: PGR Application Timing

Treatment	PGE Seed Treatment	PGE Spray	Fertilizer
Control	Bare seed	None	None
1	Bare Seed	Sprayed	70% of target fertility
2	Bare seed	None	None
3	Bare seed	None	100% target fertility

4	Seed treated	None	None
5	Seed treated	Sprayed	100% target fertility

Data collected	**Date collected**
Emergence	Jun 4-8
Plant Counts	Jun 11
Flowering	Jul 18-20
Disease rating	Aug 3
Height	Aug 2
Lodging	Aug 22
Yield	Sept 3
Moisture	Sept 3

Agronomic info

Previous year's crop	Oat barley silage
Soil Type	Erickson Loam Clay
Landscape	Rolling with trees to the east
Seedbed preparation	No-till due to moisture concerns; direct-seeded into stubble

Table 2: Spring 2018 Soil Test

	Available	Needed
N	54 lb/ac	76 lb/ac
P	13 ppm	10 lb/ac
K	228 ppm	0 lb/ac
S	118 lb/ac	0 lb/ac

Table 3: 100% Target Added N and P Fertilizer

Blend	Blend (actual lbs/ac)	Actual lbs N	Actual lbs P
46-0-0	160.62	76	0
11-52-0-0	19.23	2.12	10
Total	-	78.12	10

N side-banded; P Banded with seed

Table 4: Herbicide Application

Crop stage	Date	Product	Rate
Pre-emerge	May 19	Heat	28.4g/ac
In-crop	June 20	Round-up	0.67L/ac
		Brotex 240	0.5 L/ac
		Centurion	0.15 L/ac

Parkland Industrial Hemp Growers Plant Growth Regulator Evaluation

Project duration May 2018 – August 2018
Objectives To evaluate wheat varieties for the Parkland Coop
Collaborators Keith Watson

Results
The results are shown below in Figures 1 and 2. Although PGR application appears to have reduced the overall height of the plants compared to the control, there were no significant differences between treatments. This suggests that application of PGR does not reliably reduce the height of the hemp variety (Canda) for the application stages used in this trial.

Figure 1: Difference in Height by PGR Application Timing

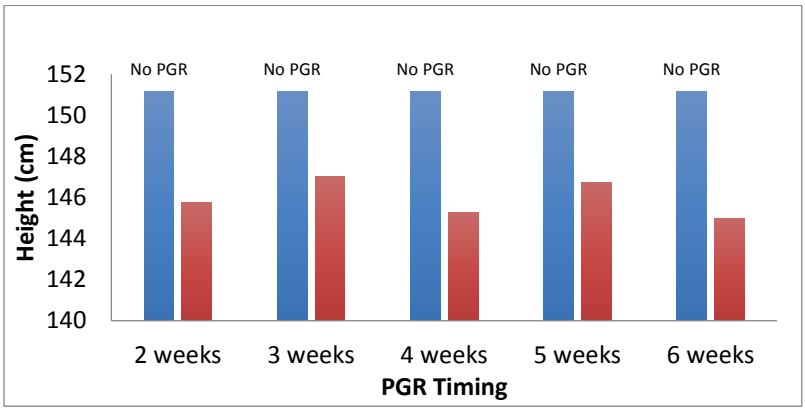
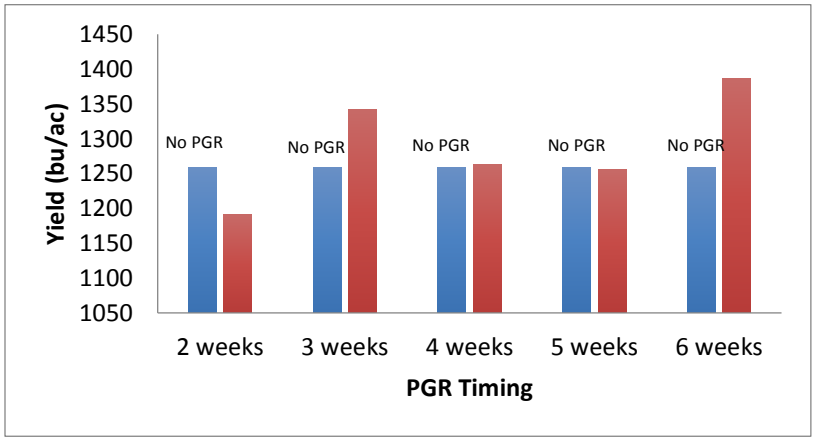


Figure 2: Difference in Yield by PGR Application



Background
Field management of hemp continues to be a concern to hemp growers. In particular, hemp growers who are not looking for a fibre harvest but who are rather growing for the grain harvest, are looking for ways to manage the height of the hemp plant in order to make it easier to get off the field.

PCDF and PIHG co-developed a trial looking at the effect of differently timed applications of PGRs on height and on yield.

Materials & Methods

Experimental Design	Random Complete Block Design
Entries	6 treatments x 4 replications
Seeding	May 28
Harvest	August 22

Table 1: PGR Application Timing

Treatment	PGR Timing
1	PGR two weeks after seeding
2	PGR three weeks after seeding
3	PGR four weeks after seeding
4	PGR five weeks after seeding
5	PGR six weeks after seeding
6	No PGR

PGR Manipulator applied to selected plots according to this schedule

Data collected	**Date collected**
Emergence	Jun 4-9
Plant Counts	Jun 11
Flowering	Jul 18-20
Disease rating	Aug 3
Height	Aug 2
Lodging	Aug 22
Yield	Sept 3
Moisture	Sept 3

Agronomic info

Previous year's crop	Oat barley silage
Soil Type	Erickson Loam Clay
Landscape	Rolling with trees to the east
Seedbed preparation	No-till due to moisture concerns; direct-seeded into stubble

Table 2: Spring 2018 Soil Test

	Available	Needed
N	54 lb/ac	76 lb/ac
P	13 ppm	10 lb/ac
K	228 ppm	0 lb/ac
S	118 lb/ac	0 lb/ac

Table 3: Added N and P Fertilizer

Blend	Blend (actual lbs/ac)	Actual lbs N	Actual lbs P
46-0-0	160.62	76	0
11-52-0-0	19.23	2.12	10
Total	-	78.12	10

N side-banded; P Banded with seed

Table 4: Herbicide Application

Crop stage	Date	Product	Rate
Pre-emerge	May 19	Heat	28.4g/ac
		Round-up	0.67L/ac
In-crop	Jun 20	Brotex 240	0.5 L/ac
		Centurion	0.15 L/ac

National Industrial Hemp Fibre and Grain Variety Evaluation

Project duration May 2018 – August 2018
Objectives To evaluate hemp grain and fibre varieties for the Canadian Hemp Trade Alliance
Collaborators Canadian Hemp Trade Alliance

Results Grain yield results are available through the SEED Manitoba guide (2018). Graphical yield results for each of the four Manitoba research sites are displayed below according to grain and fibre yields.

Figure 1: 2018 Hemp Fibre Yield Results at Roblin, 2018

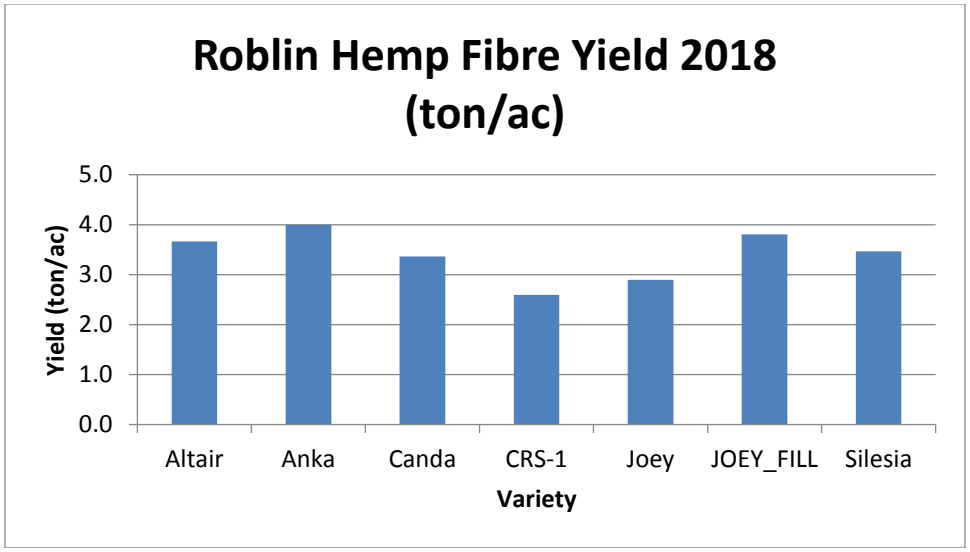


Figure 2: 2018 Hemp Grain Yield Results at Roblin, 2018

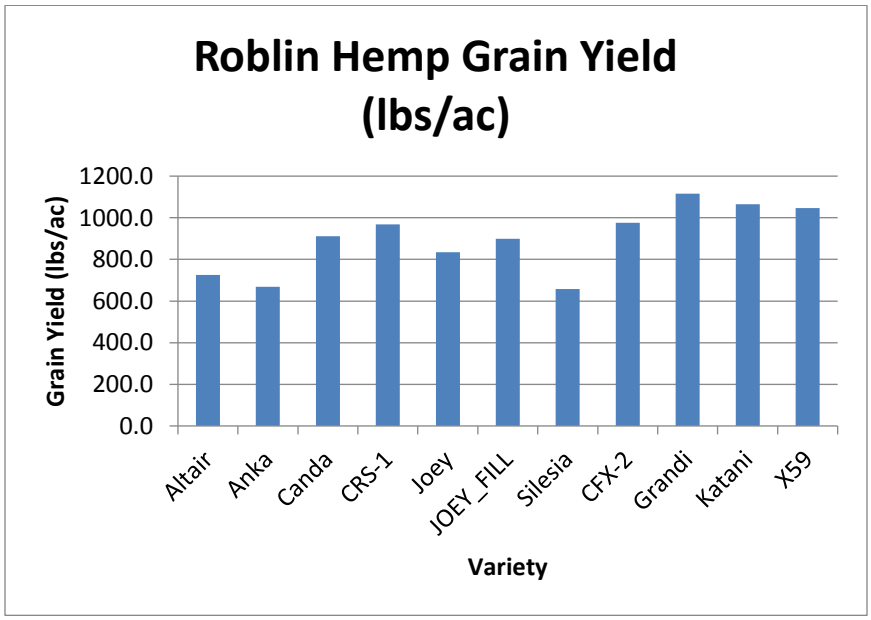


Figure 3: Hemp Fibre Yield Results at Carberry, 2018

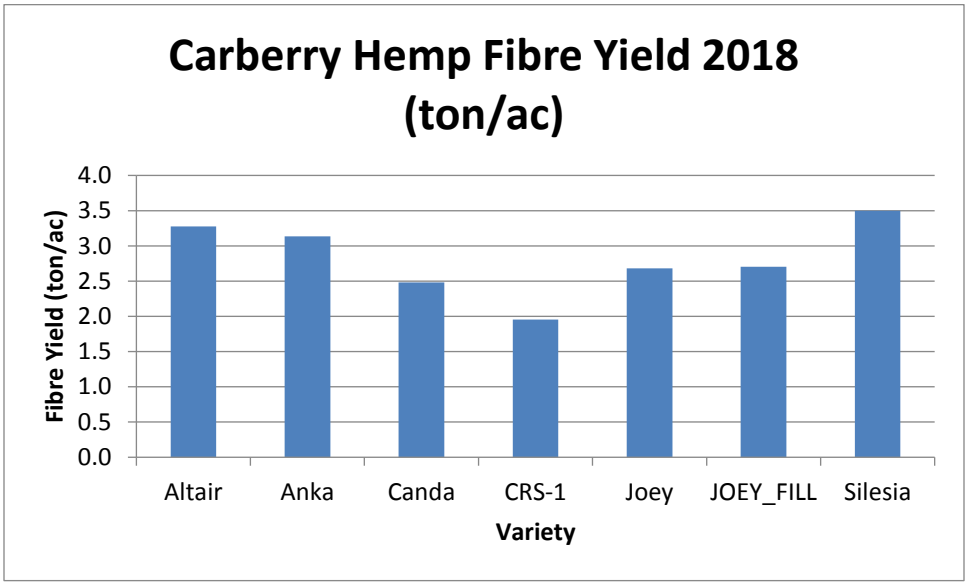


Figure 4: 2018 Hemp Grain Yield Results at Roblin, 2018

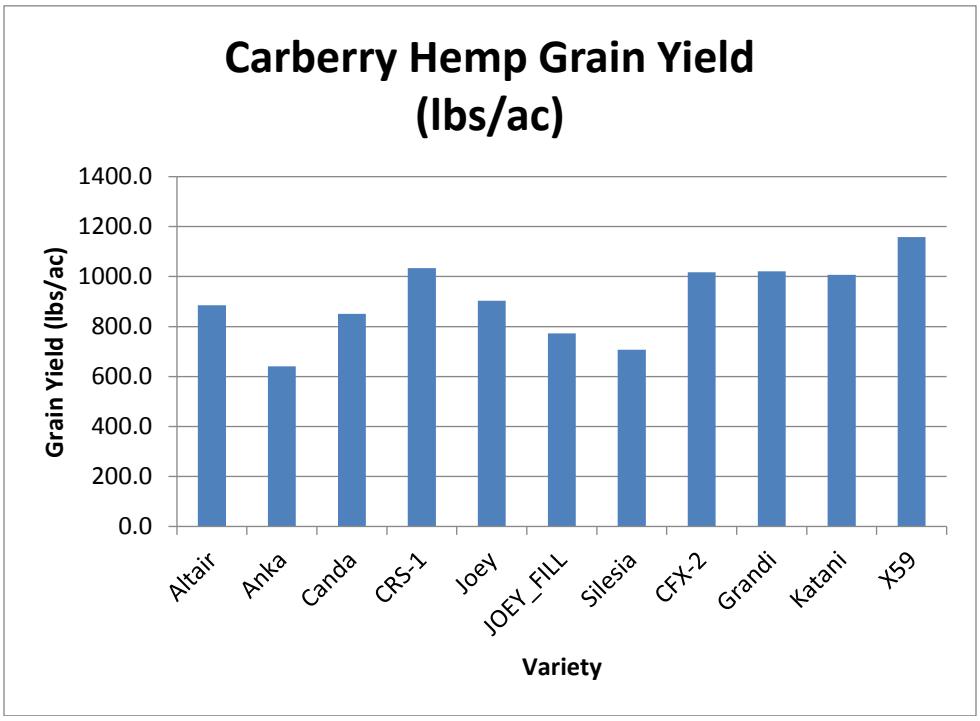


Figure 5: Hemp Fibre Yield Results at Arborg, 2018

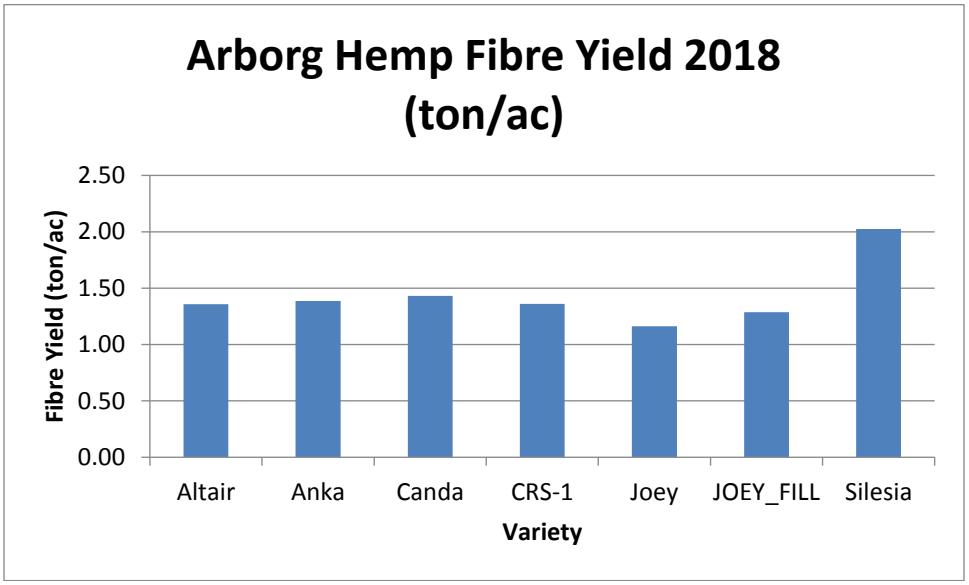


Figure 6: 2018 Hemp Grain Yield Results at Arborg, 2018

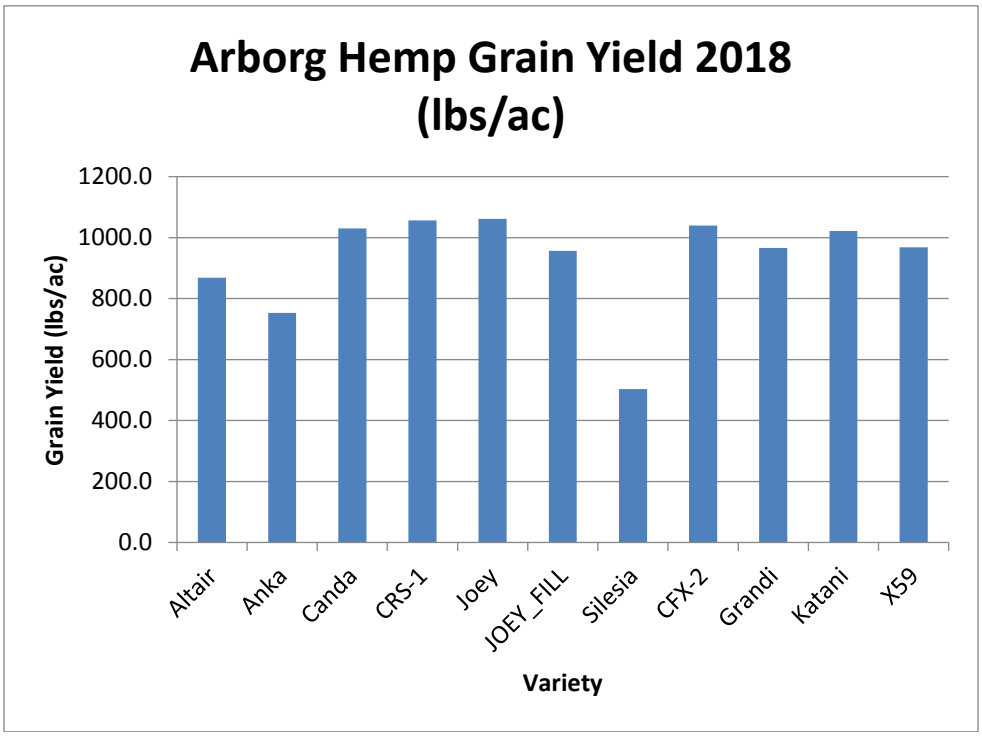


Figure 7: Hemp Fibre Yield Results at Melita, 2018

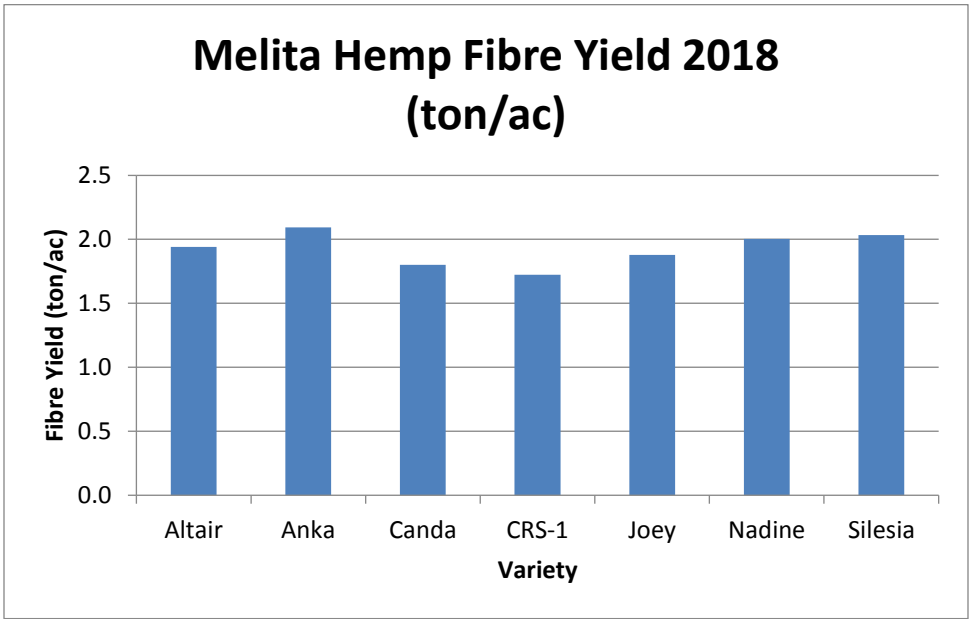
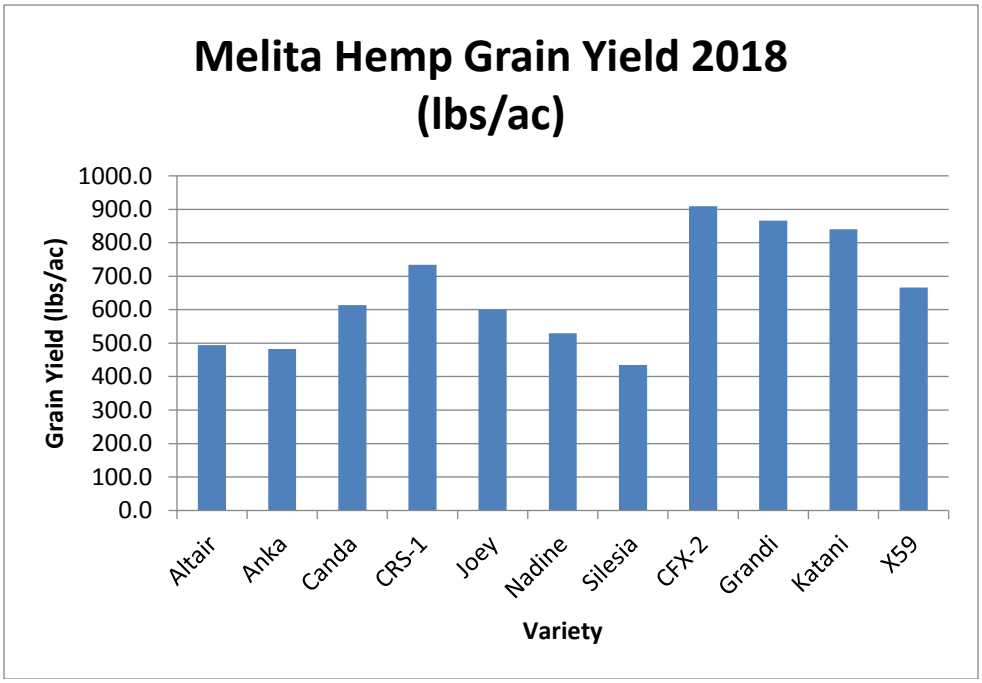


Figure 8: 2018 Hemp Grain Yield Results at Melita, 2018



Background

The Canadian Hemp Trade Alliance (CHTA) is a not-for-profit organization which represents over 260 growers across all 10 provinces as well as numerous processors, distributors, developers and researchers involved in Canada's rapidly growing industrial hemp industry.

There were a number of new developments in Canadian legislation in 2018 which very directly affects Canadian hemp growers. The CHTA website outlines these new developments, specifically the changes in Cannabis legislation as well as Health Canada's revision of Section 56 of the Controlled Drugs and Substances Act (CDSA). These changes now allow hemp farmers to immediately collect and store industrial hemp flower, bud and leaf material, a vital piece which was previously prohibited.

Jason Green, Head of Agriculture with Canopy Hemp and Director of the CHTA explains that this new permission allows hemp growers to learn more about the harvesting, drying and storing of their harvest materials, a key component in then bringing their product to market.

This trial looked at separate grain and fibre varieties of hemp.

Roblin Materials & Methods

Experimental Design	Random Complete Block Design
Entries	5 grain entries and 7 fibre entries x 4 replications
Seeding	May 28
Harvest	Aug 22
Varieties	See Table 1

Table 1: 2018 Hemp Varieties

Fibre	Grain
Anka	CFX-2
Silesia	X59
Canda	Katani
Joey-fill	Grandi
Altair	CRS-1
CRS-1	
Joey	

Data collected	**Date collected**
Emergence	Jun 4-6
Plant Counts	Jun8 and Jul 16
Heading	Jul 6-11
Flowering	Jul 18-19
Male/Female ratio	Aug 15
Maturity	Aug 8-22
Height	Aug 2
Disease	Aug 5
Lodging	Aug 22
Yield	Sept 3
Moisture	Sept 3

Roblin Agronomic info

Previous year's crop	Oat barley silage
Soil Type	Erickson Loam Clay
Landscape	Rolling with trees to the east
Seedbed preparation	No-till due to moisture concerns; direct-seeded into stubble

Table 2: Spring 2018 Soil Test

	Available	Needed
N	54 lb/ac	76 lb/ac
P	13 ppm	10 lb/ac
K	228 ppm	0 lb/ac
S	118 lb/ac	0 lb/ac

Table 3: Added N and P Fertilizer

Blend	Blend (actual lbs/ac)	Actual lbs N	Actual lbs P
46-0-0	160.62	76	0
11-52-0-0	19.23	2.12	10
Total	-	78.12	10

N side-banded; P Banded with seed

Table 4: Herbicide Application

Crop stage	Date	Product	Rate
Pre-emerge	May 19	Heat	28.4g/ac
		Round-up	0.67L/ac
In-crop	Jun 20	Brotex 240	0.5 L/ac
		Centurion	0.15 L/ac

Fruit Demonstration

Established May 2018
Objectives To demonstrate varieties of fruits being developed by the University of Saskatchewan
Collaborators Bob Bors – University of Saskatchewan Project Leader Domestic Fruit Program

Background/References/Additional Resources

Dwarf sour cherries are not a native crop to the Canadian Prairies. They are the product of a number of crosses were initially begun by Dr. Les Kerr of the University of Saskatchewan by crossing a cold hardy cherry from Siberia, *Prunus fruiticosa,* with a sour cherry originating in Europe (brought over by settlers) by the name of *Prunus cerasus.* Since then the development has continued by incorporations of other cherries and by the use of dwarfing root stalks. The advantage of the dwarfing root stalk is that it forces earlier fruiting from the plant and it also creates a more workable tree when harvesting, for both manual and mechanical pickers. Dwarf sour cherries constitute the very typical "cherry pie filling" cherry.

The Haskap berry was introduced to Canada around 1967 and now grows across the country, thanks to new varieties developed by the University of Saskatchewan. Fruit growers should consider planting Haskap berries in their orchards because they attract fewer pests and require little maintenance. Manitoba and the rest of the Canadian prairies are a natural fit for Haskap because of its cold craving nature. Haskap is also the first berry to ripen and pickers can enjoy the berry beginning in the mid-June. Haskaps have a sort of blueberry/raspberry feel to them – tart, but perfect for baking.

Birds are of course a problem for both of the above fruits and appropriate measures must be taken to prevent the loss of berries.

Results
2018 proved to be a very poor year for fruit in the Roblin area. Additionally, heavy bird loses were observed at the PCDF research site.

Materials & Methods

Entries	4 Haskap varieties; 5 Dwarf Sour Cherry varieties
Agronomic info	
Soil Type	Erickson Loam Clay
Landscape	Rolling with trees to the east
Planted	June 2009

Table 1: Dwarf Sour Cherry and Haskap Varieties

Haskap	Cherry
Borealis	Valentine
Tundra	Romeo
9-92	Juliet
9-15	Carmine Jewel
	Cupid

Hopyard Variety Evaluation

Established May 2018
Objectives To evaluate varieties of hops for production on the Prairies
Collaborators James Frey – Diversification Specialist, Manitoba Agriculture
Haider Abbas – Diversification Technician, Manitoba Agriculture
Jessica Frey – Research Technician, PCDF

Project findings: Establishment year – no findings

Background/References/Additional Resources
Production of hops is a growing interest in Manitoba. This is especially true as interest in Winnipeg and other cities surrounding locally sourced grains and hops for their craft brews continues to grow. Entrepreneurs in this industry all say that there is definitely room for more growers and as such Manitoba Agriculture seeks to establish a demonstration for interested parties.

Diversification does not only take place a field scale, and horticultural opportunities such as hops provide alternatives for smaller acreage owners. Growers of hops all describe the spicy sweet scents of ripening hops. They are extremely fragrant and the different varieties each offer different qualities to the beers that are produced from them. Equipment for planting and harvesting are available. An August article in the *Manitoba Cooperator* described how hops growers received funding through the Canadian Agricultural Partnership (CAP) for harvesting equipment.

Hops quickly grow up to 19 feet in length by the end of June and working to get them properly strung up can provide for very busy work in the first part of the growing season. Once harvested, they are ideally pressed into pellets which are the preferred form for brewers. Some growers are looking at providing this service for other growers and others have devised their own means of producing pellets. The size of the operation will determine what is needed for individual growers.

Materials & Methods

Experimental Design	Random Complete Block Design
Entries	6 varieties in 3 repetitions
Varieties	See Table 1

Table 1: Hops Varieties at Roblin

Chinook	Willammette
Centennial	Nugget
Golden	Cascade

Agronomic info

Previous 2 years crop	Flax (2017), Fallow (2016)
Soil Type	Erickson Loam Clay
Landscape	Rolling with trees to the east
Planted	June 2018
Added Fertility	Composted sheep manure

Pea Demonstration

Project duration May 2018 – August 2018
Objectives To demonstration different pea varieties
Collaborators James Frey – Diversification Specialist, Manitoba Agriculture
Haider Abbas – Diversification Technician, Manitoba Agriculture
Jessica Frey – Research Technician, PCDF

Background
Interest in pea production is growing as the Roquette Pea Processing plant resumes construction in Portage la Prairie. Although they currently do not expect to be up and running until the second half of 2020, now is the time to be looking at the possibilities that will soon be opening up to farmers. This demonstration was intended to showcase different green, yellow and maple varieties. Unfortunately the yellow varieties had to be discontinued due to poor establishment.

Table 1: Varieties included in demonstration at Roblin 2018

Yellow Varieties	Maple Variety	Green Varieties
AAC Ardill	AAC Liscard	AAC Comfort
AAC Carver		AAC Radius
AAC Lacombe		AAC Royce
Agassiz		CDC Greenwater
CDC Amarillo		CDC Limerick
CDC Golden		CDC Patrick
CDC Inca		CDC Striker
CDC Meadow		
CDC Saffron		

Agronomic info

Previous 2 years crop	Flax (2017), mixed crops (2016)
Soil type	Erickson Loam Clay
Landscape	Rolling with trees to the east
Seedbed preparation	No-till due to moisture concerns; direct-seeded into stubble

Table 2: Spring 2018 Soil Test

	Available
N	54 lb/ac
P	13 ppm
K	228 ppm
S	118 lb/ac

Added Fertility
Fertilized with 10 lbs/ac P

6-Year Rotation of Integrated Soil Management

Green Manure Year

Project duration May 2018 – October 2018
Objectives To examine the potential benefits of a six-year crop rotation using herbicides and green manures for fertility management
Collaborators James Frey – Diversification Specialist, Manitoba Agriculture
Haider Abbas – Diversification Technician, Manitoba Agriculture
Jessica Frey – Research Technician, PCDF

Results

A biomass sample was taken at flowering at the end of July providing a yield of 6100 lbs/ac (dry weight). Following the fieldwork of Martin Entz's organic crops laboratory, we assume 2.5% nitrogen content of the green manure, which equates to 152 lbs/ac N. The crop was disked at the end of July, and some regrowth occurred, helping to sequester the N.

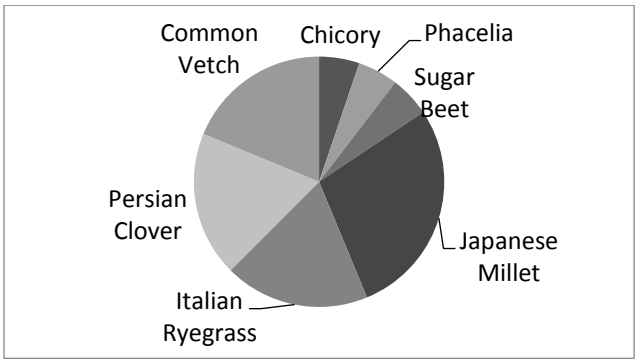
Background

Growing green manures to provide nitrogen to the cropping system is a key element of organic crop production. This project compares using green manures for nitrogen production in a system with and without herbicides, granular phosphorus and tillage. The project will compare overall production costs between the treatments and conventional production.

The 2018 season was a green manure year. In 2019, wheat plots will be established.

Materials and Methods

Figure 1: 2018 Green Manure Blend Breakdown



Agronomic info

Previous 2 years crop	Summer fallow
Soil type	Erickson Loam Clay
Landscape	Rolling with trees to the east
Seedbed preparation	Tilled and sprayed

Seeding Rate	11 lbs/ac blend plus 30 lbs/ac oats plus 40 lbs/ac legume
Termination	Disked July 28

Table 1: Spring 2018 Soil Test

	Available
N	150 lb/ac
P	23 ppm
K	181 ppm

Added Fertility

Fertilized with 10 lbs/ac P

Oat Cover Crop

Project duration May 2018 – September 2019
Objectives To demonstrate the use of cover cropping strategies
Collaborators Parkland Crop Diversification Foundation

Results

Table 1: Oat Yield by Cover Crop in lbs/ac

Cover Crop	Oat Yield
Oat / Alfalfa	3970.3
Oat / Alsike Clover	5026.5
Oat / Cicer Milk Vetch	5069.4
Oat / Fall Rye	1810.8
Oat / Italian Ryegrass	3418.0
Oat / Persian Clover	4300.1
Oat / Red Clover	5534.2
Oat / Subterr. Clover	5364.9
Oat / White Clover	4313.2
Oat / Yellow Sweet Clover	4746.0
Oat only	4589.4

Cover crop establishment results will be determined in 2019. Biomass for the crops will be taken at flowering, and yield measurements will be obtained at maturity.

Project findings
The success of the oat establishment varied according to cover crop. Establishment (reflected in yield) with clovers was on par with the PCDF site average, but lower for fall rye and Italian ryegrass. This is due to allelopathic compounds produced by fall rye and Italian ryegrass, making the crops very competitive with other plants. There was no lodging in the oats and harvest was very smooth.

Background/References/Additional Resources
Cover cropping as a part soil management is of growing interest to many Manitoba farmers. Cover crops perform a number of significant functions for the soil, including but not limited to: controlling soil erosion after harvest of the cash crop; sequestering and increasing soil nutrients; and, improving water infiltration. Seeding a cover crop with the cash crop can reduce fieldwork in Year 2, allowing the cover crop to be used as a source of fertility (i.e. green manure), forage crop or cash crop.

Materials & Methods

Experimental Design	Random Complete Block Design
Entries	11

Data collected	**Date Collected**
Vigor	June 25

Yield	Sept 20
Moisture	Sept 20

Agronomic info

Previous 2 years crop	Summer fallow
Soil Type	Erickson Loam Clay
Landscape	Rolling with trees to the east
Seedbed preparation	Tilled and sprayed
Seeding	June 13
Harvest	Sept 20

Table 1: Spring 2018 Soil Test

	Available
N	150 lb/ac
P	23 ppm
K	181 ppm

Added Fertility

10lbs/ac actual P and 2.11lbs/ac actual

Oat-Hairy Vetch Intercropping Demonstration

Project duration May 2018 – September 2019
Objectives To demonstrate the use of intercropping for grain, forage and soil nutrient management
Collaborators Parkland Crop Diversification Foundation

Results
Data presented here are for year one of this two-year demonstration. The outputs for the first year were oat yield and straw feed values (total straw yield was not obtained). Outputs for year two will include biomass at flowering, cereal re-establishment and yield, and hairy vetch seed production.

According to the preliminary results of this trial, hairy vetch improves the feed value of oat straw, and potentially makes is comparable to an alfalfa-grass mix. The following table also shows high values for micronutrients.

Table 1: Feed Value of Oat Straw Combined with Hairy Vetch

Feed type	Crude Protein %	TDN %
Hairy vetch only	27.33	69.74
Hairy vetch plus oat straw	13.33	59.94
Oat straw only (comparison)	5.44	48.21
First-cut alfalfa-grass (comparison)	13.12	57.57
Recommended requirements 1400 lb cow, mid-3rd pregnancy	7.00	55.00

Project findings
Establishment of both the oats and the hairy vetch were successful. The land was in summer fallow (2016) and a pea-oat cover crop (2017). As such the land was extremely fertile. Lodging in the oats was completely absent as the hairy vetch provided a support. Harvest was very smooth, and the vetch passed through the combine without wrapping. Year two of this trial will involve a biomass sample taken at flowering, evaluating re-establishment and yield for a cereal crop sown into the vetch, and harvesting vetch seed at maturity.

Background/References/Additional Resources
Cover cropping as a part soil management is of growing interest to many Manitoba farmers. Cover crops perform a number of significant functions for the soil, including but not limited to: controlling soil erosion after harvest of the cash crop; increasing soil nutrients; and improving water infiltration.

Potential advantages of the system include:

- Grain yield (for own feed or commercial use)
- Straw feed value comparable to first-cut alfalfa
- Hairy vetch remains alive at the end of the season, acting as a catch crop for nutrients

- Hairy vetch can be terminated in the following spring as a green manure, or harvested for seed at maturity
- Harvested hairy vetch seed can be used for future oat-hairy vetch intercropping, reducing otherwise expensive seeding costs
- Year 2 hairy vetch could also be silage or hayed and fed as a high-value supplement

A disadvantage is that hairy vetch has a high amount of hard seed, resulting in sporadic germination in subsequent years. Some reports show problems for ruminants fed hairy vetch seed (although some show that the risk is minimal). The crop is also resistant against glyphosate, which can cause problems for some rotations.

Agronomic info

Previous 2 years crop	Summer fallow (2016); Pea-oat cover crop (2017)
Soil Type	Erickson Loam Clay
Landscape	Rolling with trees to the west
Seedbed preparation	Tilled and sprayed

Materials and Methods

Seeding	Jun 12
Harvest	Sept 20

Table 2: Spring 2018 Soil Test

	Available
N	150 lb/ac
P	23 ppm
K	181 ppm

Added Fertility

10lbs/ac actual P and 2.11lbs/ac actual N

Tamarack Farms Pea-Quinoa Intercrop

Project duration May 2018 – August 2019
Objectives To demonstrate the use of cover cropping strategies
Collaborators Ryan Pengelly, Tamarack Farms

Results
Due to extreme insect pressure, the quinoa crop did not yield any seed. However, the intercropped peas established well and yielded seed.

Project findings
Both the quinoa and the pea crops established successfully. Unfortunately, the quinoa sustained extreme insect damage (stem borer and goosefoot groundling moth) and so it did not yield any seed. Despite the virtual failure of the quinoa crop, the accompanying pea crop performed well. The peas were seeded at varying rates, and yields varied accordingly. The success of the pea crop, despite the failure of the quinoa crop, demonstrates the potential for intercropping to reduce risk to the producer within the cropping year.

Background/References/Additional Resources
The trial was designed to examine yield differences between pea and quinoa crops seeded at combinations of high, medium and low rates for both crops. Proposed benefits of intercropping include: 1) confusion of insect populations; 2) beneficial nutrient interactions such as nitrogen fixation; 3) support for crops prone to lodging; 4) increased combined yields; 5) mitigation of the risk of crop failure; 6) weed suppression; and 7) reduced input requirements and costs.

Materials & Methods

Experimental Design	Random Complete Block Design
Entries	11
Seeding	May 24
Harvest	Sept 5

Agronomic info

Previous 2 years crop	Oat Barley Silage
Soil Type	Erickson Loam Clay
Landscape	Rolling with trees to the east
Seedbed preparation	No-till due to moisture concerns; direct-seeded into stubble

Table 1: Spring 2018 Soil Test

	Available
N	54 lb/ac
P	13 ppm
K	228 ppm
S	118 lb/ac

Added Fertility: 10lbs/ac actual P and 2.11lbs/ac actual N

Table 2: Treatments – Seeding Rate

Pea only	High pea, high quinoa	Medium pea, high quinoa	Low pea, high quinoa
	High pea, medium quinoa	Medium pea, medium quinoa	Low pea, medium quinoa
	High pea, low quinoa	Medium pea, low quinoa	Low pea, low quinoa
			Quinoa only

Data collected	**Date Collected**
Vigor	June 25

Tamarack Farms Quinoa Cover Crop

Project duration May 2018 – August 2019
Objectives To demonstrate the use of cover cropping strategies
Collaborators Ryan Pengelly, Tamarack Farms

Results
Due to extreme insect pressure, the quinoa crop did not yield any seed. However, the intercropped cover crops established successfully and will be evaluated for overwinter survival, biomass and seed yield in Year 2

Project findings
Emergence and crop establishment for both the quinoa and the pea crop were successful. Unfortunately, the quinoa sustained extreme insect (stem borer and goosefoot groundling moth) damage, resulting in poor crop development and minimal seed yield. Despite the virtual failure of the quinoa crop, the accompanying cover crops performed well, demonstrating the potential for intercropping to reduce risk to the producer within the cropping year.

Background/References/Additional Resources
Cover cropping as a part soil management is of growing interest to many Manitoba farmers. Cover crops perform a number of significant functions for the soil, including but not limited to: controlling soil erosion after harvest of the cash crop; increasing soil nutrients; and, improving water infiltration.

Materials & Methods

Experimental Design	Random Complete Block Design
Entries	11
Seeding	June 13
Harvest	No quinoa harvest; cover crop biomass harvest planned for 2019

Table 1: Understory Crops

Persian Clover	Subterranean Clover	Italian Ryegrass	Alfalfa
White Clover	Alsike Clover	Fall Rye	Quinoa only
Red Clover	Yellow Sweet Clover	Cicer Milk Vetch	

Data collected	**Date Collected**
Vigor	June 25

Agronomic info

Previous 2 years crop	Oat Barley Silage
Soil Type	Erickson Loam Clay
Landscape	Rolling with trees to the east
Seedbed preparation	No-till due to moisture concerns; direct-seeded into stubble

Table 2: Spring 2018 Soil Test

	Available
N	54 lb/ac
P	13 ppm
K	228 ppm
S	118 lb/ac

Added Fertility
10lbs/ac actual P and 2.11lbs/ac actual N

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