Mackenzie Applied Research Association

2008 Annual Report

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Mackenzie Applied Research Association

The Mackenzie Applied Research Association is a non-profit, producer-driven organization that conducts applied agricultural research, demonstration trials and rural extension in Mackenzie County.

Our Mission

To serve producers within Mackenzie County by meeting the special needs that result from our unique climatic, geographic and soil conditions and to facilitate the transfer of best management practices to producers on reducing production costs, marketing strategies, alternative practices and environmental sustainability.

2008 Staff

Usman Mufti
Research Coordinator
October-June

Melissa Driedger
Assistant Research Technician
Administrator

Ben Peters
Field Laborer
June-September

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Raymond Dyck
Phone: 928-2382

ACKNOWLEDGEMENTS

We appreciate the contribution of local producers, municipal, provincial and federal governments as well as local and regional business. The success of our research program depends on the dedication of numerous individuals contributing their expertise, time, land and equipment to assist our association in achieving its research and extension goals.

LOCAL COOPERATORS

Frank Bueckert

MACKENZIE COUNTY

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Agricultural Fieldman, Grant Smith

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Kevin Falk
Rob Graf
Lance Lewis
John O' Donovan
Joe Unruh
Randy Friesen

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CIAM RADIO

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Phil Peters
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James Neufeld

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Dan Benson (Conservation Technician)
Gary Telford (Soil Resource Specialist)

NATURAL RESOURCES CONSERVATION BOARD

Doug Beddome
Vince Murray

OTHER INDUSTRY GROUPS

Alberta Barley Commission (ABP)
Alberta Pulse Growers Commission (APGC)
Alberta Natural Health Agriculture Network (ANHAN)
Canadian Cattleman's Association (CCA)
Canola Agronomic Research Program (CARP)
Canadian Agricultural Safety Association (CASA)

AGRI-BUSINESS, CORPORATE SPONSORS AND LOCAL INDUSTRY

Geological Survey of Canada

AGRICULUTURAL RESEARCH AND EXTENSION COUNCIL OF ALBERTA (ARECA)

Dee Ann Benard
Gayah Sieusahai
Joy Vonk

Battle River Research Group (BRRG) — Alvin Eyolfson & Jenifer Heyden
Grey Wooded Forage Association (GWFA) — Albert Kuipers
Lakeland Agricultural Research Association (LARA) — Meghan Ford & Debra Lozinski
North Peace Applied Research Association (NPARA) — Nora Paulovich & late Andrea Vavrek
Peace Country Beef and Forage Association (PCBFA) — Amber Havens & Jaime Borduzak
Smoky Applied Research and Demonstration (SARDA) —Vance Yaremco, Tara Lea, Brianne Brault & Jean Beaudoin
West Central Forage Association (WCFA) — Doug Panzer

ALBERTA ENVIRONMENTALLY SUSTAINABLE AGRICULTURE (AESA)

Dale Chrapko Randy Perkins
John Zylstra

CANOLA COUNCIL OF CANADA

Raymond Gadoua

Agricultural Research and Extension Council of Alberta (ARECA)

Vision
ARECA is a provincial association of non-profit producer groups dedicated to enhancing the sustainability and profitability of agriculture in Alberta.

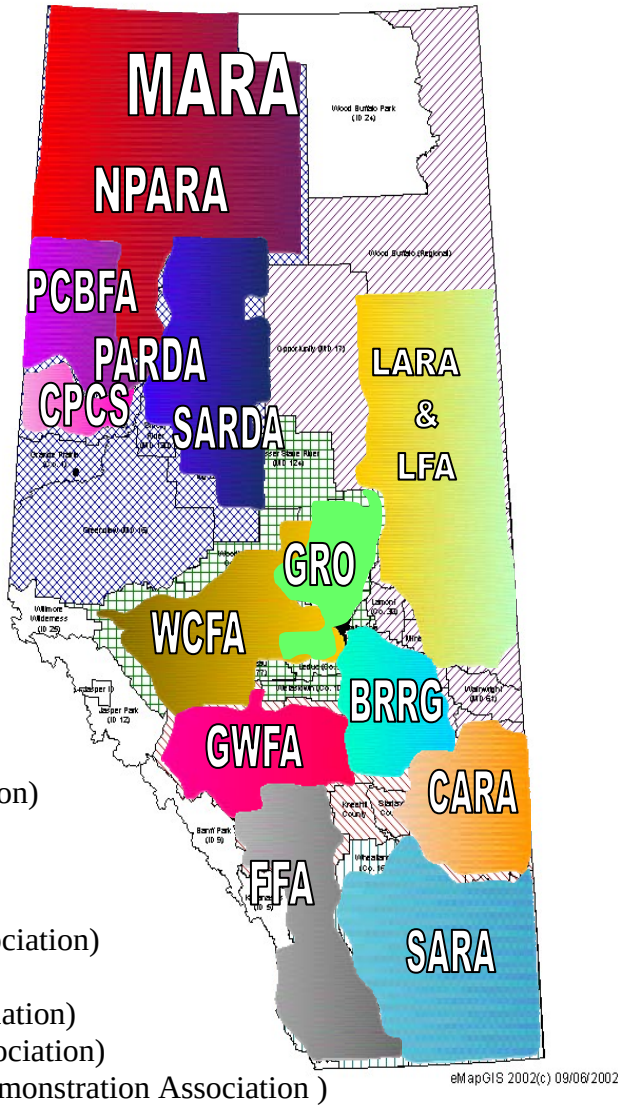
Mission
- Represent members on a provincial level.
- Coordinate resources and activities.
- Enhance communication and extension between producers, researchers, industry and government
- Facilitate efficient growth of agriculture communities in Alberta.

Dee Ann Benard, Executive Director

Joy Vonk, Executive Assistant

Gayah Sieusahai, Crop Program Manager

Grant Lastiwka, Forage Program Manager



BRRG (Battle River Research Group)
CPCS (Central Peace Conservation Society)
CARA (Chinook Applied Research Association)
FFA (Foothill Forage Association)
GRO (Gateway Research Organization)
GWFA (Grey Wooded Forage Association)
LARA (Lakeland Agricultural Research Association)
LFA (Lakeland Forage Association)
MARA (Mackenzie Applied Research Association)
NPARA (North Peace Applied Research Association)
PARDA (Peace Agriculture Research and Demonstration Association)
PCBFA (Peace Country Beef and Forage Association)
SARDA (Smoky Applied Research and Demonstration)
SARA (Southern Applied Research Association)
WCFA (West Central Forage Association)

Presidents Report

By: John Simpson

2008 was a very challenging year for MARA. We started with high hopes for good projects but in June realized we had serious problems and released our manager. Many of the originally planned projects were not completed. On the bright side our Regional Variety Trials did look good this past year and are written up later in this annual report. MARA is like our farms, if we don't produce we don't have income. Fortunately we do have reserves to cover ourselves for this year. We have hired a new Research Coordinator.
We have a number of research projects to do such as:

1. A on farm dugout water quality test
2. Field runoff to undisturbed natural flora runoff test
3. Wormwood weed control trial
4. Pea seed depth and stand ability trial
5. Manure odor and nutrient management trial
6. Some RVT trials

MARA does need your membership and support to continue. We go for funding and other groups are serving a far larger agricultural base with many more members. We look small and insignificant. Help MARA by being a member and contributing good research ideas and thoughts to our manager so that what we are doing is relevant to you and farmers in the rest of the province. That will help insure MARA's survival and relevance into the future.
Thank you in advance for your support for MARA

Sincerely;
John Simpson
(MARA President)

Regional Variety Trials: Cereals and Flax

Funded by ARECA RVT Program and the Alberta Barley Commission

Take Home Message

Increases in field crop yields are a combination of improved agronomic practices and advances in variety development. Data reported in this publication will help producers compare new varieties with widely grown cultivars in their area. One of the main purposes of plant breeding and testing programs is to increase yield potential of a variety. Through the development of new varieties resistance to disease and insects are also improved.

When choosing a crop variety it is beneficial to observe data from field trials in your particular area. Keep in mind that varieties that perform satisfactory under adverse conditions may perform better in optimum growing conditions. If more information is required on a particular variety the Mackenzie Applied Research Association is available to provide assistance.

Background

The Regional Variety Trials are conducted throughout Alberta and British Columbia. Each site is subject to different soil and climate conditions, therefore, the data is useful to local producers. The data is collected by ARECA and compiled for print in seed.ab.ca. MARA has been involved with the Regional Variety Trials since 1995.

Objectives

- To collect agronomic data on yield, disease presence, insect populations, plant height, lodging, maturity, and seed size of newly registered and established varieties of cereals and oil seeds.
- To publish the data for use by local producers.
- To familiarize producers with the varieties available.

Materials and Methods

The 2008 Regional Variety Trials consisted of 9 lines of 6-row barley, 17 lines of 2-row barley, 5 lines of flax, 9 lines of oats, 6 lines of utility wheat, 18 lines of hard red spring

wheat, 4 lines of triticale, .

For each crop, the seeding rate was determined from the 1000 kernel weight of each variety. In this way, the number of seed for each entry is almost the same. All seed was treated —cereal and flax seeds with Raxil and canola seeds were treated with Helix. Plots were planted at 6.5 meters in length with four rows 12 inches apart. Harvest area was 5 meters long by 1.22 meters wide. Seeding depth for cereals varied from 1—1.5 inches depending on soil texture and moisture conditions. The seeding depth for canola and flax ranged between 1/4—1/2 inch.

A fertilizer mix of 26-15-5-5 was banded at a rate of 200 lbs/acre. Table 1 summarizes the crop management details.

Table 1: 2008 Variety Trial Management Information

Crop	Seeding Date	Harvest Date	Previous Crop	Fertilizer NPKS (lb/ac)	Herbicide	Application Rate/Acre
Oats	May 14	August 27	Wheat	26-15-5-5 200 lbs/ac	Buctril M	400 ml
Wheat	May 14	August 27	Wheat	26-15-5-5 200 lbs/ac	Buctril M	400ml
Barley	May 14	August 26	Oats	26-15-5-5 200 lbs/ac	Buctril M	400 ml
Triticale	May 14	September 11	Triticale	26-15-5-5 200 lbs/ac	Buctril M	400 ml
Canola	May 16	September 8	Canola	26-15-5-5 200 lbs/ac	Post Ultra + Mustard + Lontrel	190 ml + 8g/acre + 400 ml
Flax	May 16	September 19	Canola	26-15-5-5 200 lbs/ac	Post Ultra	190ml + 400ml

Cereal trials were replicated three times and flax and canola were replicated four times in a randomized complete block design. After plants were established, all plots were cut back to five meters in length by roto-tillage to ensured equal length of harvest. Throughout the growing season, field notes were recorded on maturity rates, height, disease or insect presence and lodging.

Lodging was determined for all varieties as a percentage of area affected. Plots were scored from 1 to 10, with 1 being equal to <10% of plants lodged and 10 representing 100% of the plants as lodged.

A 125-C Hege plot harvester was used to collect the mature seed for all the trials. Samples were sent through a Clipper seed cleaner and then evaluated for field yield, test weights and 1000 kernel weights. Due to poor initial setup we experienced a poor flax trial.

Results and Discussions

The 2008 growing season was predominantly with steady rainfall amounts. This influenced good growing conditions and therefore, establishment of all the trials. Throughout the growing season all the trials did not show any insect, disease, and lodging problems.

The following 2 - 10 tables summarize the data obtained in the year 2008 growing season.

Table 1: 2008 Fort Vermilion Agronomic Data—2 Row Barley

Name	Anthesis (days)	Maturity (days)	Height (cm)	Lodge	Yield (bu/ acres)	KWT 1000 (g)	KGHL (g/1000)
TR05915	188.3	219.7	81	1	134	49.1	62
CDC MINDON	187.3	220.7	79.3	1	118.2	54.7	62
MERIT 16	188.7	224.7	81.7	1	137.7	51.8	63.7
AC METCALFE	188.7	222	83	1.3	136.3	53.4	63
TR05104	189.3	224	81.7	1.7	147.3	54.1	62.7
PONOKA	188.3	233.7	87.7	1.3	143	53.3	64.3
TR05912	187	222.3	84	2	151.3	50.7	64.3
CDC COALITION	188.3	222.7	77.7	1	150.9	54.1	63
TR06673	186.7	221	87	1.7	136.1	59	64.7
CDC COWBOY	188.7	223.7	110	1	125	63	63
TR05671	187.3	223.3	90	1	151.8	56.9	62.7
TR05669	186	222.3	90	1	158.5	54.3	63
TR05102	187	224.7	86.3	1	146.8	55	64
XENA	188	222.7	80.3	1.3	156.7	53.5	63.3
MERIT 57	188	226.7	84.3	1	157.6	51.9	63
CHAMPION	186	221.3	83.7	2	154.7	53.5	63
TR06389	189	223	84	1	163.6	54	64

Table 2: 2008 Fort Vermilion Agronomic Data—6 Row Barley

Name	Anthesis (days)	Maturity (days)	Height (cm)	Yield (bu/ acres)	KWT 1000 (g)	KGHL (g/1000)
SR 410	186.6	220.3	83	134.9	47.4	60.3
SR 412	186	220	84	122.7	52	61
STELLAR-ND	186	219.3	84.7	123.9	50.4	62.7
AC MET-CALFE	189.3	220.7	85.3	136.2	57.5	66.3
ALSTON	185.7	219.7	80.7	138.2	53.6	61.3
BT577	187	219.7	86.7	131	48.8	61.7
BT980	186.3	219	89	121.7	48.3	62
VIVAR	187	220	76.3	141.2	52.3	62.3
CDC CLYDE	185.3	218	80.3	129.4	47.4	60

Table 3: 2008 Fort Vermilion Agronomic Data—Utility Wheat

Name	Anthesis (days)	Maturity (days)	Height (cm)	Yield (bu/ acres)	KWT 1000	KGHL (g/1000)
AC CRYSTAL	188	231.3	79.3	77.7	50.8	74.4
AC SADASH	187.3	231.3	87.3	98.6	47.72	74.7
5702PR	187	231.3	82.3	67.8	52.5	71.9
AC TABER	189	232.3	106.3	83	49.7	74.72
AC MEENA	195.3	235.6	87.3	91.5	39	73.6
AC ANDREW	188.7	233.7	82	93.7	44.11	73.6

Table 4: 2008 Fort Vermilion Agronomic Data—Hard Red Spring Wheat

Name	Anthesis (days)	Maturity (days)	Height (cm)	Lodge	Yield (bu/ acres)	KWT 1000 (g)	KGHL (g/1000)
WASKADA	183.3	227	84.3	1	57.7	45.5	78
LILLIAN	185	226.3	80.7	1.7	57.9	39.1	75
BW388	185	227.7	90.3	1	71.2	40.5	76.3
SOMERSET	185.7	228.7	94.3	1.3	65.2	40.2	73
KATEPWA	184	227.7	91	2	57.7	39.1	75
SNOWSTAR	183	228	81.7	1.3	61.6	38.8	76.7
BW859	184.3	228	86.7	1.3	69.6	42.3	76.7
UNITY	183.3	227.3	90.7	1.3	64.6	42.3	75
BW365	183.3	227.7	91	2	66.7	38	77.3
AC BARRIE	184.3	228.3	85.3	1	60.9	40.2	75.3
ALVENA	182.3	227	89.3	1.3	60	41	75
CDC ABOUND	184.3	228	77.7	1.3	64.6	48.6	807
CDC ALSASK	185.3	227.7	95.7	1.3	69.9	41.1	75.7
BW867	185.7	227.3	76.7	1	66.1	45.6	76.7
KANE	183	227.3	84	1	53.9	42.7	78.3
5602HR	184.7	227	89	1	62.3	44.9	77.3
GOODEVE	184.7	227	88.7	1.3	60.3	43.2	74.7
AC SUPERB	184.3	227	837.1	1	70.6	48.5	78

Table 5: 2008 Fort Vermilion Agronomic Data—Triticale

Name	Anthesis (days)	Maturity (days)	Height (cm)	Yield (bu/ acres)	KWT 1000 (g)	KGHL (g/1000)
TYNDAL	188.3	233.7	111.7	112.8	48.8	68.15
BUNKER	187.7	232	118.3	102.5	53.12	68.5
AC ULTIMA	187	231.7	103	111.3	47.7	63
PRONG-HORN	187.7	233.3	110.7	109.9	47.9	67

Table 6: 2008 Fort Vermilion Agronomic Data—Oats

Name	Anthesis (days)	Maturity (days)	Height (cm)	Lodge	Yield (bu/ acres)	KWT 1000 (g)	KGHL (g/100 0)
CDC PROFI	184.6	222.3	90.3	1	152.4	53.2	47.6
CDC DANCER	185	223	102.6	2	149.7	51.2	51
CASCADE	185.3	224	110	4	171.1	50	50.3
OT 576	187.3	227.3	103.3	2	191.4	54.1	49.6
JORDAN	188.3	228.3	99.3	3	182.5	58.2	48.6
CDC MINSTREL	185	226	100.6	1	158	52.2	50.3
MURPHY	186.6	225.3	113.3	3	170.7	45.7	50
TRIACTOR	185.3	225	102	2	190.2	53.3	47.6
SW BETANIA	185	224.6	101	3	148.1	51.5	48

Table 7: 2008 Fort Vermilion Agronomic Data—Flax

Name	Maturity (days)	Yield (bu/acres)	Height (cm)
PRAIRIE THUNDER	237.7	39.2	68.8
PRAIRIE GRANDE	236.5	42.7	86.3
CDC SORREL	237.8	35.5	78.6
NORLIN	242.5	35.4	76.5
CDC BETHUNE	236.3	41.2	88.5

Prairie Canola Variety Trials: Fort Vermilion

Funded by the Canola Commission of Canada

Take Home Message

MARA has grown the Prairie Canola Variety Trials (PCVT) since 2004, although the trials were established on the Experimental farm at Fort Vermilion during 2005 with Agriculture and Agri-Food Canada. In 2008 thirty-four cultivars of Argentine canola were evaluated. Field observations revealed good establishment of most plots.

Background

The year 2003 marked the launch of a canola variety testing program called the Prairie Canola Variety Trials (PCVT). This testing system replaces provincial canola variety testing programs and will help standardized protocols and improve trial consistency and quality. The canola seed industry, Alberta Agriculture Food and Rural Development, Saskatchewan Agriculture Food and Rural Revitalization, Manitoba Agriculture and Food (in-kind contribution), provincial canola commissions and the Canola Council of Canola each contribute to PCVT. Trials were conducted by seed companies, government researchers and independent contractors in three growing zones across the prairie: short season, mid season and long season. Two replicated tests were conducted at each site to group together varieties with similar maturity and to ensure that valid statistical comparison could be made between varieties.

The PCVT Trials are grown in three major maturity zone: short (roughly corresponds to Alberta agro climatic area 4, 5 and 6), mid (area 2 and 3) and long (area 1). The Canola Digest prints location specific results in December and the data is posted on the Canola Council website. A summery is also published by Alberta Agriculture. Yield columns shows the actual yield of the check while other variety yields are relative to the check. The varieties were divided into two sets; PCVT 1 includes varieties that are slightly earlier in maturity, while PCVT 2 cultivars are later. Although variety trials are carefully conducted, small percentage differences in yield are usually meaningless

Objectives

- To collect agronomic data on Argentine canola at the Fort Vermilion site.
- To publish the data for use by local producers

Materials and methods

The 2008 Prairie Canola Variety Trials consisted of 17 lines of argentine canola NS 1, and 17 lines of argentine canola NS 2. A randomized complete block design with four replicates was used. Each plot was seeded and to 6.5 m by 4-row plot seeder with 12-inch row spacing. Throughout the growing season, field notes observing or measuring the maturity lodging and height were recorded

Table 1 2008 Fort Vermilion Agronomic Data—Canola PNS 1

Name	1st Flower	Days to Mature	Lodging	Yield (bu/ acres)
71-30 CL	182.75	227	2.5	64.9
8440	183	243.25	1.25	69
43H57	182.25	225.75	1.75	57.8
45H28	182.5	230.75	1.25	61.6
9553	182.5	228.75	1.5	64.9
5020	182.5	228.5	1.5	63.7
71-45 RR	182.75	225.75	2	53.7
45H73	182.75	227.25	1	57.3
9590	182	227.25	1.25	59
45H26	183.75	227	1.25	55.6
45H21	182.25	228.5	1.5	59.4
06RHY/953	182	226.5	1.25	61.5
46A65	182.5	228	1	56.8
43E01_	182.25	225.75	1.75	57
Café	181.75	225	1.25	55
1143	182.5	228.25	1.25	64.1
9554	182.25	225.5	1.25	47.1

Table 2: 2008 Fort Vermilion Agronomic Data—Canola PNS 2

Name	First Flower	Days to Mature	Lodging	Yield (bu/ acres)
SW K5325 RR	182.75	228.75	1.25	66
D3150	182.5	228.25	1.5	66
5030	181.75	226.25	1	70.4
SP 761	182.75	230.5	1.5	66.5
46P50	183	233	1.75	72.3
5440	182.5	229.75	1	80.6
5020	182	228.75	1.25	75.1
997RR	182	228.5	1.75	64.5
Rugby	182.25	228	1.75	60.8
45P70	182.25	227.25	1.75	66.6
H4414 RR	181.75	227.75	1.5	68.8
H6235	136.75	230	1.75	70.8
PHS06-944	182.75	231	1.5	75.5
v1037	182.25	226.75	1.25	64.3
H6051	182.25	229.5	2	65.2
D3151	182	227	1.25	62.2
45H21	182.25	226.75	2	67.5

Brown Bag vs. Certified Canola Seed Trial

A producer in the region wondered how big a return certified canola seed returns over brown bagged seed. Brown bagged seed was seeded beside certified 5020 and certified 5180 in 70ft strips by 1 mile long. All plots were seeded May 12, 2008 and fertilized with 260# of 31-10-2-8. on unworked wheat stubble with gen 300 paired row openers on a John Deere 665 airseeder equipped with on row packing. The certified seed was treated with prosper and seeded at the rate of 5 pounds per acre. The brown bagged seed was untreated and seeded at the rate of 10 pounds per acre. Moisture conditions were good. The brown bagged seed received some flea beetle damage upon emergence. The plots were sprayed with an appropriate herbicide on June 10th. Mixed with the herbicide was seven though the flea beetles seemed to have disappeared. The plots were sprayed for sclerotinia control with rovral in early July. All plots were swathed the same day though the 5108 was very slightly more mature but still well within swathing parameters. The swaths were combined Sept. 10th. The brown bagged canola yielded 11460 pounds on two swather widths of 23ft which works out to 40.9 bushels/acre. The certified 5108 yielded 12200 pounds which works out to 43.6 bushels/acre.

There was an error made on weighing the certified 5020. These samples all graded 1cc. The certified 5020 had 2.5% dockage; the brown bagged had 2.6% dockage and the 5108 1.6% dockage.

The seed samples were sent out to a lab for analysis. It appears that brown bagged seed has about 2% less in oil and 2% higher in protein than the certified seed. The glucosinates in the brown bagged was between the other two, but the chloroform was somewhat higher but not high enough to affect grading.

		NIR	NIR	NIR	NIR	NIR	NIR	NIR	NIR	NIR	NIR	NIR	NIR	NIR
						Total Seed	**Total Seed**							
NIR	Sample Number	**Oil**	**Oil**	**Protein**	**Protein**	**Oil Free**	**Chloro.**	**Gluc.**	**Gluc.**	**Oleic**	**Lino-lenic**	**Satu-rated**	**Iodine**	**Moist**
Posi-tion		**8.5mb**	**%db**	**8.5mb**	**%db**	**Protien**	**as is**	**mole/g**	**mole/g**	**Acid**	**Acid**	**Fat**	**Value**	**%**
						%d.b.	**ppm**	**8.5mb**	**%db**	**%**	**%**	**%**		
1	Cert 5020 1cc 2.5% dock	45.69	49.93	18.26	19.95	39.85	6.74	7.22	7.89	63.4	9.11	6.86	111.63	5.54
2	BB 2 miles 11460 1cc 2.6% dock	43.25	47.27	21.37	23.35	44.28	10.59	8.89	9.27	62.09	8.77	7.04	112.25	5.49
3	Cert 5108 12200 1cc 1.6% dock	45.03	49.21	19.78	21.62	42.57	7.26	9.24	10.1	63.48	9.01	6.79	111.88	5.31
	mean	**44.66**	**48.81**	**19.8**	**21.64**	**42.23**	**8.2**	**8.45**	**9.24**	**62.99**	**8.97**	**6.9**	**111.92**	**5.45**
	st dev	**1.26**	**1.38**	**1.56**	**1.7**	**2.24**	**2.09**	**1.08**	**1.18**	**0.78**	**0.17**	**0.13**	**0.31**	**0.12**
	max	**43.25**	**47.27**	**18.26**	**19.95**	**39.85**	**6.74**	**7.22**	**7.89**	**62.09**	**8.77**	**6.79**	**111.63**	**5.31**
	min	**45.69**	**49.93**	**21.37**	**23.35**	**44.28**	**10.59**	**9.24**	**10.1**	**63.48**	**9.11**	**7.04**	**112.25**	**5.54**
	n	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**

Alberta Pest Survey

Funded by the Agriculture Opportunity Fund through ARECA

Take Home Message

The survey is conducted province wide and are intended to provide local and timely information on insect numbers and distribution to producers for management decisions. It is important for producers to scout their fields on a regular basis and practice insect identification. Understanding economic thresholds so that applications of insecticides are reduced or eliminated will be beneficial to producer's bottom line and the environment.

Diamondback Moth Survey

This moth does not survive over winter in Canada but migrates in on southerly winds in May and June. Females lay eggs on the upper surface of leaves. Larvae hatch and "mine" the leaves. Older larvae eat the under surface of the leaf. Larvae are pale green and actively wriggle when they drop from a leaf on a silken thread when disturbed. Diamondback are mainly found in canola and mustard fields.

The traps for Diamondback moths resemble small white houses with a pheromone hanging inside. As the moths are attracted to the traps, they become stuck to the adhesive floor. MARA also monitored traps containing two different types of Diamondback moth pheromones. In general, few moths were caught in traps around the Fort Vermilion area in 2008.

Organic Product comparison trial

Funded by the Alberta Organic Producers Association (AOPA)

Abstract

The Alberta Organic Producers Association contracted Gateway Research Association (GRO), MacKenzie Applied Research Association (MARA) and the Battle River Research Group (BRRG) to conduct product comparisons of certified organic products. An independent evaluation of products is valuable to evaluate potential benefits or yield increases. Evaluations were carried out on organic oats and barley in certified organic fields near Westlock, Fort Vermillion and New Norway, Alberta.

No Significant increases in yield were noted by treatment at either location.
The coefficient of variability for crop was high at the New Norway Location, this may have been due to uneven weed pressure. Yields of both barley and oats were poor at New Norway. Barley yields only averaged 22 bu/acre. Average yields for Oats were 26 bu/acre

Yields were considerably higher at the Fort Vermillion and Westlock locations. At Westlock barley and oats yielded 66 and 120 bushels/acre respectively. Fort Vermillion yields were similar with yield of 68 bushels/acre (barley) and 84 bushels/acre (oats). There was no significant difference in yields between treatments at these locations.

Methods

All equipment used for seeding, application of products, maintenance or harvesting was cleaned before entering the organic status fields.
Certified Organic seed was supplied by the Alberta Organic growers. AC Seebe barley with a germination of 99% and a 1000 kernel weight of 53 grams was used. The barley was sown at 22 plants/sq foot. Derby Oats had a 1000 kernel weight of 38 grams with 99% germination. The oats were sown at 24 plants/sq foot.

General plot information is below.

	New Norway	Fort Vermillion	Westlock
Co-operator	Steven Snider	Frank Bueckert	Emil Lambert
Location	NW 12-45-20 w of 4	SE-13-108-13-W5	NW 34-58-27 W4
Previous crop		Peas	Barley
Cultivation	Fall, two weeks before and one day before seeding	One day before seeding	Rod weeded in spring
Seeding date	June 5	June 3	June 4
Seeding Equipment	Fabro plot drill -6 row by 9 inch spacing	Fabro press drill -8 row by 8 inch spacing	Fabro plot drill -8 row by 8 inch spacing
Application equipment	4 nozzle C02 pressurized hand boom	Hand sprayer	4 nozzle C02 pressurized hand boom
Harvest date	September 26	October 3	October 3

Products used

Treatments:

Check – no additions

Grow calcium (Ca) and Dormant Ca – Dormant was added to soil before seeding. Grow Ca was added just after seeding, before the crop emerges. Both products used15 gallons/acre water and were sprayed directly onto the soil. Rates: Dormant Ca = 45g/acre; Grow Ca = 45 g/acre

Grow Ca only

N-Fix applied with the seed

Agrotek 10:3:3 formulation applied at 20 Kg/ha, cost is $52/acre

Organic Gem – fish emulsion – Rates = 1 ½ gal/acre pre-emergent application and 1 ½ gal/acre foliar application at flag leaf stage. 5.7 L/acre

Total Nourish – a blood/bone/feather meal – applied to seed at .23 grams/sq ft, 3:1:2 formulation, applied at 10 kg/acre cost is $52/acre

Full meal deal – Grow Ca, Dormant Ca, and Organic Gem

Figure 1: New Norway plot at harvest

Comments on application

Organic gem fish emulsion needs course nozzles and screens, otherwise plugging may occur. This emulsion had a strong odour as well.

Yield, seed size and bushel weight information can be found on the following pages. Tables 1 and 2 are for New Norway. Tables 3 and 4 are for Fort Vermillion. Tables 5 and 6 are for West-lock.

Results

Table 1: Barley yields, TKW, and bushel weights – New Norway

#	Treatment	Bu/acre	Dockage per cent	TKW	Bushel weight
5	Total Nourish	24 a	2.1 a	39.8 a	52.4 a
6	Full Meal Deal*	24 a	3.3 a	43.4 a	51.5 a
3	Grow Ca	23 a	2.3 a	41.4 a	52.1a
4	Organic Gem	22 a	3.4 a	38.1a	51.8 a
1	Untreated	21 a	3.4 a	42.1 a	51.9 a
2	Grow +Dormant Ca	19 a	2.7 a	38.6 a	51.9 a
	Mean	22.1	2.9	40.5	51.9
	LSD (P=.05)	**NSD**	**NSD**	**NSD**	**NSD**
	CV	**18 %**	**52%**	**11%**	**2.7%**

There were no significant differences in yields between treatments in Barley at New Norway. Weed dockage had a high CV (coefficient of variation) illustrating an uneven weed stand. This may have influenced yields. CV values should generally be lower than 15%.

Table 2: Oat yields, TKW, and bushel weights – New Norway

#	Treatment	Bu/acre	Dockage per cent	TKW	Bushel weight
3	Grow Ca	30 a	5.7 a	30.1	41.4 a
1	Untreated	28 a	5.3 a	29.5	41.8 a
2	Grow +Dormant Ca	27 a	6.4 a	31.8	41.5 a
4	Organic Gem	25 a	7.4 a	31.8	40.6 a
5	Total Nourish	24 a	5.2 a	33.2	40.5 a
6	Full Meal Deal	24 a	6.0 a	32.7	41.1 a
	Mean	26.3	6.0	31.5	41.2
	LSD (P=.05)	**NSD**	**NSD**	**NSD**	**NSD**
	CV	**16.3%**	**27.9 %**	**11.2 %**	**2.8%**

There were no significant differences in yields between treatments in oats at New Norway. Dockage was variable, showing that the weed infestation was not uniform. This variation in competition may explain why there was little treatment effect

Moisture patterns were different with a lack of July and August rainfall limiting yields at New Norway.

Table 3: Barley yields, TKW, and bushel weights – Fort Vermillion

#	Treatment	Bu/acre	Dockage per cent	TKW	Bushel weight
2	Grow +Dormant Ca	75 a		54.9 a	46.5 a
5	Total Nourish	72 a		51.5 a	41 a
3	Grow Ca	71 a		52.8 a	46.8 a
4	Organic Gem	70 a		55.2 a	46.8 a
1	Untreated	64 a		52.1 a	46 a
6	Full Meal Deal*	58 a		52.5 a	46.5 a
	Mean	68			
	LSD (P=.05)	**15-NSD**		**7.5 - NSD**	**7.7 -NSD**
	CV	**14.5 %**		**9.3%**	**11.2 %**

There were no significant differences in yields between treatments in Barley at Fort Vermillion.

Table 4: Oat yields, TKW, and bushel weights – Fort Vermillion

#	Treatment	Bu/acre	Dockage per cent	TKW	Bushel weight
1	Untreated	89 a		43.2 a	38.5 a
6	Full Meal Deal	88 a		45.1 a	37.5 a
2	Grow +Dormant Ca	86 a		47.0 a	37.3 a
4	Organic Gem	84 a		47.7 a	38.3 a
3	Grow Ca	82 a		43.0 a	37.5 a
5	Total Nourish	81 a		46.1 a	37.5 a
	Mean				
	LSD (P=.05)	**18-NSD**		**4.3 -NSD**	**1.6 - NSD**
	CV	**14 %**		**6.4 %**	**2.8%**

There were no significant differences in yields between treatments in oats at Fort Vermillion.

Table 5: Barley yields, TKW, and bushel weights - Westlock

#	Treatment	Bu/acre	TKW	Bushel weight
8	Full Meal Deal*	71 a	44 ab	50.5 a
7	Total Nourish	70 a	44 ab	50.4 a
6	Organic Gem	69 a	43.6 ab	50.8 a
1	Untreated	68 a	44.5 ab	50.5 a
5	Agrotek	65 a	45.6 a	51 a
2	Grow +Dormant Ca	65 a	41.5 b	50.7 a
3	Grow Ca	64 a	44.1 ab	50.5 a
4	N-Fix	58 a	42.5 ab	50.7 a
	Mean	**66.11**	**43.7**	**50.6**
	LSD (P=.05)	**NSD**	**2.1**	**NSD**
	CV	**13.5 %**	**3.3 %**	**0.9%**

Barley yields were much higher at Westlock than at New Norway.
There were no significant differences in yields between treatments.

Table 6: Oat yields, TKW, and bushel weights – Westlock

#	Treatment	Bu/acre	TKW	Bushel weight
3	Grow Ca	118 a	34 a	38.8 a
6	Organic Gem	117 a	34.4 a	39 a
8	Full Meal Deal*	117 a	33.3 a	39.3 a
1	Untreated	117 a	32.5 a	38 a
5	Agrotek	116 a	32.6 a	38.3 a
4	N-Fix	111 a	33 a	39 a
7	Total Nourish	108 a	31.5 a	37.5 a
2	Grow +Dormant Ca	105 a	32.8 a	39 a
	Mean	**120.6**	**33**	**38.5**
	LSD (P=.05)	**NSD**	**NSD**	**NSD**
	CV	**7.5 %**	**7.1%**	**3 %**

Oat yields were also higher at Westlock than at Killam. Any yield differences noted in the treatments are not statistically different. No conclusions can be drawn.

Table 5: April to August precipitation.

	Busby	Ferintosh	Fort Ver-milion
April	34.6	32.4	14.0
May	53.5	40.8	27.3
June	15.2	80.9	51.4
July	56.1	51.3	55.1
August	25.8	54.5	12.3
Total mm	185	259.9	160
Total Inches	7.7	10.8	6.6

Summer precipitation was similar for most months at weather stations near to the project locations. June precipitation was higher at Ferintosh.

Busby - 5 kms from Westlock site
Ferintosh - 20 km's southwest of New Norway project site.

Discussion

Average yields were considerably higher at the Westlock and Fort Vermillion locations than at New Norway (Tables 1 through 6). Precipitation levels were similar at Westlock and New Norway locations (Table 5). Seeding dates were also similar.

The New Norway had more tillage passes than the Westlock locations. The New Norway co-operator practice deep tillage as well as rod weeding.
The New Norway field was worked in May and then again just before seeding. The soil was very loose at the time of seeding. Crop emergence was good.

It has been documented that deep tillage can be detrimental to soil moisture retention. Late seeding also often results in lower yields. These factors may have influenced yields at New Norway.

These results should be treated with caution. Uneven weed pressure may have influenced the yield results. No economic analysis was possible due to there being no difference in treatment yields. From the treatment information one can see that treatment costs for organic input products can be significant.