Mackenzie Applied Research Association

2005 Annual Report

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On February 21, 2006 the Fort Vermilion division of the North Peace Applied Research Association became officially incorporated as the:

MACKENZIE APPLIED RESEARCH ASSOCIATION

Although our name has changed, we will continue to work with producers, research groups, funding organizations and industry to provide applied research and extension to the Municipal District of Mackenzie #23.

Please note: The North Peace Applied Research Association—Fort Vermilion (NPARA) is the name we conducted research under in 2005 but we refer to ourselves as the Mackenzie Applied Research Association (MARA) in this annual report.

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 the Municipal District of Mackenzie #23.

Our Mission

To serve producers within the Municipal District #23 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.

Our Staff

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AESA Rural Extension Staff

Satoru Nosho
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ACKNOWLEDGEMENTS

We would like to acknowledge the contribution of local producers, municipal, provincial and federal governments as well as local and regional business and economic alliances. The success of our research program depends on the dedication of numerous individuals who are contributing their expertise, time, land and equipment to assist our Association in achieving its goals.

LOCAL COOPERATORS

Tony Batt
Henry Freisen
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Cornie Teichroeb
Roger Toews
Wally Toews
Peter Wieler

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ATB Financial
BASF
Dow Agro Sciences
Ducks Unlimited Canada
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La Crete Co-op
Neufeld Petroleum
Northern Stores
Parrish and Heimbecker (La Crete)
Philom Bios
Prairie Seeds
Reduced Tillage Linkages
SeCan
Tiger Industries
Symbiotech
UFA (La Crete)

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Joy Vonk

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Grey Wooded Forage Association (GWFA) — Albert Kuipers
Lakeland Agricultural Research Association (LARA) — Jay Byer
North Peace Applied Research Association (NPARA) — Marti Hurdal
Peace Country Beef and Forage Association (PCBFA) — Amber Havens
Smoky Applied Research and Demonstration (SARDA) —Tara Lea
West Central Forage Association (WCFA) — Kelli Claypool

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John Zylstra

ALBERTA SUSTAINABLE RESOURCES DEVELOPMENT PUBLIC LANDS

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Colin Stone
Wanita Uhersky

CANOLA COUNCIL OF CANADA

Raymond Gadoua
John Mayko

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)

PRAIRIE FARM REHABILITATION ADMINISTRATION (PFRA)

Dan Benson

REDUCED TILLAGE LINKAGES (RTL)

Peter Gamache
Nick Underwood

MARA Interim President's Message

I would like to give the staff of NPARA a heartfelt " Thank You" for the work that they did last year and the leadership roles they took in looking after and completing the projects that needed to be done. It was a challenging year for staff with the project coordinator in Manning resigning and Kelly in Fort Vermilion needing a maternity leave during the summer.

As a director on the NPARA board I know that the staff received little help from us. Those of us in the North did not see what the South was doing nor did we totally understand some of the programs and it was the same for those from the South with respect to programming in the North. This brought us to the point where we could look at spending more on administration or possibly keep more money in programming by becoming a more hands on board.

We had two distinct operations separated by a large distance with virtually no overlap of employees or equipment. The Agriculture Opportunity Fund (AOF) no longer restricted the number of Applied Research Associations in the Province. We, the directors of NPARA, felt that the best way to address the issue was to split NPARA into two separate organizations. It was unanimously approved at both special meetings and hence the Mackenzie Applied Research Association (MARA) was born to serve the needs of producers in M.D. # 23 .

Kelly is still with us as manager but Salvador, who carried the workload last summer , has taken a job at the University of Alberta for family reasons. I wish him well in his new job. I would like to welcome Satoru Nosho on Board. He grew up at Kobe, Japan where he took studies in forage management and beef feeding. He came to Lethbridge and was taking Agricultural Management studies.

In today's agriculture we need to keep our costs per unit of production as low as possible. There are always a lot of ideas but do they work in our situations. This is where MARA can fit in to try new ideas out and try to quantify them so that all of us as producers can benefit. I urge you to become members of MARA and to take an active part by being on the board, presenting ideas or being a cooperator to do projects.

MARA is our organization to benefit us as a group of producers to help us lower our costs per unit of production. It will be as successful as the producers of this region decide to make it.

Thank you for your past support.

John Simpson
MARA President
NPARA Director

MARA Interim Research Coordinator's Message

This past year has been full of both exciting and exhausting new developments. We have officially become the Mackenzie Applied Research Association (MARA) after a unanimous vote in favor by the membership. Good luck to NPARA and their new coordinator Andrea Vavrek.

Our applied research and AESA rural extension is now focused in the Municipal District of Mackenzie (#23). Our newly formatted and named newsletter, *Farming North of 58°* will be distributed quarterly and the radio farm show of similar name, hosted by myself, will be aired on CIAM radio's community profile every Saturday afternoon.

Another year passes and it is becomes harder and harder for our producers to reach their profit goals. Rising costs of inputs such as fuel and natural gas, combined with low commodity prices make farming a major challenge. MARA will also face budget challenges since our funding support from the provicial government has been reduced. Although the provincial government released a one-time capital fund to be distributed to ARECA members this year, many ARECA groups are faced with downsizing their programs and staff to compensate for static core funding and rising operating costs.

Best wishes to Salvador Lopez as he begins work with the University of Alberta in Edmonton. Sal completed two years as our Research Technician in Fort Vermilion and was a valuable contributor to our program and this annual report. Salvador worked hard completing our program last summer due to my maternity leave and I know some days were tough. Similarly, we wish Mike Hall, formerly an AAFRD / MARA collaborative partner well on his new position with Cargill in Yorkton, Saskatchewan. The loss of Alberta Agriculture, Food and Rural Development (AAFRD) at the experimental farm was unfortunate for agricultural research in northern Alberta. And thank you, of course, goes out to Joe and the Agriculture & Agri-Food Canada (AAFC) staff for the valued help every year. It was very much appreciated during the summer of 2005 in my absence.

Our office, formerly in the Alberta Infrastructure (AAFRD) unit has moved across the road into a AAFC building at the main north entrance of the farm. After a very long weekend painting walls and stripping wood floors, the office emerged with a new look. We are appreciative to AAFRD and AFSC for the low cost office space and equipment we have used for ten years.

Satoru Nosho, from the University of Lethbridge Cooperative Program, has been hired on as a Research Technician for this year. Sato, who is originally from Kobe, Japan, brings a wealth of information about beef and forage production and will be responsible for maintaining our research plots and data analysis. Sato has also been a valuable assistant working diligently to compile this annual report with me.

Of course the highlight of our year was when Tony and I welcomed our daughter Jessie Audrey to the world on June 26. She brings much joy to our lives and is growing steady. It is amazing to see her learning something new every day. I look forward to sharing agriculture with her.

I also look forward to working with producers under our new name, the Mackenzie Applied Research. Association. We encourage your support by purchasing a membership and attending our events.

Kelly Zeleny
MARA Research Coordinator
NPARA Assistant Research Coordinator

MARA Interim Technician's Message

My name is Sato. Originally from Japan, I started working at MARA in January 2006 as a technician. I was brought up in rural farm area and my father was farming on small piece of land (4-5 acres) as a side job. In the 1990s, the Japanese government promoted reduction of rice acreage, then my father quit growing rice and became a hobby farmer to grow vegetables for our own consumption. Many farmers in our area mainly depended on off-farm income.

I decided to attend agricultural high school even though farming was not so popular job at that time in Japan. To be honest, I hated studying in the classroom. I simply thought there were more field activities and experiments in agricultural high school than at other school. I enjoyed planting vegetable and taking care of cows. I entered university, but I was not so happy because studying agricultural theory, concept or principle made me tired and I lost my motivation.

After I graduating from university in Japan, I worked at beef farm in Kobe raising marbled beef. I was happy taking care of cattle and enthusiastic to learn. My life was fulfilled even thought I worked hard at over12 hours a day. However, I could not forget the August 2001. The shocking news came that mad cow disease was found in Japan. A few months later, many beef farmers were wiped out and so was our farm.

I realized that farming in Japan may be hopeless. That is why I came to Canada. I went to Lethbridge Community College and took agricultural technology and transferred to University of Lethbridge where I met Salvador who was a technician at NPARA. He told me that he was going to work at an experimental farm in northern Alberta, but I did not even imagine that I would take his position in the future.

Last fall, I was looking for a job through university. However, there were not many jobs offered. In November, Salvador emailed and recommended that I apply to MARA (formerly NPARA) and fortunately my offer was accepted. I was happy because I can work and learn. Simultaneously, I felt nervous because of my poor English.

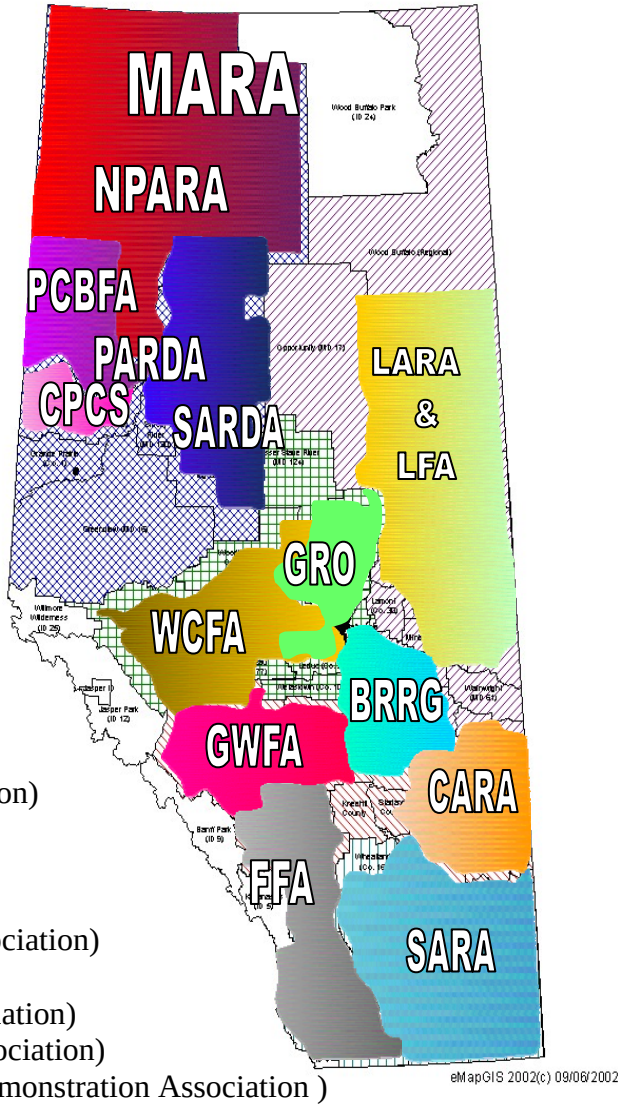
In addition, most of my Canadian friends in Lethbridge told me "It is too cold up there, there are lots of snow, big mosquitoes, and expensive food and gas..." Some of them were joking "Are you going to stay in igloo? You can see polar bears." They are many stereotypes about northern parts of Canada.

I want to say thank you to Research Coordinator Kelly Zeleny and other board members to allow me a great opportunity to be able to work here in Fort Vermilion. I am willing to make an effort and keep updating my skills and knowledge. Hopefully, I could contribute to association and local community life.

Sato Nosho
MARA Research Technician
NPARA Research Technician

Agricultural Research and Extension Council of Alberta (ARECA)

In response to changing needs and the new AAFRD funding structure, the applied research and forage associations came together to form the Agricultural Research and Extension Council of Alberta (ARECA) in 2003. ARECA is the umbrella organization that represents all the active forage and applied research association in Alberta. It is a provincial body funded by government and through its members; it is a key provider of unbiased applied research and technology transfer for Alberta producers.



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)

A History of ARECA and the Applied Research and Forage Associations

Applied research association and forage associations have been an important part of Alberta's agricultural landscape for many years. There are some associations that have been in existence for over thirty years. Whether new or old, they all share a very strong commonality; they were initiated by producers for producers, and for the growth and sustainable of rural Alberta.

Applied research associations have been effective at addressing local concerns and identifying opportunities in local agriculture. Over time, they have developed partnership to extend the impact of their work. Initially funded solely by membership and local municipalities, associations were limited to simple demonstrations and relied extensively on producer co-operation to carry out projects. A major step for applied research in the province came in 1983, when AAFRD's Plant Industry Division brought in the Applied Research Association Program. This allowed groups to access up to $100,000 each (maximum of $600,000 annually) of matching funding to help develop infrastructure and expertise through hiring of permanent staff. This fund allowed groups to carry out applied research in an reliable and timely fashion, further growing their partnership opportunities with private and public industry, for the benefit of local producers and the local agriculture industry. Another important step was accomplished when groups began co-ordinating some projects across agriculture regions, again increasing the impact of programs. In 2000, an Applied Research Specialist was hired further strengthen co-operative efforts.

The Forage associations have a similar history, but have remained more demonstration and extension focused, achieving a significant impact for the forage and livestock industry through increased awareness and producer adoption of beneficial management practices. The Forage Association Program administered through AAFRD's Animal Industry Division, had about $260,000/year available for the forage associations . In order to maximize the impact of available fund and deal with common issues more effectively, the Alberta Forage Council was formed in 1984 to facilitate co-operation and increase industry partnership opportunities.

AAFRD phased out the Applied Research Association and Forage Association Programs in 2002, and created a single new program-based fund called the Agriculture Opportunity Fund, which begin in 2003. This $1.5M matching fund allows applied research and forage associations to apply for funding based on program delivery, without a set per association limit. In order to increase the potential impact of the fund, in 2004 the eligibility criteria for applicants was expanded to included all not-for-profit societies and co-operatives doing agriculture related programs. In response to this opportunity and benefits of this opportunity and other benefits of co-operative initiatives, the Alberta Forage Council broadened its mandate to include applied research association and became the Agricultural Research and Extension Council of Alberta (ARECA). With the addition of a full-time executive director in 2004 and a committed board of directors, ARECA is responding rapidly to issue and opportunity in the agricultural industry. Programs are focused on providing measurable benefits for producers and working towards the overall health and prosperity of rural Alberta. ARECA is working together with its partners to help ensure the long-term economic and environmental sustainability of agriculture in Alberta.

2005 Extension Activities

One of the goals of our Association is technology transfer throughout the Municipal District of Mackenzie #23. This goal is achieved through the organization of meetings and workshops where our research program is shared with our membership. Our research program is also promoted through the use of newsletters and fact sheets that include information from other researchers and industry professionals.

Annual General Meeting

Our Annual General Meeting (AGM) was held in La Crete, AB on April 4. The format of the meeting was changed from an all day event to a evening meeting that included supper and guest speaker entertainment. A group of thirty eight members and their spouses enjoyed presentations from staff (program summary), Mike Hall (1954 Fort Vermilion promotional video) and Liesa Peters (history of La Crete).

Newsletters

The NPARA News was published twice in 2005 and distributed to 1000 farm mail boxes. Both newsletters featured staff writers as well as guest authors from Reduced Tillage Linkages (RTL), Alberta Environmentally Sustainable Agriculture (AESA), Woodlot Extension Council of Alberta, Prairie Farm Rehabilitation Administration (PFRA), Agriculture and Agri-Food Canada (AAFC), Agricultural Extension Council of Alberta (ARECA), Alberta Agriculture, Food and Rural Development (AAFRD), Canadian Grain Commission (CGC), Greenhouse Gas Mitigation Fund (GGMF), Ducks Unlimited Canada (DUC) and Agricultural Financial Services Corporation (AFSC).

Youth Agriculture Program

Funded by Classroom Agriculture Program

During the months of March, July and August, a series of interactive presentations were held in both classrooms and the field for school age children from 6-13 years of age. Topics included food animals, farm safety, vegetable and grain production, farming facts about the MD #23, agricultural research, soil science and water conservation. Children were encouraged to complete worksheets and identify “mystery” objects that were made from raw farm products.

Figure 1: Learning about potato production.

Annual Field Day

Sponsored by UFA (La Crete), Neufeld Petroleum and Reduced Tillage Linkages

The annual field day for the North Peace Applied Research Association—Fort Vermilion was held August 4. Fifty one producers joined the tour that covered both trials and demonstrations on barley and canola stand establishment, pea seed treatments, reduced tillage strategies, regional variety testing, specialty crops and growing corn for cattle. Lunch was followed by a door prize draw from local sponsors.

Figure 1: Touring the corn site.

Figure 2: Enjoying lunch at the Experimental Farm.

Insect and Crop Damage Assessment Day

Funded by Alberta Agriculture, Food and Rural Development

On July 14, fourteen producers attended an interactive field day hosted by Kimberly Zeleny, an Alberta Agriculture, Food and Rural Development (AAFRD) crop specialist from the Ag-Info Centre in Stettler, AB. During this field tour, producers had the opportunity to sweep fields for insects, learn identification characteristics, understand life cycles, assess crop damage and determine threshold levels for spraying from larvae or adult counts.

Figure 1: Determining grasshopper species differences.

Figure 2: Assessing crop damage from insects.

Pasture Management School

Part I: Funded by the Greencover Canada Technical Assistance Fund (GCTAF)
Part II: Funded by the Greenhouse Gas Mitigation Fund (GGMF)

The Pasture Management Schools were conducted by Greg Griffin, a Forage Specialist and rancher from Bluesky, AB, and the volunteer assistance of two local Fort Vermilion ranchers, Eric Jorgenson and Wally Toews. The purpose of this extension was to strengthen the managerial capabilities of owners and operators of beef cattle ranches. The pasture walk was an intense two-part course in pasture production that was offered all day on August 25, 2005. Better management practices (BMPs) were presented. These are necessary tools for land monitoring and pasture management methods aimed at discovering the root cause, not just the symptoms of problems, and then allowing ranchers to find their appropriate solutions to fix those problems. In Fort Vermilion twelve local ranchers attended this event. The main topics covered were plant population assessments, plant density, plant vigor, the importance of legumes in pasture mixes, weeds and brush control, ground cover, and soil fertility. In addition, this course provided ranchers the tools to assess plant and soil health conditions, identify problems or concerns in the pasture including overgrazing, and create solutions for the long-term in pasture management.

Figure 1: Pasture walk in progress.

Figure 2: Greg demonstrating plant density counts.

Environmental Farm Plans

Funded by the Alberta Environmental Farm Plan Company and Alberta Environmentally Sustainable Agriculture (AESA) program.

The Environmental Farm Plan (EFP) workshops were held in Fort Vermilion for two afternoons on June 13 and 20. A total of thirteen producers came out to work on binders and assess the environmental risks on their farms. The facilitators for these workshops were Yvonne Marshall-MacRae and Dan Benson (PFRA Peace River). Producers must have an Environmental Farm Plan completed if they plan to apply for the Canada-Alberta Farm Stewardship grants.

Riparian Management and Remote Watering Systems Day

Funded by the Alberta Environmentally Sustainable Agriculture Program (AESA)

Sandy Crichton, a producer and Kelln Watering Systems sales representative and Dan Benson, a remote watering systems specialist from Prairie Farm Rehabilitation Administration (PFRA) provided useful technical information to a group of fifteen producers on June 29. Two local producer sites were toured. Peter Wieler, who eliminated cattle access to the Peace River about four years ago when he constructed a remote watering system on his pasture, discussed his progression towards better riparian area management. The other site belonged to Henry Friesen, who was interested in a watering system for his pasture dugout. The Friesen site was established on this field tour and will be monitored during the upcoming field season.

Plant Breeder's Rights and Seed Act Forum

On March 23, twelve local producers attended an interactive meeting to discuss how they may be affected from the changes to the Seed Act and Plant Breeder's Rights Act. Speakers Jan Slomp, a producer and National Farmer's Union Alberta Coordinator and Andrew Rushmore, a producer, student and National Farmer's Union Youth Advisor fielded questions for discussion.

Reduced Tillage versus Conventional Tillage Demonstration
Barley/Canola Stand Establishment Demonstration

Funded by Reduced Tillage Linkages (RTL)

A group of twenty-seven producers joined Reduced Tillage Linkages agronomists Nick Underwood (RTL Peace Region) and Peter Gamache (RTL Team Leader) on August 4 for a local tour. The side by side site demonstrated reduced tillage practices by producer Peter Friesen and conventional tillage practices by producer Tony Batt. Cornie Teichroeb's stand establishment site was visited later. Topics covered included the benefits of reduced tillage, residue management, equipment applications, determining plant density and input management.

Figure 1: Counting plants to determine plant density.

Figure 2: Reduced tillage site near Fort Vermilion.

Prairie Canola Variety Trials

Funded by the PCVT Program Coordinated by the Canola Council of Canada

Written by Kelly Zeleny and J. Salvador Lopez

Abstract

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

Background

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 standardize 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 Canada each contribute to PCVT. Trials were conducted by seed companies, government researchers and independent contractors in three growing zones across the prairies: 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 comparisons could be made between varieties.

The PCVT Trials are grown in three major maturity zones: short (roughly corresponds to Alberta agro climatic areas 4, 5, and 6), mid (areas 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 summary is also published by Alberta Agriculture. Yield columns show the actual yield of the check (46A65) 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 were later. Although variety trials are carefully conducted, small percentage differences in yield are usually meaningless. Check the LSD (Least Significant Difference) of the test. If the difference between two varieties is less than the LSD, the varieties are not considered different. The CV (Coefficient of Variation) gives an indication of the

random variability in the test. The smaller the CV, the better the test. It is wise to consult different sources of information when choosing a variety of canola.

Objectives

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

Results

Table 1: 2005 Fort Vermilion Agronomic data - Canola PN S1. Check variety 46A65.

Variety	Yield (bu/acre)	Height (cm)	Maturity (days)	Lodge (1-9)	Seed Size (g/1000)
InVigor 5020	50.2	105	-2	2	5
9451	45.0	110	-1.5	2	5.02
45H25	44.5	113	-3	2	5.04
46A65	44.3	113	0	2	4.62
45H21	42.5	105	-2	2	4.66
GLADIATORR	42.2	104	-2	2	4.68
AV 9525	41.6	105	0	2	4.8
829 RR	41.1	99	-1.5	2	4.8
9550	40.3	109	-2	2	5.24
AV 9618	39.8	115	0	2	4.98
904 RR	38.5	100	0	2	4.74
SW G5235 RR	38.0	110	-1	2	5.8
SW 6802	37.6	102	-2	2	4.3
43A56	37.5	111	-5.5	2	4.24
45H72	37.1	118	-1	2	5
1896	36.7	102	-2.5	2	5.02
FORTUNE RR	36.6	104	-1.5	2	5.62
SW5231	35.4	90	-2	2	5.66
LSD at 0.05	**10.1**				
CV	**17.6**				

Figure 1. Canola Variety Trial

Table 2: 2005 Fort Vermilion Agronomic data—Canola PN S2. Check variety 46A65.

Variety	Yield (bu/acre)	Height (cm)	Maturity (days)	Lodge (1-9)	Seed Size (g/1000)
InVigor 5030	66.4	114	+1	2	5.02
45H24	64.5	110	-1	2	5.42
Z2409	62.8	111	0	2	5.12
V1030	61.4	109	-3.5	2	4.62
InVigor 5070	60.8	115	+1	2	4.96
423 RR	60.7	111	+0.5	2	4.72
SP Desirable RR	59.7	113	-2	2	5.26
V1031	59.7	112	-3	2	4.6
SP BANNER	58	109	-1	2	4.8
46A65	56.9	107	0	2	4.88
SW G5246 RR	56.3	113	-1	2	4.68
292CL	55.7	107	-1	2	4.7
SW G5251 RR	55.4	115	-1.5	2	4.56
624 RR	55.2	109	0	2	4.8
163-12	54.9	109	-0.5	2	5.4
RE 3040-02.4	54.9	101	+1	2	4.5
46H23	54.5	108	0	2	5.56
46H70	51.9	108	0	2	4.76
SP Deliver CL	43.9	101	-1.5	2	4.68
NR01-5660	40.9	104	0	2	5.2
LSD at 0.05	**10.59**				
CV	**13.2**				

Discussion

A small number of canola cultivars command the market share and the lifespan of many cultivars is limited. Of the cultivars tested in 2004, only twelve remain in the 2005 test. This test provides producers with objective agronomic data to assist them with variety selections of canola.

When making a decision on cultivar selection consider several agronomic factors and sources of information.

Regional Variety Trials

Funded by the Regional Variety Testing Program, AAFRD

Polish Canola Co-op Trials

Funded by Agriculture & Agri-Food Canada (AAFC)

Written by Kelly Zeleny and J. Salvador Lopez

Abstract

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 normal growing conditions may perform excellent in optimum growing conditions. If more information is required on a particular variety please contact our office.

Background

The Alberta Cereal and Oilseed Regional Variety Testing Program tests varieties of cereal and oilseed crops to evaluate yield, disease and lodging resistance and maturity. This data along with supplemental data from other sources is used to prepare fact sheets and other technology transfer materials for farmers and other users of this information. This fact sheet is one of the most utilized publications that Alberta Agriculture produces and is a very important extension tool for extension specialists, the seed industry, and producers.

A proliferation in the number of registered varieties and a reduction in the level of support for variety testing from government have necessitated restructuring the way the regional variety testing program is organized and funded. Currently, an entry fee is charged for all cultivar submissions in the cereal testing program. These testing fees are combined with grants and in kind support from other agencies. Costs associated with setting up the regional trials are deducted and the residual funds are distributed to all co-operators, such as MARA, conducting trials. This approach forms the basis for delivering a sustainable variety testing program to the entire seed industry. All co-operators receive the same level of funding.

In 2006, ARECA (Agricultural Research and Extension Council of Alberta) will be administrating the program. A committee will be investigating several options for 2007, including a prairie wide program.

The Polish Co-op trial was established in collaboration with Agriculture & Agri-Food Canada in Fort Vermilion. These Co-op trials assess the agronomic characteristics of Polish canola across Western Canada.

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.

Material s and Methods

The 2005 regional variety trials consisted of 11 lines of 6-row barley, 12 lines of 2-row barley, 10 lines of flax, 10 lines of oats, 6 lines of utility wheat, 16 lines of hard red spring wheat, 4 lines of triticale, 12 lines of yellow peas and 6 lines of green peas. This year the Polish Co-op trial consisted of 25 lines of polish canola sent from Agriculture & Agri-Food Canada (AAFC).

For each crop, the seeding rate was determined from the 1000 kernel weight of each variety. Wheat and barley were planted at 24 seeds per square foot and flax at 74 seeds per square foot. All seed was treated —cereal and flax seeds with Raxil. Plots were planted at 6.5 meters in length with four rows 12 inches apart. 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 27-11-9-4 was banded at a rate of 200 lbs/acre.

Cereal trials were replicated three times and flax and pea trials were replicated 4 times in a randomized complete block design. 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.

Table 1: 2005 Variety Trial Management Information

Crop	Seeding Date	Harvest Date	Previous Crop	Fertilizer NPKS (lb/ac)	Herbicide	Application Rate/Acre
Oats	May 25	August 31	Canola	27-11-9-4 200 lbs/ac	Buctril M	400 ml
Wheat	May 25	September 14	Canola	27-11-9-4 200 lbs/ac	Buctril M	400 ml
Barley	May 25	August 22	Canola	27-11-9-4 200 lbs/ac	Buctril M	400 ml
Triticale	May 25	September 27	Canola	27-11-9-4 200 lbs/ac	Buctril M	400 ml
Canola	May 10	September 20	Barley	27-10-9-4 200 lbs/ac	Post Ultra +Lontrel + Merge	190, 113, 400 ml
Polish Canola	June 03	September 30	Fallow	27-10-9-4 200 lbs/ac	Treflan	1 Liter
Flax	May 13	October 21	Barley	27-10-9-4 200 lbs/ac	Buctril M	400 ml
Field Peas	May 09	September 07	Canola	No fertilizer	Odyssey	17 grams

A 125-C Hege plot harvester was used and the samples were sent through a Clipper seed cleaner and then evaluated for field yield, test weights and 1000 kernel weights.

Statistical Analysis

Crop yield averages (or means) of agronomic data are listed throughout the body of the data tables. The least significant difference (LSD) and the coefficient of variation (CV) are listed at the bottom. The LSD is given at the 5 percent error level and is an aid in comparing varieties. If the measured values of any two varieties differ by the LSD value or greater, they may be considered different with a confidence level of 95%. If the measured values are less than the LSD value, the differences may be due to random error rather than real differences.

Coefficient of variation (CV) is also included in the tables. This is given as a general measurement of the accuracy of each experiment. Lower CV percentage values indicate less experimental variation and greater reliability in results. Also this indicates that environmental conditions were uniform during the experiment and that the differences among varieties are due to treatment characteristics. High CV values indicate that non-treatment conditions are affecting the results of the replications, therefore making the experiment less statistically accurate. According to some statisticians a CV greater than 15 % is questionable and may not be accepted as statistically sound.

Results and Discussions

The 2005 growing season progressed with steady rainfall amounts. This influenced good growing conditions and therefore, establishment of all the trials (Figures 1 & 2). Throughout the growing season all the trials did not show any insect, disease, weed and lodging problems. By mid August the barley trials had some minor hail damage.

Figure 1: Flax Variety Trial

Figure 2: Cereal Variety Trial

Maturity for cereals is recorded as a + / - from the check variety. For example, Calder two row barley is one day (+1) later maturing than the check Harrington (at 98 days).

Results and Discussion

Tables 2 - 10 summarize the data obtained in the year 2004 growing season.

Table 2: 2005 Fort Vermilion Agronomic Data—Two Row Barley

Variety	Yield (bu/acre)	Height (cm)	Maturity (+/-)	Lodge (1-9)	Seed Size (g/1000)
XENA	96	57	+1	1	52.92
SEEBE	95.2	73	0	1	55.64
CDC COWBOY	91.3	76	0	1	59.96
PONOKA	88.8	64	-1	1	53.96
CALDER	86.4	66	+1	1	53.34
CONRAD	85.6	61	-1	1	49.7
MCLEOD	84.2	49	0	1	49.26
CONLON	80.7	63	0	1	53.04
TR03661	79.5	68	0	1	53.1
HARRINGTON	77.3	59	98 days	1	46.8
AC METCALFE	74.9	57	0	1	51.36
CDC TREY	74	57	-1	1	51.02
LSD at 0.05	**15.1**				
CV	**10.52**				

Table 3: 2005 Fort Vermilion Agronomic Data—Six Row Barley

Variety	Yield (bu/acre)	Height (cm)	Maturity (+/-)	Lodge (1-9)	Seed Size (g/1000)
MANNY	88.4	61	0	1	42.86
BT566	87.4	69	0	1	47.3
KASOTA	86.9	62	-2	1	36.86
CDC CLYDE	86.8	62	0	1	42.16
AC METCALFE	83.7	61	0	1	51.76
VIVAR	81.5	61	0	1	47.62
LEGACY	75.1	64	-1	1	40.76
HARRINGTON	74.2	59	98 days	1	47.22
TROCHU	73	59	0	1	42.74
CDC BATTLEFORD	69.6	62	-1	1	43.9
TRADITION (BT 954)	66.2	60	0	1	42.72
LSD at 0.05	**11.74**				
CV	**8.69**				

Table 4: 2005 Fort Vermilion Agronomic Data - Triticale

Variety	Yield (bu/acre)	Height (cm)	Maturity (+/-)	Lodge (1-9)	Seed Size (g/1000)
PRONGHORN	92.5	99	115 days	2	55.22
AC ULTIMA	89.7	88	+1	1	44.76
AC ALTA	88.5	84	+3	1	53.56
COMPANION	80.7	113	+1	4	47.74
LSD at 0.05	**12.97**				
CV	**7.39**				

Table 5: 2005 Fort Vermilion Agronomic Data - Hard Red Spring Wheat

Variety	Yield (bu/acre)	Height (cm)	Maturity (+/-)	Lodge (1-9)	Seed Size (g/1000)
AC SUPERB	61.6	63	+4	1	48.16
AC BARRIE	59.3	70	110 days	1	49.6
CDC GO	58.7	62	-1	1	38.08
PT211	57.9	73	-1	1	42.54
AC INFINITY	57.3	72	+2	1	38.88
CDC JOURNEY	56.3	69	-1	1	40.52
5602HR	55.8	78	+1	1	42.2
BW 301	53	72	+1	1	38.28
CDC IMAGINE	51.2	70	0	1	46.22
PEACE	51.2	76	0	1	43.56
PARK	49.1	71	+2	1	44.28
LOVITT	48.7	75	+1	1	40.12
KATEPWA	45.9	69	-2	1	38.5
LILLIAN	44.8	71	0	1	41.16
CDC OSLER	43.3	66	0	1	43.36
5601HR	42.4	64	+1	1	40.24
LSD at 0.05	**8.65**				
CV	**9.92**				

Table 6: 2005 Fort Vermilion Agronomic Data- Utility Wheat

Variety	Yield (bu/acre)	Height (cm)	Maturity (+/-)	Lodge (1-9)	Seed Size (g/1000)
HY 476	44.1	64	0	1	51.34
AC TABER	42.7	63	0	1	49.78
CDC RAMA	41.9	79	-1	1	55.6
5701PR	40.4	71	-0.5	1	48.56
AMAZON	39.1	73	-0.5	1	51.06
HY 475	26.6	59	-1	1	55.72
LSD at 0.05	**9.02**				
CV	**12.67**				

Table 7: 2005 Fort Vermilion Agronomic Data—Oats

Variety	Yield (bu/acre)	Height (cm)	Maturity (+/-)	Lodge (1-9)	Seed Size (g/1000)
CDC BALER	103.58	97	0	2	52
MURPHY	97.45	94	-1	2	45.88
CASCADE	95.21	89	105 days	2	41
SW BETANIA	87.09	83	-2	2	46.6
LEGGETT	85.18	81	+3	2	49.14
AC FURLONG	81.35	89	+1	2	41.56
AC LU	79.97	83	0	2	53.4
CDC SOL-FI	79.07	95	0	2	57.4
CDC WEAVER	76.74	96	+2	2	48.26
OT 566	64.63	84	+1	2	45.1
SLD at 0.05	**11.49**				
CV	**7.88**				

Table 8: 2005 Fort Vermilion Agronomic Data—Flax

Variety	Yield (bu/acre)	Height (cm)	Maturity (+/-)	Lodge (1-9)	Seed Size (g/1000)
2090	25.9	55	0	1	6.52
HANLEY	23.1	54	+2	1	6.9
1084	22.2	57	+1	1	6.6
CDC BETHUNE	21.2	51	0	1	7.92
FLANDERS	21	54	+1	1	7.1
CDC NORMANDY	20.3	55	+2	1	6.5
2047	19.5	57	0	1	7.1
NORLIN	19.5	53	0	1	6.28
2149	19.2	52	+2	1	7.22
FP 2141	16.5	53	+3	1	7.04
LSD at 0.05	**8.79**				
CV	**29.08**				

Table 9: 2005 Fort Vermilion Agronomic Data- Green Pea

Variety	Yield (bu/acre)	Height (cm)	Maturity (ranking)	Lodge (1-9)	Seed Size (g/1000)
COOPER	46.87	45	L	4	268.4
SAGE	38.44	61	M	4	326.4
CDC STRIKER	38.16	47	M		266
CAMRY	37.25	37	M	4	294.4
NITOUCHE	36.2	51	M	4	251.6
STRATUS	35.68	37	M	4	314.4
LSD at 0.05	**12.48**				
CV	**21.37**				

Maturity ranking: E=early maturity dates, M=mid maturity dates and L=late maturity dates.

Table 10: 2005 Fort Vermilion Agronomic Data -Yellow Pea

Variety	Yield (bu/acre)	Height (cm)	Maturity (ranking	Lodge (1-9)	Seed Size (g/1000)
MIDAS	36.3	50	E	4	281.6
CDC 653-8	34.3	47	E	4	287.2
CUTLASS	33.1	45	E	4	222
SW MARQUEE (SW A5122)	32.9	53	E	4	280.8
CDC BRONCO	30.8	42	M	4	252.8
CDC GOLDEN	28.1	48	M	4	214
DS ADMIRAL	26.2	45	M	4	255.2
CDC HANDEL	23.1	42	L	4	291.2
CDC MOZART	21.2	38	M	4	282.4
TUDOR	21	44	M	4	286.8
SW CIRCUS	19	39	E	4	290.4
CARRERA	18.9	33	E	4	246
LSD at 0.05	**11.33**				
CV	**28.98**				

Maturity ranking: E=early maturity dates, M=mid maturity dates and L=late maturity dates.

Table 11 : 2005 Fort Vermilion Agronomic Data—Polish Canola

Variety	Yield (bu/acre)	Height (cm)	Maturity (days)	Lodge (1-9)
F1 AC Sunbeam x TR14	40.1	106	97	1
Syn1-5 TR4/TR8	36.4	111	97	1
Syn1 CompB_DH/Comp4	35.5	112	98	2
F1 AC Sunbeam x CompB_DH	35.1	106	98	1
AC Sunbeam	33.1	108	97	1
F1 AC Sunbeam x TR1_BL	31.9	117	99	2
Syn1 DH_TR3/6757	31.8	113	98	1
F1 TR3 x TR14	31	124	99	1
Syn1 CompB_DH/TR4	30.2	104	99	1
F1 AC Sunbeam x TR1_DH	30	108	99	1
Syn1 CompB_DH/6757	29.2	114	99	2
F1 AC Sunbeam x 6757	28.3	115	99	2
ACS-C7	28.2	105	90	1
Syn1 DH_TR3/TR4	28	107	99	1
F1 TR3 x Comp4	27.9	116	99	1
F1 TR3 x TR1_DH (op)	27.5	112	98	1
AC Boreal	27.3	112	99	2
F1 TR3 x TR1_BL	26.9	110	99	1
F1 TR3 x CompB_DH	26.7	110	102	2
Syn1 CompB_DH/DH_TR3	26.7	103	99	1
Syn1 DH_TR3/Comp4	26.6	123	99	2
ACS-C18 (6757/TR8)	25.9	114	99	1
Syn1 TR8/Comp4	25.5	108	99	2
F1 AC Sunbeam x ACS-C7	24.9	122	99	1
F1 TR3 x TR4	20.9	112	111	1
LSD at 0.05	**9.83**			
CV	**23.61**			

Alberta Pest Survey

Funded by Agriculture, Food and Rural Development (AAFRD)

Written by Kelly Zeleny

Introduction

Insect forecasting, or estimating what the populations of insects will be in an upcoming growing season is an important tool for producers. The purpose of these pest surveys is to collect data on crop insects and/or crop pests. Through networking and providing alerts, producers may have access to this information in a timely matter. This information can be used to make immediate crop decisions such as spray timing.

Forecasting is based on many factors, including the population numbers collected by surveyors, environmental conditions and natural predators. Some insect populations can be predicted in the fall before the growing season while other insect populations must be monitored actively during the growing season by weekly monitoring as outlined in Table 1.

Table 1: Insect Forecasting

Insect	Predictions that are difficult to make from a previous year.	Predications that can be made because summer/fall populations may reflect the populations in the upcoming growing season.
Fleas Beetles		X
Cutworms		X
Diamondback moth	X	
Bertha armyworm	X	
Grasshoppers		X
Lygus bugs	X	
Wireworms		X

The Alberta Pest survey was coordinated by the Agricultural Research and Extension Council of Alberta (ARECA). Training on trapping methods, insect identification and field work was provided in collaboration with Agriculture, Food and Rural Development (AAFRD) to technicians. Insect numbers were assessed in the field and compiled at the Fort Vermilion office. These were posted immediately on the AAFRD website http://www.agric.gov.ab.ca (Link Diseases/Insects/Pests). The Pulse Agronomy Network (or PAN) was also informed of insect populations an d pressure areas in the MD #23 for their email bulletins to producers.

Objectives

- To collect field data on pest populations in various areas in the MD #23.
- To provide data to the internet site where producers may obtain alerts or bulletins through the growing season in a timely manner so that they can use this information during their spraying decisions.

Materials and Methods

A field that will be surveyed is selected. The crop in the field will determine what insect pest the surveyor will be monitoring (for example: canola field = flea beetles). There are several methods of determining insect populations (Table 2). Square meter counts are completed by a visual observation of insects on the crop within a one meter by one meter area. Sweeping refers to the large nets used to 'sweep' across the crop and collect insects. Several traps may also be used, each of them specifically designed to the pest they are intended to collect and often they contain one or more attractants or pheromones to lure insects towards the trap. A pheromone is a chemical substance that is produced by an insect and serves as a stimulus to other individuals of the same species for behavioral responses such as mating. Some traps may also have a sticky grid to which the insect adheres to.

Figure 1: Bertha armyworm larvae

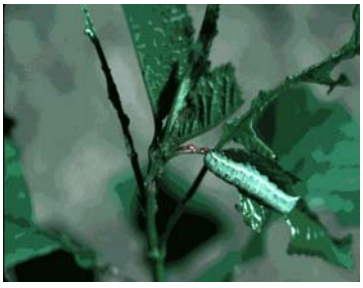


Figure 2: Bertha adult moth

Figure 3: Bertha Trap

Insect populations will vary depending on existing weather conditions. Also, threshold levels or insect tolerance by plants will increase as the plant becomes larger. Each insect will cause damage to crop plants during different times of the growing cycle and weather conditions such as drought will generally decrease plant tolerance to insect damage.

Table 2: Insects Surveyed in 2005.

Insect Surveyed	**Monitored During this Time of the Year (may vary depending on weather conditions)**	**Survey Method Used**	**Threshold Levels**
Grasshoppers	May—September	Square meter (m^2) counts	8-12/ m^2
Diamondback Moth	May—August	Larvae- m^2 counts Adult-grid traps	Larvae- 2-300/m^2 Adult-
Lygus Bugs	May - August	Sweeps	Depends on stage of crop
Bertha Armyworm	June—August	Worm- m^2 counts (Figure 1) Adult –lantern trap (Figures 2 &3)	Worm– 20/m^2
Flea Beetles	May –September	Cotyledon damage assessment	25 % of cotyledon damage
Cutworms	July—September	Numbers in Soil	3-4 pale/m^2 5-6 redback/m^2

Conclusion

It is important to monitor your fields throughout the growing season. Start scouting when the crop emerges from the ground. Take note of insect presence and/or damage as well as existing weather temperature and conditions. Learn insect identification techniques and insect threshold levels to determine appropriate times to spray and which specific insecticides to use. These tools are provided at MARA workshops so that producers may avoid inappropriate or over-spraying and preserve the beneficial insect populations in their area.

Remember, there are many contacts that can be searched for information including local applied research associations, the websites (www.agric.gov.ab) and the Alberta Ag-Info Center (1-866-882-7677).

Evaluating Agronomic and Economic Values of High Quality Canola Seed

Funded by the Canola Agronomic Research Program (CARP)

Written by J. Salvador Lopez and Kelly Zeleny.

Abstract

The effect of seeding date and swathing time on canola seed vigour has been investigated at different locations in the province of Saskatchewan. Results obtained from these field studies conducted in 2004 show that both seeding date and swathing time had an effect on canola seedlot performance. Seedlots obtained from canola that was seeded prior to May 20, 2003 resulted in higher seedling establishment, canola biomass, and seed yield compared to seedlots that were seeded on June 3. Also, seedlots that were swathed with less than 20% seed moisture content resulted in higher seedling establishment and seed yield as well.

Introduction

The Peace River region of Alberta offers some of the most challenging conditions for canola stand establishment in Western Canada. In the Peace region, only 20 to 40% of *B. rapa* and 25 to 30% of *B. napus* seeds can be expected to produce plants (Canola Growers Manual). Under average conditions, about 40 to 60% of seed sown will produce plants in most areas of western Canada. Soils in the Peace region are low in organic matter and prone to crusting. Moreover, producers are pressured to seed canola into cold soils since the growing season is short. Therefore, Alberta's Peace River region offers ideal conditions for assessing differences in seed vigour in the field through performance on stand establishment, and yield.

Objective

- To evaluate the effect of seed production practices on canola seed performance in Fort Vermilion, AB.

Materials and Methods

Seedlots of canola (cv. LG3455) were obtained from the Scott Research Farm. This was produced in 2004 from seed sown at three seeding dates (May 6, May 20, and June 3) and swathed at 5 different stages: swath 1 (60% moisture), swath 2 (20% moisture), swath 3 (10% moisture), swath 4 (10% moisture), and straight cut (10% moisture).

In 2005, the seedlots were direct seeded in a factorial randomized complete block design at the Fort Vermilion Experimental Farm, Alberta. The site was previously seeded with barley. The plots were sown at a rate of 33 seeds/m row. The seed was treated with Helix Extra prior to seeding. Plot size was 6 meters (m) long at seeding, (5 m at harvesting) and 1.5 m in width. Fertilizer was applied according to soil test results at a rate of 150 lbs/ac (22 – 11 – 51 – 4). Weed control was accomplished with Lontrel® and Post Ultra® applied at recommended rates and timing; one application during the growing season. No insect, disease, weed, and lodging problems were observed.

Data collection included seedling emergence counts at 14 and 21 days after seeding (das), canola seedling fresh weights at 14, 21, and 28 das, and canola seed yield. Canola seedling fresh weight was determined by random collection of 10 canola plants per plot and immediate weighing. Field results were analyzed using the Agriculture Research Manager (ARM) statistical software.

Results and Discussion

Seedling emergence

There was no interaction between seeding date and swathing time on plants/m² at 14 and 21 days after seeding. Seeding date had a significant effect on canola seedling emergence at 14 das but not at 21 das (Table 1). Also, swathing time had a significant effect on canola seedling emergence at 14 and 21 das (Table 2); with the straight- cut treatment having the highest plant emergence.

Seedling fresh weight (grams/10 plants)

Seeding date did not have a significant effect on canola seedling fresh weight (g/10 plants) at 14, 21 and 28 days after seeding (Table 1). However, swathing stage had a significant effect on fresh weight at 14 and 21 das, but not at 28 das. The seed derived from swathing stage 1 resulted in the lowest canola seedling fresh weight at all evaluation timings (Table 2).

Table 1: Seeding date factor means of plants/m² and fresh weight/10 plants

Seeding date	14 DAS plants/m²	21 DAS plants/m²	14 DAS Fresh weight/10 plants (grams)	21 DAS Fresh weight/10 plants (grams)	28 DAS Fresh weight/10 plants (grams)
May 6, 2005	113	113	0.55	2.46	23.23
May 20, 2005	91	120	0.52	2.32	21.83
June 3, 2005	80	106	0.49	2.24	19.51
LSD @ 0.05	16.6	32	0.06	0.59	3.79
P Value	0.0072	0.5894	0.1291	0.66	0.1282

Table 2: Swathing stage factor means of plants/m² and fresh weight/10 plants

Swathing Stage	14 DAS plants/m²	21 DAS plants/m²	14 DAS Fresh weight/10 plants (grams)	21 DAS Fresh weight/10 plants (grams)	28 DAS Fresh weight/10 plants (grams)
Swathing 1 @ 60% moisture	74	77	0.43	1.73	17.22
Swathing 2 @ 20% moisture	89	117	0.52	2.43	23.03
Swathing 3 @ 10% moisture	96	123	0.52	2.46	21.03
Swathing 4 @ 10% moisture	103	119	0.59	2.36	25.02
Straight Cut @ 10% moisture	111	131	0.55	2.7	21.31
LSD @ 0.05	18.9	28	0.08	0.52	6.08
P Value @ 0.05	0.0111	0.0102	0.0097	0.0187	0.1389

Yield grams/treatment

There was no interaction between seeding date and swathing stage on canola yields. Also, seeding date did not have any significant effect on yield (Table 3 and Figure 1). However, the effect of swathing time was significant. Swathing 4 had the highest yield and swathing 1 had the lowest yield.

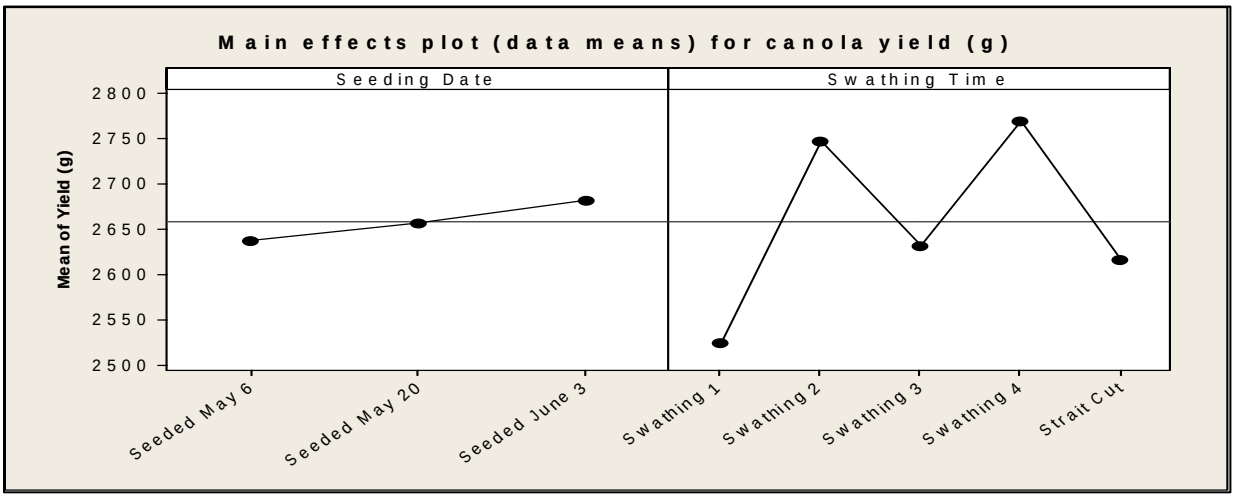
Table 3: Seeding date factor means of canola yield

Seeding date	Yield g/treatment	Yield bu/acre
Seeded May 6	2637.47	62.8
Seeded May 20	2656.78	63.2
Seeded June 3	2681.78	63.8
LSD @ 0.05	174.67	
P Value @ 0.05	0.8289	

Table 4: Swathing stage factor means of canola yield

Swathing stage	Yield g/treatment	Yield bu/acre
Swathing 1	2525.23	60.1
Swathing 2	2747.74	65.4
Swathing 3	2632.99	62.6
Swathing 4	2769.92	65.9
Straight Cut	2617.5	62.3
LSD @ 0.05	124.27	7.56
P Value @ 0.05	0.006	0.006

Figure 1: The Influence of Seeding Date and Swathing Time on Mean Yields (g)



Conclusion

The results obtained in this study confirm previous research results from different locations in the province of Saskatchewan. Canola seeded prior to May 20 and swathed at less than 20% seed moisture content produced the best performing seedlots. Seed growers should aim to plant canola early to mid-May in order to produce high vigour seeds. Also, seed growers should swath canola later than producers who swath canola for processing as this can result in higher vigour seed.

Economics of Using Seed Treatments for Control of Pythium and Rhizoctonia in Field Peas

Coordinated by the Agricultural and Research Extension Council of Alberta
Funded by the Alberta Pulse Growers

Abstract

With the increase acres in field pea acreage during the past 10 years, many producers are now growing field peas for the second or third time in their crop rotation. The potential for soil borne diseases is known to increase in these conditions.

Field peas (Nitouche variety) were seed treated with Apron®, Jazz®, and Vitavflo 280® and compared to an untreated check of the same seed lot at several locations across Alberta: near Killam, Fort Kent and Fort Vermilion. There were no significant yield differences recorded at any of the sites.

Background

Researchers at the Alberta Research Council have shown the benefits of using seed treatment in field peas for the control of root diseases when disease inoculum is present. They have speculated that yield losses from diseases such as pythium and rhizoctonia may be an overlooked as a major factor limiting pea yields, although this is unproven. Many producers have had field peas in their rotation for several years, potentially leading to increased disease inoculum levels in the soil. If inoculum builds up to high enough levels, seed treatment is of great economic value. If there is little or no inoculum build-up under normal rotations, then fungicidal seed treatments may not be economical. In addition, 20/20 Seed Labs has documented that poor stand establishment with lower vigour seed is more likely when extra stresses occur with deep seeding.

In 2005, three applied research associations; Mackenzie Applied Research Association, Lakeland Applied Research Association, and Battle River Research Group conducted a multi-site study comparing the seed treatments Vitavaflo 280®, Apron®, and Jazz® on field peas.

Objectives

- To determine the economics of using fungicidal seed treatments.
- To determine if depth of seeding influences the risk of soil-borne disease development when using treated versus untreated seed.

Methods

The trial was set up as a factorial design with two factors and three replicates. The first factor was field peas (v. Nitouche) seed treated with either Vitaflo 280® at 3.3 ml/kg, Apron Max® at 3.25ml/kg, and Jazz® at 3.6 ml/kg or untreated seed. Factor B was seeding depth (2 inches vs. 4 inches). The seed pea 1,000 kernel weight was 288 grams. A vigour test by 20/20 labs showed a germination of 79%. Therefore, Nitouche Field peas were treated with the seed treatments, Vitaflo 280®, Apron®, and, Jazz® by GroTech. The seedlots along with untreated seed were divided and distributed between the co-operators so that the same seed was used at each location. The peas had a seed weight of 288 grams/1000 seeds with 79% germination. To target a plant population of 7 plants/f², the seeding rate was 4.1 bushels/acre. The seeding rate was 170 lbs per acre.

Results and Discussions

According to the results obtained from this trial there was an interaction between seeding depth and Jazz® fungicide (Fig. 1). This means that when using Jazz fungicide as a seed treatment, yields will depend on seeding depth. In this case, the optimal seeding depth when using Jazz® fungicide is 2 inches. To the contrary, the other seed treatments achieved a higher yield when the seeding depth was 4 inches. In addition, Vitaflo® 280 and seeding depth of the 4 inches treatment achieved the highest yield in this study (Fig. 2). When the seed was treated with Vitaflo 280® and seeded at a depth of 4 inches, the yield was 77 bu/ac. If we compare this treatment with untreated seed and seeding depth of 4 inches, the yield difference was about 26 bu/ac. The current price of a 10-litter jug of Vitaflo 280® is about $ 237. At the recommended application rate of 330 ml per 100 kg of seed and seeding rate of 244 lbs/ac (approximately 4 bushels), the extra cost of applying Vitaflo 280® would be $8.65 dollars per acre. Assuming market price of $ 3.00/bu for field pea, treating the field pea seed with Vitaflo 280® would generate an extra revenue of $ 69.35/ac (26 bu/ac * $3 – 8.65). Out of this revenue the cost of mixing the fungicide with the seed would need to be subtracted.

LOCATION	BRRG-Killiam	LARA-Fort Kent	NPARA-Fort Vermilion
TREATMENT SIZE	22 x 4.5 ft Fabro no till drill	N/A	30 x 12 ft ConservaPak no till drill
PREVIOUS CROP	Wheat	Wheat	Canola
FERTILIZER	25 lbs/acre phosphate with seed	25 lbs/acre phosphate with seed	25 lbs/acre phosphate with seed
TILLAGE DETAILS	direct	reduced	reduced
SEEDING DATE	May 4	May 11	May 9
WEED CONTROL	Odyssey	Treflan	Odyssey
HARVEST METHOD/DATE	September 2	September 23	September 12

To evaluate consistency of yields this trial should be repeated at field scale.

Figure 1: Effect of seed treatment and seeding depth on field pea yield

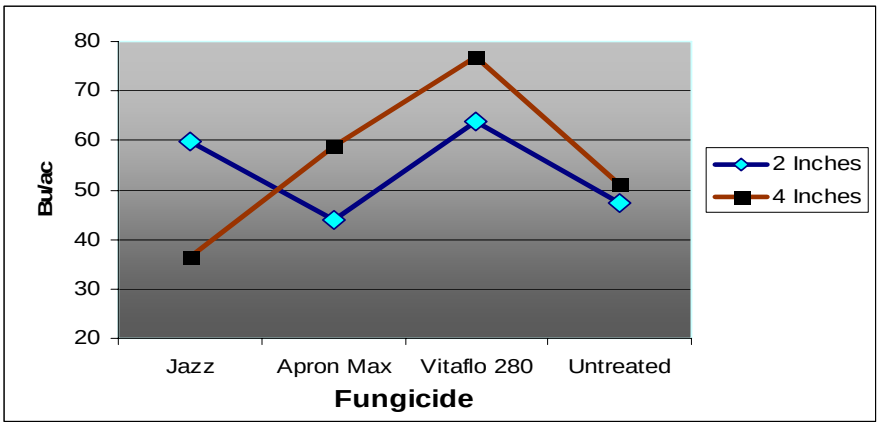
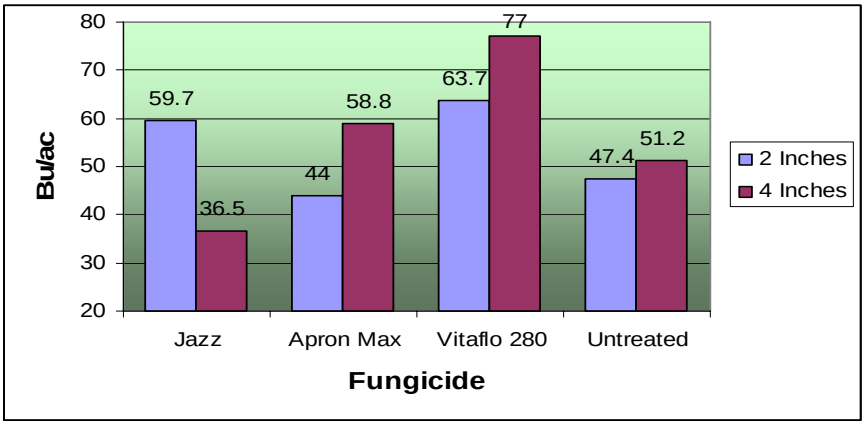


Figure 2: Effect of seed treatment and seeding depth on field pea yield.



Conclusions

Yield response to seed treatment was greater when the field pea seed was treated with Vitaflo 280® and seeded at a depth of 4 inches. Seeding depth had a significant effect on field pea yield, specifically with Jazz seed treatment and a seeding depth of 2 inches.

Figure 3: Pea Seed Treatment Trial – Fort Vermilion (May)

Figure 4: Pea Seed Treatment Trial – Fort Vermilion (July)

Thank-you to the Agricultural Research and Extension Council of Alberta (ARECA) Executive Director Dee Ann Benard, Battle River Research Group (BRRG) Manager Alvin Eyolfson and Lakeland Applied Research Association (LARA) Manager Jay Byer for this successful collaboration.

Effect of Seeding and Fertilizer Rates on Canola and Barley Stand Establishment and Malt Barley Quality

Funded by Reduced Tillage Linkages and Alberta Environmentally Sustainable Agriculture

Written by J. Salvador Lopez and Kelly Zeleny

Introduction

Seeding rate, herbicide application timing and competitive varieties contribute to integrated weed management. Seeding rate, nitrogen rate and nitrogen placement can also effect crop establishment. Optimizing these factors and seeding rates have demonstrated enhanced crop competitiveness to weeds. Among other factors, nitrogen fertilizer and seeding rate may influence grain protein content in barley, which in turns affect the malt quality.

For barley, a plant population of 22 plants/ft² is generally considered the optimum for weed management and yield. However, surveys done in central Alberta found that barley plant stands were often well below 15 plants/ft². This result suggests that the competitiveness of barley grown in Alberta could be increased by raising the seeding rate.

The optimum level of protein for malting barley varieties is between 9.5 and 11.5 per cent. When the levels of protein are between 8.5 and 13 per cent, the grain is received for malting but it is subject to downgrading according to its increments from 8.5 per cent. The concentration of protein in the grain depends on the amount of nitrogen in the plant and how many grains the nitrogen is distributed to. Among other factors, nitrogen fertilizer and seeding rate may influence grain protein content in barley. For canola, variations in seeding rate or plant population over a range of 7 to 17 plants/ft² normally have very little effect on the final yield. Also, over this wide range the crop competes very well with weeds. However, differences in days to maturity may be negatively affected. The effect of seeding rates on maturity is more pronounced in places where the weather conditions are predominantly cool, such as the northern Peace region.

Objectives

- To demonstrate that higher seeding rates can result in more competitive crops, better herbicide efficacy, and greater returns.
- To evaluate the effect of seeding rate and fertility rate on malt barley seed quality and yield.
- To assess the effect of seeding rate on canola maturity and yield.

Materials and Methods

The barley trial was set up as a field scale factorial with two factors and replicated three times. Factor A included four fertilizer rates of NPKS (60-15-16.1, 60-30-15.1, 40-10-10.8, and 40-20-10.1 lbs/ac). Factor B was two seeding rates of barley (88.2 lbs/ac and 132.4 lbs/ac). Plot size measured 60 feet wide by a half a mile long. Direct seeding occurred on May 10 with a Flexicoil air drill with a shank spacing of nine inches and the opener was a paired row of three inches.

In similar fashion, the canola trial was set up as a field scale factorial with two factors replicated two times. Factor A was two fertilizer rates of NPKS (80-25-17.3-14, and 50-25-10.3-8.3 lbs/ac). Factor B was two seeding rates of 3275 Roundup Ready canola (3 and 6, lbs/ac). Plot size measured thirty feet wide and about one mile long. The canola seed was treated with Helix© and seeded on May 24, 2005. The 1000 kernel weight of this seed was 3.74 grams. The laboratory germination test was 100 per cent and the non vigorous germination zero per cent. The canola was direct seeded with a Flexicoil air drill with nine inch row spacing .

Results and Discussion

On June 2nd, a plant count per squared foot was performed on all barley plots (6 samples/plot). At this time the crop was at 2 to 3 leaf stage. The results obtained indicate that the plant emergence average at the seeding rate of 82.2 lbs/ac was 12 plants/ ft², and the seeding rate of 132.4 lbs/ac was 15/ plants/ ft². With respect to the fertilizer rate, the application of 40-10 10.8 had the highest plant population (Fig.1). The high fertility rates showed the lowest plant population, this might be due to the fact that high amounts of fertilizer placed with the seed increase plant mortality. According to the statistical results there was not interaction between fertilizer and seeding rates.

Also on June 9th, a plant count per squared foot was accomplished on the canola trial (6 samples/plot). According to the statistical analysis, there was a negative interaction between fertilizer rate and seeding rate (Fig.2). The fertilizer rate of 80-25-17.3-14 and the seeding rate of 3 lbs/ac of canola had the lowest average plants/ft² (5 plants). The fertilizer rate of 50-25-10.3-8.3 and 3 lbs of canola seeding rate had the highest average plants/ ft² (10 plants).

Upon visual inspection, it was noted that the weed control on both canola and barley trials was

Figure 1: Average number of barley plants/ft²

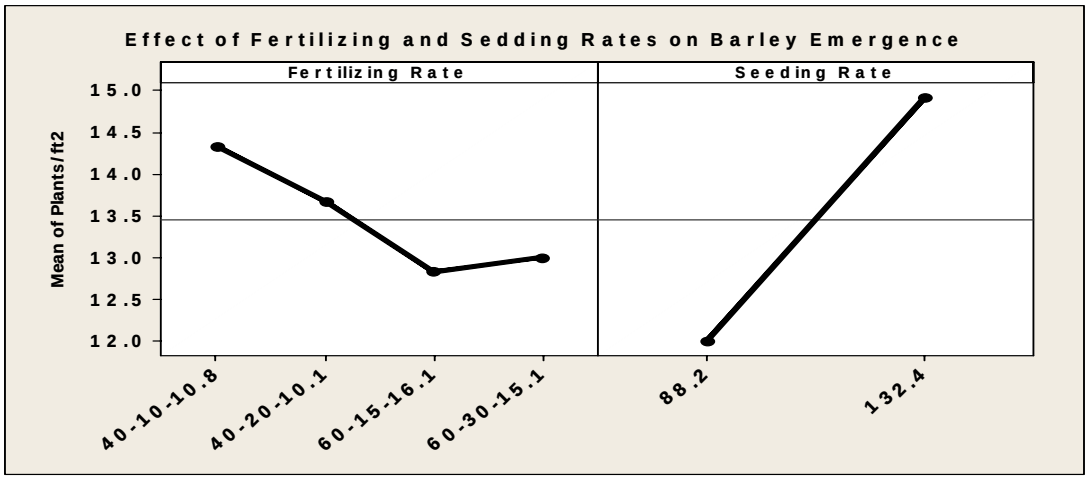


Figure 2 : The effect of seeding and fertilizer rates on plants/ft².

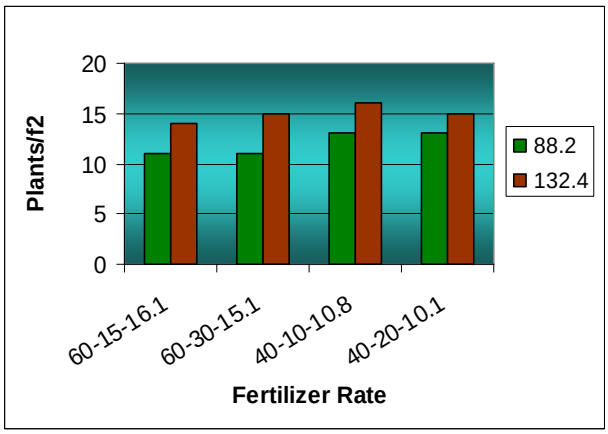


Figure 3: The effect of seeding and fertilizer rates on yield (bushels).

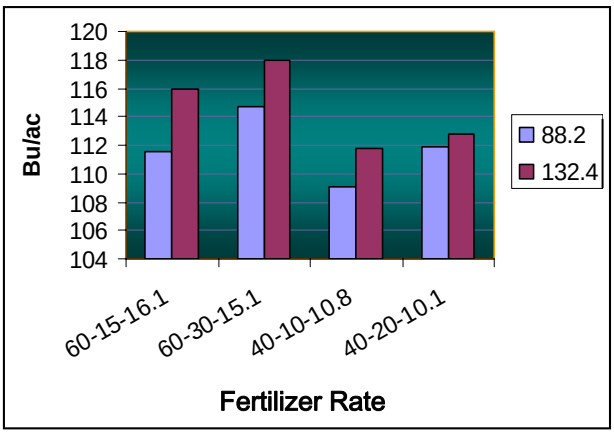
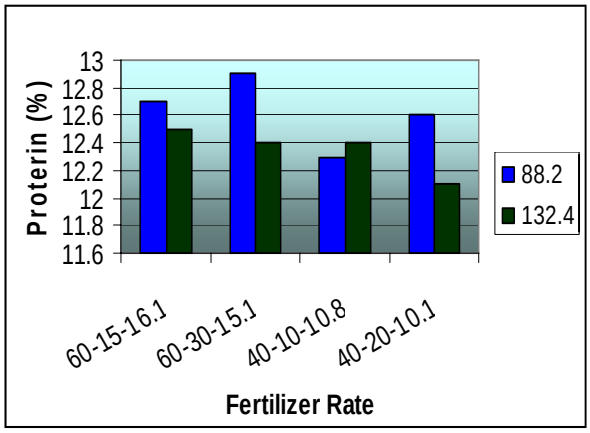


Figure 4: The effect of seeding and fertilizer rates on Protein (%).



excellent and none of the plots displayed lodging problems. Canola growth was monitored over the growing season. Insect pests or diseases were not noted. A difference in maturity was observed when the fertilizer and seeding rate was 80-25-17.3-14 and 3 lbs/ac, respectively.

Figure 5: Average number of canola plants/ft²

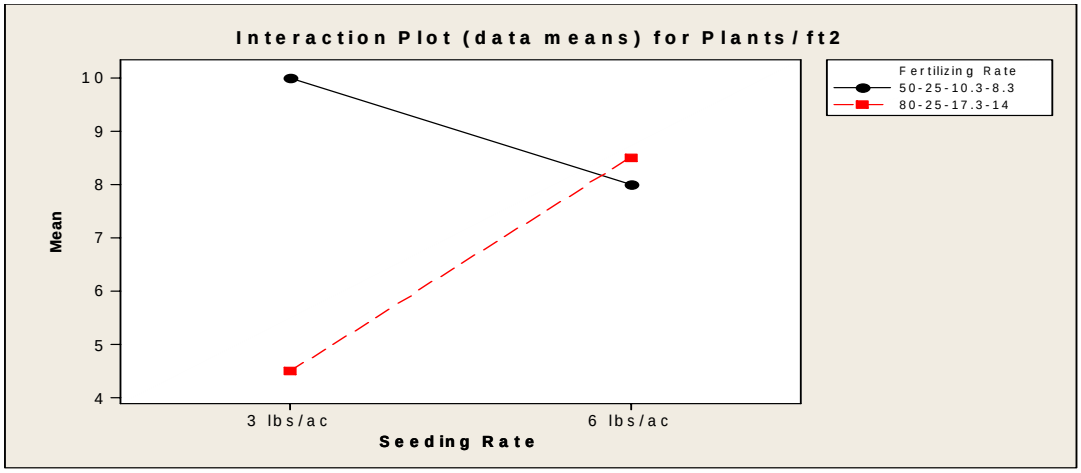


Figure 6: Effect of seeding rate and fertilizer rate on plants/ft².

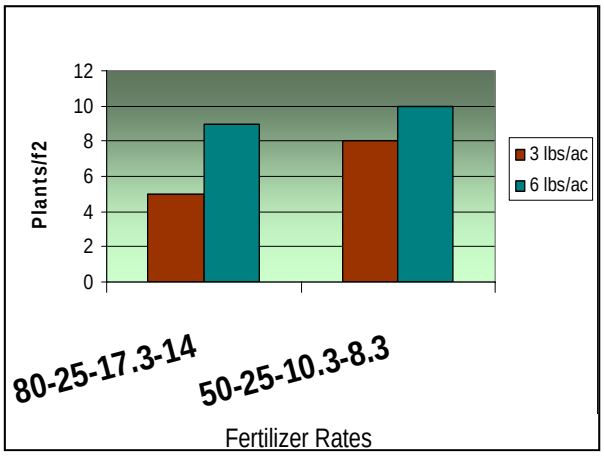
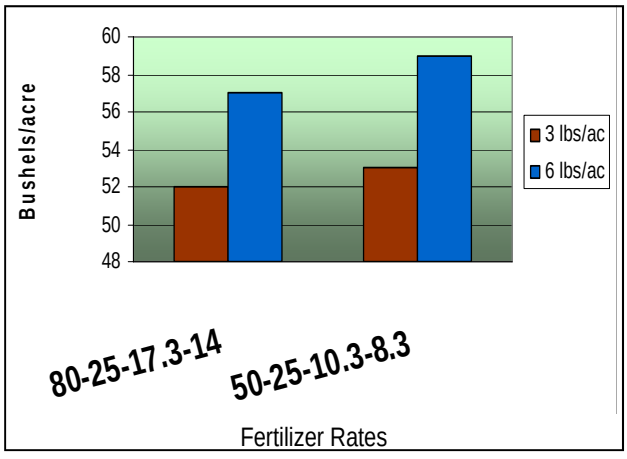


Figure 7: Effect of seeding rate and fertilizer rate on yield (bushels).



Conclusion

Even though the highest fertilizer rate treatments for barley had low plant populations, they resulted in the highest yields. However, this was not evident with canola. When the amount of fertilizer was increased, the plant population was low and the subsequent yields were also low. Placing too much fertilizer with the seed demonstrated a negative effect on canola yields.

Figure 8: Canola Stand Establishment Trial, C. Teichroeb (LaCrete, AB).

Figure 9: Barley Stand Establishment Trial, C. Teichroeb (La Crete, AB)

Winter and Spring Cereals: Alone Versus Intercropping

Funded by Ducks Unlimited Canada

Written by J. Salvador Lopez and Kelly Zeleny

Introduction

Making silage from a cereal or spring-winter intercrop cereal mix is not a common practice in the northern Peace region. This is one approach that local farmers can follow to enhance pasture production. Seeding two crops together in the spring (intercropping) by selecting crops that can utilize different parts of the growing season, a cereal intercropping system ca be created. The mixtures that can be used in such crop system in this region are barley seeded in the spring together with fall rye or winter triticale. The spring cereal is cut for silage usually at shortly after heading (about 65% moisture). After cutting the spring cereal for silage, the winter cereal grows quickly in the absence of competition from the spring cereal. This crop then can be grazed later in the fall.

The high quality of the leaf material from the winter cereals will increase the quality of the silage or green-feed. When allowed to re-grow, the winter cereals will provide a high quality pasture that can be grazed until covered with snow. When grown together, the silage crops may suffer some yield loss but the silage and pasture yields together may show to produce more forage per acre than either one grown separately. In addition, intercropping may reduce winter hardiness due to competition from the spring cereal.

One obstacle of integrating winter cereals into a silage production system in the northern Peace region is the winter survival. Past research done at the AAFC Experimental Farm in Fort Vermilion, AB has shown better winter survival when winter cereals are seeded into stubble, contrary to summer fallow due to reduced growth of snow mold.

Objectives

- To determine if intercropping winter and spring cereals increases overall silage production compared to winter and spring cereals seeded alone.

- To evaluate the impact on winter survival of fall and winter cereals when seeded on stubble vs. summer fallow.
- To evaluate the impact on winter survival when seeding fall cereals alone or intercropped with spring cereals.

Materials and Methods:

This trial was conducted at the experimental farm in Fort Vermilion. The design was a complete block design with two factors and replicated three times. Factor A was the intercropping system with the following components: seeding mixture of barley + fall rye, barley + winter triticale, and spring triticale + fall rye vs. seeding alone spring triticale (AC Alta), barley (Metcalf), winter triticale (Pika), winter triticale (Bobcat), and fall rye (Musketeer). Factor B was seeding on stubble vs. seeding on summer fallow. The intercrop treatments were seeded at ¾ normal seeding rates for each component. The winter triticales, and fall rye were seeded on August 16, 2004. Barley + fall rye, barley + winter triticale, spring triticale + fall rye, spring triticale, and barley were seeded on May 17, 2005. Fertilizer was applied at the moment of seeding at a rate of 63.5 lbs/ac of actual nitrogen and 29 lbs/ac of actual phosphorous. Each plot was 12 feet wide and 30 feet long. In this trial the cereals were cut for silage at about dough stage and yields adjusted to 65% moisture. Weeds were controlled using Buctril M® at the recommended rate. All the plots suffered from severe grass hoppers damage.

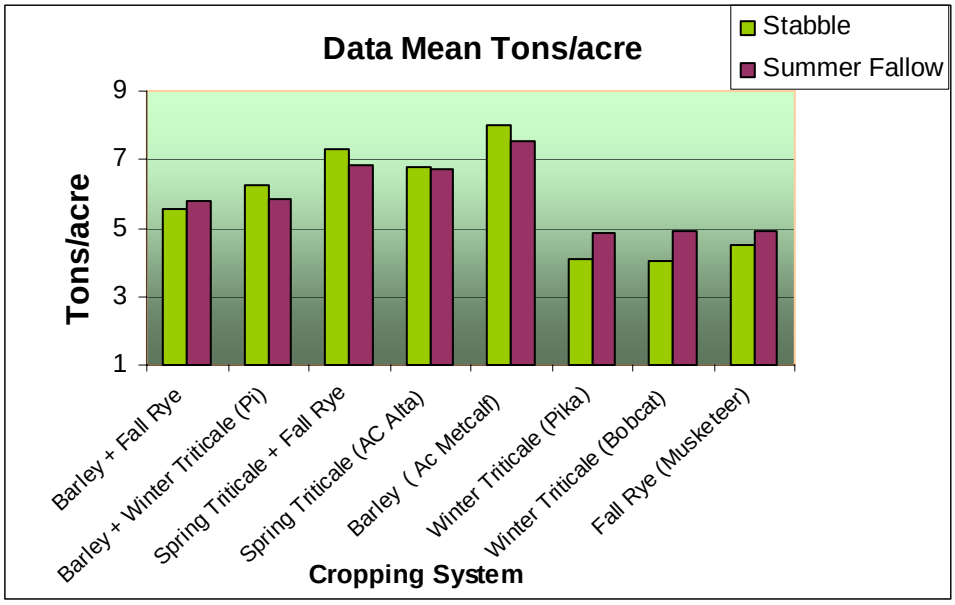
Results and Discussion

As shown in Figure 1, and Table 1 there were significant differences in yield among cropping system treatments. However, there were not significant differences between seeding on stubble vs. seeding on fallow. In addition there was not interaction between cropping system and seeding on stubble vs. summer fallow. Among all the trials barley had the highest yield fallowed by spring triticale + fall rye.

Table 1. Yields of the cereal intercrop vs. alone.

Cropping System	Tons/acre	Stubble vs. Summer Fallow	Tons/acre
Barley + Fall Rye	5.65	Stubble	5.8
Barley + Winter Triticale (Pi)	6.03	Summer Fallow	5.92
Spring Triticale + Fall Rye	7.05	*LSD at 0.05*	*0.79*
Spring Triticale (AC Alta)	6.73	*P value at 0.05*	*0.754*
Barley (Ac Metcalf)	7.78		
Winter Triticale (Pika)	4.48		
Winter Triticale (Bobcat)	4.48		
Fall Rye (Musketeer)	4.71		
LSD at 0.05	*1.58*		
P value at 0.05	*0.0005*		

Figure 1: Yield in Mean Tons/acre on Stubble and Summer Fallow



Conclusion

Intercropping winter cereals with spring cereals enhances forage quality and provides limited quantities of high quality forage that could be used to extend a fall grazing period. However, total silage production was reduced when spring and winter cereals were seeded together compared with seeding spring cereals alone. In these small plots, fall rye produced the lowest amounts of forage as compared with the other cereals in the study.

Winter Wheat Trial

Funded by Ducks Unlimited Canada

Written by J. Salvador Lopez and Kelly Zeleny

Background

For many years, the production of winter wheat has been concentrated in the southern areas of Alberta. Production of winter wheat in the northern areas of Alberta is limited mainly due to its poor winter hardiness and its susceptibility to snow molds.

Objective

- To determine which winter wheat variety (s) perform well under northern Peace Region growing conditions.

Materials and Methods

With seed provided by Rob Graff from AAFC Lethbridge, 14 lines of winter wheat were seeded as a randomized complete block design with 3 replicates on August 16, 2004. Plot size measured 1.22 meters wide by 5 meters long. These lines varied in winter hardiness including an experimental line: SM-8323 which is resistant to snow mold. In spring of 2005, nitrogen and phosphorous were broadcast at a rate of 50 lbs/ac and 25 lbs/ac, respectively. In late April of 2005, winter survival measurements (percentage of plants surviving) were taken. Weeds were controlled with Buctril M herbicide at the recommended rate.

Figure 1: Winter Wheat Variety Trial — Fort Vermilion

Results and Discussion

In this trial winter kill was extreme for most of the varieties and yields were severely affected as shown in Table 1. Data is shown as a percent winter survival score. Since the coefficient of variation is very high for these data, we cannot draw statistical conclusions about the results.

Table 1: Results of 2005 winter wheat variety trial

Variety	Emergence	% Survival	Yield bu/ac
CDC Harrier	21	3	13.3
SM-8323	14	2	16.5
CDC Kestrel	20	10	18.2
AC Tempest	14	4	21.1
McClintock	20	27	12
Norstar	16	15	22.3
AC Bellatrix	13	14	20.2
CDC Osprey	21	23	15.8
CDC Clair	19	32	21.2
CDC Falcon	21	16	20.4
CDC Raptor	20	18	21
AC Readymade	16	10	30.7
Radiant	19	12	34
CDC Buteo	15	13	21.1
LSD at 0.05)	*8*	*18.2*	*22.3*
P Value at 0.05	*0.3832*	*0.0687*	*0.7992*
CV	*27.82*	*76.52*	*63*

Alfalfa Winterkill Assessment

Written by J. Salvador Lopez and Kelly Zeleny

Abstract

Selecting a productive alfalfa variety is one of the most important decision producers can make when developing a good forage production system. Planting high yielding and well-adapted varieties ensure good yields and healthy, vigorous and long-lasting stands. Severe winter conditions in the North Peace region make variety hardiness a primary consideration in variety selection, therefore, varieties with very good winter survival should be strongly considered.

Although more than one year of data should be considered when evaluating the performance of a variety, the alfalfa that yielded the highest (tones/acre) and had the lowest mortality rate over winter (6%) was Algonquin.

Background

The most productive and widely adapted forage species is alfalfa. The decision to produce alfalfa and choose an appropriate variety may have long-term consequences for a producer. There are over 200 alfalfa varieties available in North America and every year this number increases by 20-30 new varieties. Alfalfa is a perennial plant and has been known to live longer than five years. The Experimental Farm in Fort Vermilion recently sod seeded into an Anik alfalfa stand that was estimated at over twenty years of age (plant density was low). Understanding the factors that cause alfalfa losses can lead to higher productivity and stand life expectancy.

<u>Winter Hardiness:</u>

The risk of winterkill increases with increasing age of the alfalfa stand. Younger plants are more stress tolerant than older plants since they have lower disease infestations and have tolerated less physical cutting damage. The lack of insulating snow on a stand will decrease the plant's ability to withstand winter cold stress.

Variety:

Varieties differ substantially in regards to winterkill. Varieties with resistance to disease (bacterial wilt, Fusarium wilt and root rot) and high winter hardiness have reduced chances of winterkill. Consult local variety trials or experienced forage growers when choosing a particular variety to grow in your area.

Soil Potassium Levels:

Soil sampling is recommended for any production management schedule. Fertilizer application (granular or manure) during the growing season is essential. Low potassium levels in the soil have proven to be a major factor leading to alfalfa stand losses. Low potassium levels hinder the storage of carbohydrates in the root and influence the development of a winter hardy plant condition. This is particularly evident on loam and sandy loam soils.

Soil Drainage:

Poor drainage kills alfalfa. Alfalfa on wet soils is more prone to frost heaving during late winter and early spring. Frost will often break the taproot and force the crown out of the ground, subsequently exposing the plant to drying winds, disease and injury during harvest. Surface formation of ice due to excess s moisture will smother plants.

Harvest Management:

Alfalfa stands can be thinned quickly by incorrect harvest timing. Several factors must be considered: stage of maturity at cutting, number of cuts per year and top growth going into winter. Alfalfa roots must store sufficient food (starch and sugar) to survive winter conditions and begin re-growth in spring. Stored food levels drop during the first three weeks of growth until the plant is about 25 cm in height. The plant will have developed enough leaf area to allow more food production. Food surpluses produced by the leaves move to the roots and crown for storage.

This usually occurs at full bloom. To reach high root reserves and maximize survival, at least 25% of the alfalfa stand should reach full bloom before harvest. The conditions in the North

Peace usually allow sufficient plant recovery time after only one harvest. The last 4-6 weeks of the growing period should be reserved as a rest period for the alfalfa stand. This time period usually starts after August 15 (depending on existing climate conditions). As day length and temperature decrease, plants accumulate root reserves, initiate crown buds and develop cold hardiness. These changes increase the plants ability to tolerate stress like adverse weather conditions. Cutting alfalfa in this critical fall harvest period will compromise the stand's survival rate.

Objective

- To identify varieties suitable for the North Peace based on winter hardiness and yield.

Materials and Methods

The trials were seeded as a complete block design with four replicates on June 09, 2004. Seeding depth was 0.5 inches at 20 lbs/ac. 10 varieties (Table 1) of alfalfa seeds were pre-treated with a commercially available inoculant. Plots were direct seeded on barley stable using a 4-row plot seeder. Only three rows emerged due to the fact that one opener was plugged at the time of seeding. Plot size was 6.5 by 2 meters and cut back to 5 by 2 meters to ensure equal area at harvest.

On May 16, 2005 a percentage of plant mortality was estimated using a scale from 0 to 99 %, results on table 1. Odyssey herbicide was sprayed at a rate of 17 g/ac and water volume of 40 L/ac on May 20. Before each forage harvest on July 05 and August 16, samples were obtained from non-border rows of each plot. These samples were taken by hand clipping and dry at about 140 ^{o}F in an oven to calculate the dry matter weight.

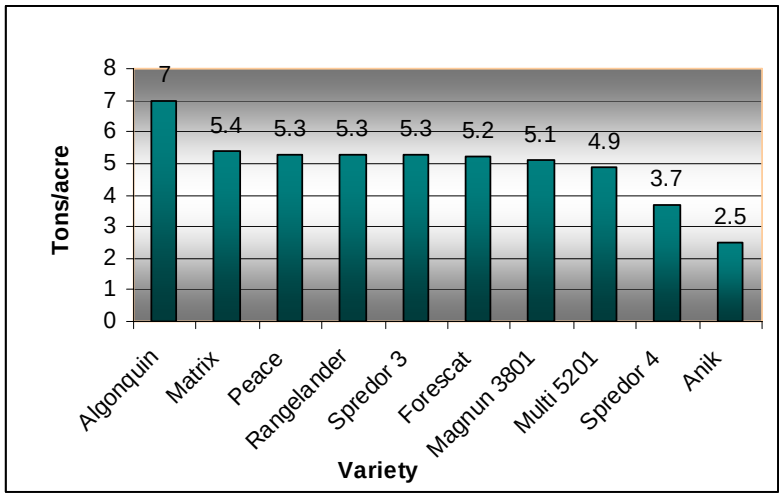
Results and Discussions

Good moisture conditions throughout the growing season of 2005 promoted excellent growth rates for all varieties with the exception of Anik. The results on Table 1 and Figure 1 reveal that Algonquin had the highest yield fallowed by Matrix. In addition, Algonquin had the lowest plant mortality. It was possible to have a second cut for all varieties, except Anik, which, therefore, had the lowest yield. All varieties didn't have any disease, insect, and weed problems.

Table 1: Yield and Mortality Rates of Alfalfa Varieties

Variety	Tons/acre	% Mortality
Algonquin	7	6
Matrix	5.4	9
Peace	5.3	6
Rangelander	5.3	16
Spredor 3	5.3	17
Forecast	5.2	10
Magnum 3801	5.1	17
Multi 5201	4.9	26
Spredor 4	3.7	27
Anik	2.5	24
LSD @ 0.05	1.85	18.7

Figure 1: Yields of alfalfa varieties (tons/acre).



Conclusion

As seen from this year's results, the variety that had performed the best is Algonquin. This study will continue evaluating the performance of these varieties in the future.

Literature Cited

www.agric.gov.ab.ca (Alfalfa Stands and Survival)

www.gov.on.ca (Winterkill and Factors Affecting the Growth of Alfalfa)

www.aginfonet.com (Alfalfa Production in North America)

Strategies to Increase Awareness and Adoption Rate of Environmentally Sustainable Grazing Management

Funded by the Fish Stewardship-in-Action-Program

Written by Kelly Zeleny

Abstract

The primary goal of this program is to increase awareness with respect to the use of riparian areas by livestock. The Municipal District of Mackenzie, located at the northeast end of Alberta is a rich collection of watersheds and corresponding riparian areas. Several producers water their cattle both upstream and downstream of Fort Vermilion which is located on the largest river flowing through this region — the Peace River. It has been an on-going priority of our association to educate producers on the importance of riparian health and riparian grazing management.

The demonstration associated with this project was set up on the pasture lease held by Peter Wieler along the Peace River (SE11-108-14-W5). The initial site groundwork and assessments were conducted in the summer of 2004. The final tour was completed on June 29, 2005.

Background

Beneficial riparian management practices have been part of our applied research program since 2001. This will continue to be an integral part of on-going educational programs that showcase local producers and their remote watering systems. Several collaborative groups such as Cows and Fish, Sustainable Resource Development (SRD-Public Lands) and Prairie Farm Rehabilitation Administration (PFRA) have provided extension activities to local producers at field days, seminars and tours and have been a valuable source of expertise to the ongoing development of providing best management practice tools for producers.

On August 6, 2004 a site assessment was completed at Peter Wieler's grazing lease located on the Peace River. The public had access to this site as a boat launch for previous years and plant damage was noted. A riparian health assessment was conducted with assistance from the local public lands specialist. Ground cover destruction was noted in several places from the ongoing movement of people and cattle to the riverside. Peter had originally watered his herd of cattle

directly from the river and had become concerned about the environmental risks that this had posed for the surrounding riparian area and water quality. He was motivated to change his practices from a previous MARA tour of local remote watering systems. Access to the river was ceased by constructing a wooden fence between the pasture and the river. The floating high volume pump could transfer the water to the tank but displayed difficulty in lifting water over the 46 ft slope.

The Peace River water level decreased substantially over the summer due to the very limited amounts of rainfall in the region. The further the water level moved from the watering system the less efficient the pump became supplying adequate amounts of water for the cattle. By the end of summer, heavy rains in the South Peace caused a sudden rise in the water level. With this came large wood debris and a stronger current that interfered with the pump's efficiency to pull water from the river. Peter had to check this system continually throughout the summer to make sure the pump remained submersed in the river.

Objectives

- Establishing benchmarks as a basis for documentation of riparian site improvements
- Organization of site visits to enhance local knowledge.
- Resource and educational material development.
- Promotion of best management practices with local producers.

Results and Discussion

One of the main goals was to establish a riparian management demonstration site and working with cooperators to develop a plan that corresponds to their specific needs while optimizing environmental and economic benefits. An informal tour with producers and staff was conducted in the end of October on the established site. The water level changes and debris problems interfered with the efficiency of the pump. It was determined that a solution was required to adequately water the cattle through the next season. Modifications to the system in 2005 included:

- Pump upgrade able to handle the steep river bank grade and low river flow
- Larger water holding tank
- Increase in the number of solar panels and better placement of solar panels
- Increase in the number of batteries powering the system (from 4 to 6)

Plant health assessments were completed on the areas from the river to the watering tank and from the watering tank to the pasture with the assistance of a Public Lands specialist. Plant cover increased by 12% in the riparian areas from 2004 to 2005.

Peter Wieler's site was re-visited in late June 2005 during the Kelln Watering System Day Watering system equipment and grazing management in riparian areas was discussed.

Conclusion

There are many fundamentals to good management and education is an important aspect. Learn all that you can about riparian health and management through publications, field tours and seminars. There are several research and extension groups available to provide riparian information. These include Cows and Fish, Prairie Farm Rehabilitation Administration, Sustainable Resources Division—Public Lands and NPARA, to name a few. Take the knowledge and apply it to an improvement program that you can specifically design for your particular riparian area. Note any progress you observe and keep in mind that effects of your changes may take years to document. Long-term sustainability of resources will provide profitability and environmental stability.

Figure 1: Peace River

Figure 2: Watering system setup.

Figure 3: Path leading to water system

Figure 4: Riverbank slope to water system

Figure 5: River side soil erosion

Figure 6: Bare soil from traffic

Maralroot Fertility Trial

Written by Kelly Zeleny

Abstract

Crop diversification opportunities exist for Alberta producers. One of the upcoming crops with good market potential and production in northern climates is maralroot. As often the case with herbs and medicinals, labour is intensive for planting and harvest. Field harvesting methods have yet to be developed and modified to relieve the intense labour involved with harvesting a root crop like maralroot, minimize mechanical damage and increase adaptability in field scale operations.

Background

Maralroot (Leuzea carthamoides 'Lujza') is a hardy plant that can grow up to 5' tall with medium purple flowers. It is a Siberian perennial that has been studied by Russian scientists for its remarkable metabolic and tonic effects. It has been used in the Russian athletic training program for decades. A maralroot plant is grown for at least two years before harvest. Studies have shown that the most optimal time for root harvest, when the desired compounds are at the highest concentration, is the third year of establishment. Studies have also shown that the root extract greatly increases the work capacity of muscles and normalizes blood sugar levels quickly after exertion. It is a potent "adaptogen" that helps athletes increase their endurance, reflexes, concentration, memory and learning. The root extract contains compounds called ecdysteriods which have anabolic-like growth promoting effects with the side effects and legal issues associated with drugs.

Objectives

- Improve fertility of maralroot through granular application of phosphorus

Material and Methods

The maralroot plants used in this trial were started from seed and germinated in standard six-pack plug trays by Gordon Steinraths with the Alberta Natural Health Agricultural Network . The plug trays were transported from Barrhead, AB in the beginning of July by pickup truck. Some of the leaves received slight wind damage at this time. Soil samples were taken on the planned trial site and nutrient analysis indicated that phosphorus, potassium and sulphur levels were optimum while the nitrogen levels were rated as marginal.

On July 8, 2004 the maralroot plugs were transplanted into a randomized complete block design of eight replicates (Figure 1) on the Experimental Farm in Fort Vermilion. Care was taken not to break the large plant root in the trays. Two lines of maralroot per row were planted, with in-row spacing of 0.5 m between the plants. Each plot was measured at six meters in length by one meter in width for a total trial area of 660m² (including alleyways). Irrigation with drip hose was started immediately and continued every 3-4 four days throughout the 2004 growing season. Irrigation was not applied during the 2005 growing season.

The trial was fertilized according to treatment by a granular broadcaster on July 22, 2004 and July 21, 2005. Field observations were continued through the summer for growth, insects and moisture conditions.

Table 1: Maralroot Randomized Complete Block Design

B	C	B	Control	C	A	Control	C
C	B	A	C	B	Control	D	B
D	Control	D	A	Control	B	C	A
A	A	Control	C	D	Control	B	D
Control	D	A	B	A	D	C	D

Table 2: Maralroot Treatments (lbs/acre)

	Pounds 11-51 (Applied)	**Pounds 11-51 (Actual)**	**Pounds 46-0-0 (Applied)**	**Pounds 46-0-0 (Actual)**
Control	0	0	0	0
A	20	10	85	40
B	40	20	85	40
C	60	30	85	40
D	80	40	85	40

Table 2 outlines 5 treatments: Control, 40 lbs/acre actual nitrogen + 10 lbs/acre actual phosphorus, 40 lbs/acre actual nitrogen + 20 lbs/ acre actual phosphorus, 40 lbs/acre actual nitrogen + 30 lbs/acre actual phosphorus and 40 lbs/acre actual nitrogen + 40 lbs/acre actual phosphorus.

Results and Discussion

The maralroot plants have grown from average heights of 23-27 cm (2004) to 42-48 cm (2005). In the 2004 growing season, the plants recovered from wind damage during transport and flea beetle pressure early in the spring. During 2005, insects, plant damage or disease were not observed.

Winter survival of the plants is scored as excellent. Less than 0.5% mortality was noted in the trial over two winter seasons.

Figure 1: Maralroot plant two weeks after transplanting.

Figure 2: Maralroot row displaying block design and trial layout.

Irrigation with drip hose saturated the soil at a slow rate every 3-4 days. The 2004 growing season was extremely dry and temperatures reached the high twenties (°C) during the afternoons, so the plants were watered in the early morning to avoid subjecting them to more environmental stress. Field observations did not note any visual differences in plant growth between the treatments in either 2004 or 2005.

Conclusion

The plant roots are scheduled for harvest in 2006.

Literature Cited

www.richters.com
www.newcrops.org

Alberta Environmentally Sustainable Agriculture (AESA)
Farm Based Program

Municipal District of Mackenzie #23
Rural Extension Staff: Kelly Zeleny

The AESA program consists of four components:

1) Nutrient Management

- To decrease nutrient loading with respect to commercial fertilizer and manure application through the adoption of nutrient management plans, specifically manure management plans and VRT.
- To increase environmentally sustainable fertility management by creating interest, awareness, and understanding of key management principles associated with site-specific fertility.
- To raise awareness and to increase adoption rates with respect to manure and soil testing.
- To increase the use of inoculants to reduce fertilizer requirements and demonstrate their ability to make previously unavailable soil nutrients available for plants.

2) Grazing and Riparian Management

- To increase the number of producers who have grazing plans to enhance pasture productivity by preventing over grazing and increase the number of producers' soil testing and fertilizing their pastures.
- To demonstrate the benefits of biodiversity in riparian areas.
- To decrease detrimental effects of livestock on riparian areas.
- To increase awareness and interest in vegetation and woodlot management in riparian areas and to demonstrate integrated land use.

3) Integrated Crop Management

- To improve soil quality by having producers do more soil testing, increase crop diversification, use more forage on sensitive slopes, marginal, and riparian areas, and decrease the amount of conventionally tilled summer fallow.
- To decrease unnecessary pesticide use and improve herbicide rotations by educating farmers on economic thresholds and timing.
- To increase awareness and interest in biodiversity and conversion of marginal land through the establishment of managed woodlots.

4) Environmental Farm Plans

- The goal of the program is to move producers along the extension value chain from awareness to adoption with respect to the Environmental Farm Plans.

In addition to our farm calls, a survey was completed in 2005 to establish benchmark data and guidelines for employees to evaluate program adoption by the end of 2007.

Environmental Farm Plans

1a) Have you heard of the AEFP program?
Yes, **41%** (61 out of 150) **No**, **59%** (89 out of 150)

1b) If yes, are you interested on the AEFP program?
Yes, 56% (34 out of 61)

1c) Have you applied anything from the AEFP program to your operation?
Yes,41% (14 out of 34) applied to funding

1d) If no, why aren't you interested in the program?
No, 44% (27 out of 61) - no reason and no time

2) If you haven't heard of AEFP, would you like to have more information?
Yes, 47% (42 out of 89) are willing to get more information

3) Are you aware that the program is completely free to attend workshop?
Yes, 38% (57 out of 150) **No,62%** (93 out of 150)

4) Are you aware that by taking this program you could save and make your farm efficient?
Yes, 33% (49 out of 150) **No, 67%** (101 out of 150)

Nutrient Management

1a) Do you test manure? **Yes, 9%** (3 out of 32)
1b) If no, why not? **Reason**– no time and don't know I had to

2a) Do you soil test? **Yes, 77%** (116 out of 150)
2b) If no, why not? **Reason**-costly, time consuming, irregular results

3a) Have you considered doing a nutrient management plans for your field?
Yes, 52% (78 out 150) are considered doing NMP.

3b) If no, why not? **Reason**-expensive, no time, no reason, never came up.

4) When do you fertilize your field? (Fall , Spring and both)
Spring, 79% (119 out of 150) **Both, 21%** (31 out 150)

5a) Do you know what the economic threshold of insects are for applying insecticides?
Yes, 57% (86 out of 150)

5b) Do you just spray or do you call someone to assess the age of the insects?
Just spray, 39% (52 out of 133) **Call someone, 61%** (81 out of 133)

6) Do you feel that you could use less fertilizer or pesticides to maintain the same yields or low insect populations? **Yes, 15%** (23 out of 150)

7) Do you regularly use any crop inoculants? **Yes, 32%** (48 out of 150)

Grazing & Riparian Management

1) Do you know what riparian means? (the area between the water and the surrounding upland) **Yes, 13%** (20 out of 150) **N/A, 69%** (104 out of 150)

2a) Are your livestock being pastured by large bodies of water?
Yes, 59% (27 out of 46)

2a) If yes, do you water your livestock through a watering system so that they can't directly access the water?
41% (11 out 27) use water system

2c) If no, why aren't you using a watering system?
Reason - costly, no reason

3) Are you aware of disadvantages that are created by allowing livestock direct access to the water? **Yes, 87%** (40 out of 46) are ware of disadvantages

4) Do you find that your pasture appears to be over grazed?
Yes, 41% (19 out of 46) have overgrazed

5) Do you pasture your livestock where it is mostly wooded area?
Yes, 50% (23 out of 46) pasture livestock in wooded area

Integrated Crop Management

1) Do you diversify your crops in Adequate crop rotations?
Yes, 95% (142 out of 150)

2) Are you familiar with the Chemical Blue Book?
Yes, 75% (112 out of 150) **No, 25%** (38 out of 150)

3) Do you use this book?
Yes, 62% (93 out of 150) **No, 38%**

4) Do you pesticides/insecticides/fungicides on your crop?
Yes, 87% (130 out of 150) **No, 13%**

5) Who do you contact for management question or product information?
P&H - 22% **UFA - 16%** **Mike Hall - 10%**
Agricore - 7% **Elevator - 7%** **Neufeld Petroleum - 4%**
Agronomist - 2%

6) How many acres do you summer fallow each year on average?
0ac - 45% **<100ac - 20%** **<200ac - 9%**
<300ac - 7 % **more than 1000 ac - 2%**

7) Do you grow perennial crops? **Yes, 51%** (76 out of 150) **No, 49%**

8) If yes how many acres?
<100ac - 11% **<200ac - 16%** **<300ac - 6%** **<400ac - 4%**
<500ac - 6% **more than 1000ac – 8%**

9) What kind of crops do you grow?
Grain 77% **Forage 10%** **Pea 11%**

10) Do you use GPS or are you interested in GPS application to your production?
Yes 23% **No, 55%** **Interested 13%**

Agroforestry

1) Are you familiar with the term Agroforestry?
Yes, 54% (89 out of 150) **No, 46%** (69 out of 150)

2) Are you familiar with the term Silvipasture?
Yes, 9% (9 13 out 150) **No, 91%** (137 out of 150)

3) Are you familiar with the term Strip Grazing?
Yes, 67% (101 out of 150) **No, 33%** (49 out of 150)

4) Are you familiar with the term intercropping?
Yes, 66% (99 out of 150) **No, 34%** (51out of 150)

5) Do any of these apply to your operation?
Intercropping, 32% (49 out of 150) **Strip Grazing, 14%** (21 out of 150)

Other

1a) Have you ever heard about MARA events/seminars/field tours?

Yes, 76% (114out of 150) **No, 24%** (36 out of 150)

1b) If yes, from where? (Radio, mail-out, word of mouth, other advertising)

Radio - 30% **Neighbor - 25%**
Newspaper - 8% **Getting call - 7%**
Posters - 4% **Mailout - 1%**
None of them - 25%

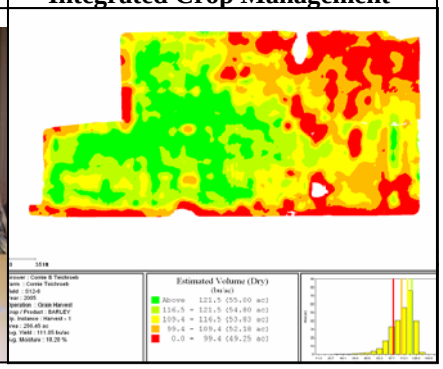
2) Are you interested in being added to the MARA contact list for upcoming events, workshop, field days or seminars?

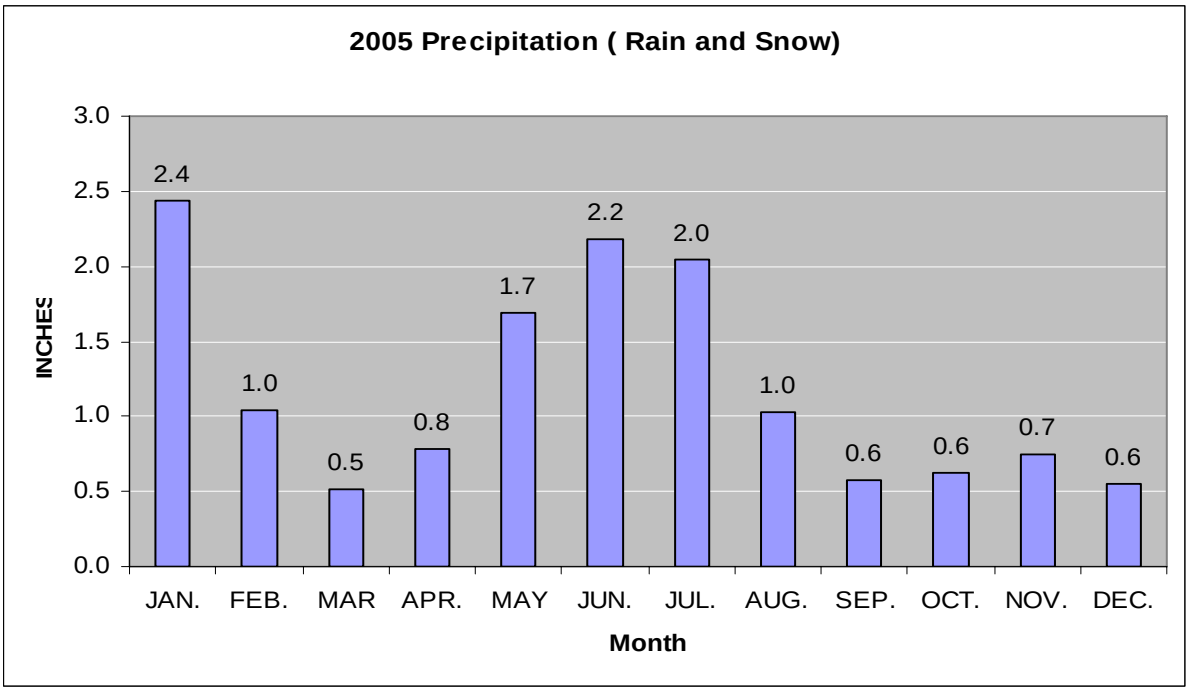
Yes, 43% (64 out of 150) **No, 57%** (85 out of 150)

3) Are you interested in an MARA staff farm call to discuss management question and concerns?

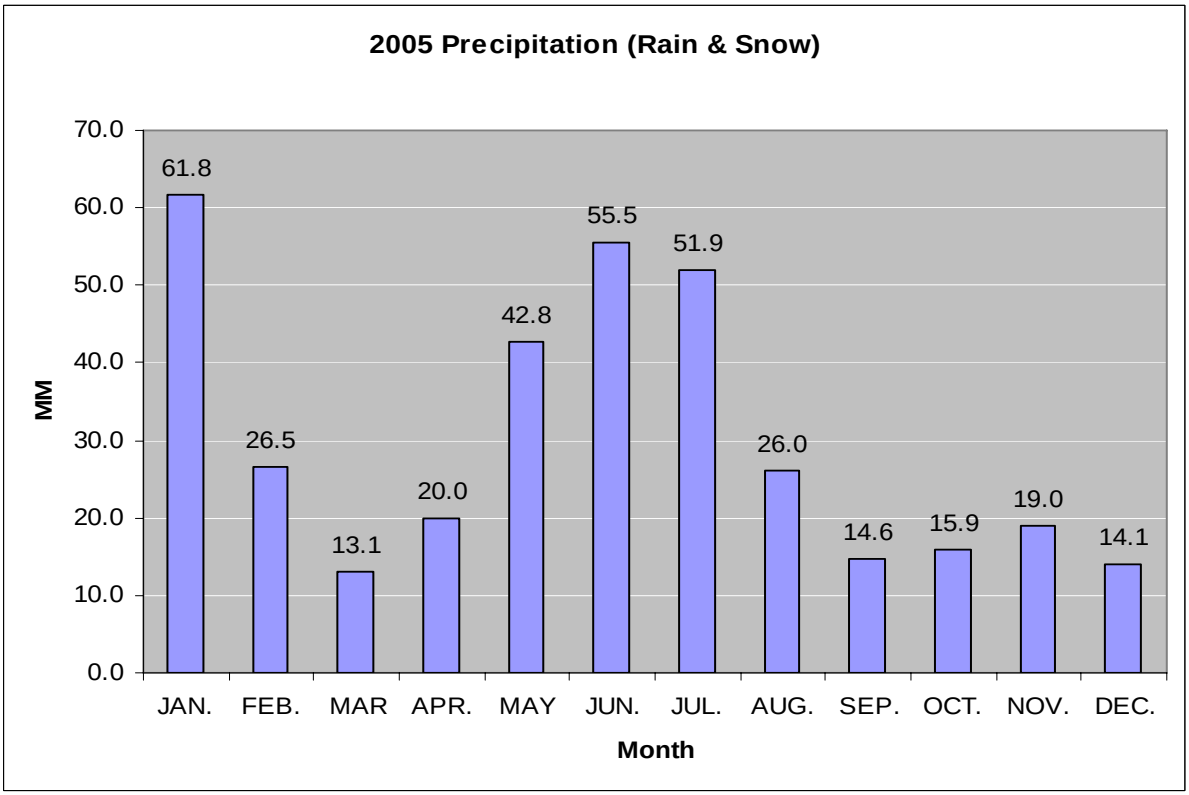
Yes, 29% (44 out of 150) **No,71%** (106 out of 150)

Note: Some of the survey numbers may not add up to 100% due to some answers being N/A or not applicable.

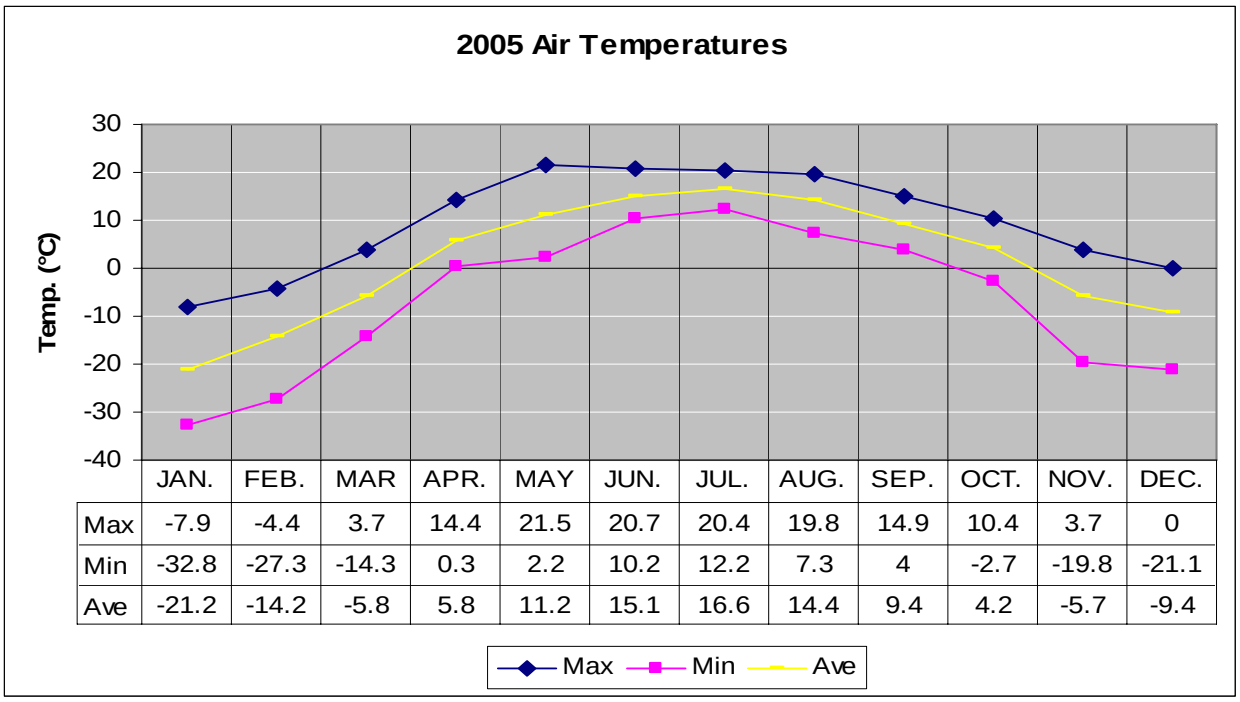
Riparian Management	Integrated Crop Management	Pasture Management
Nutrient Management	**Environmental Farm Plans**	**Integrated Crop Management**
		



Total precipitation is 14.22 inches in 2005. AAFC Fort Vermilion.

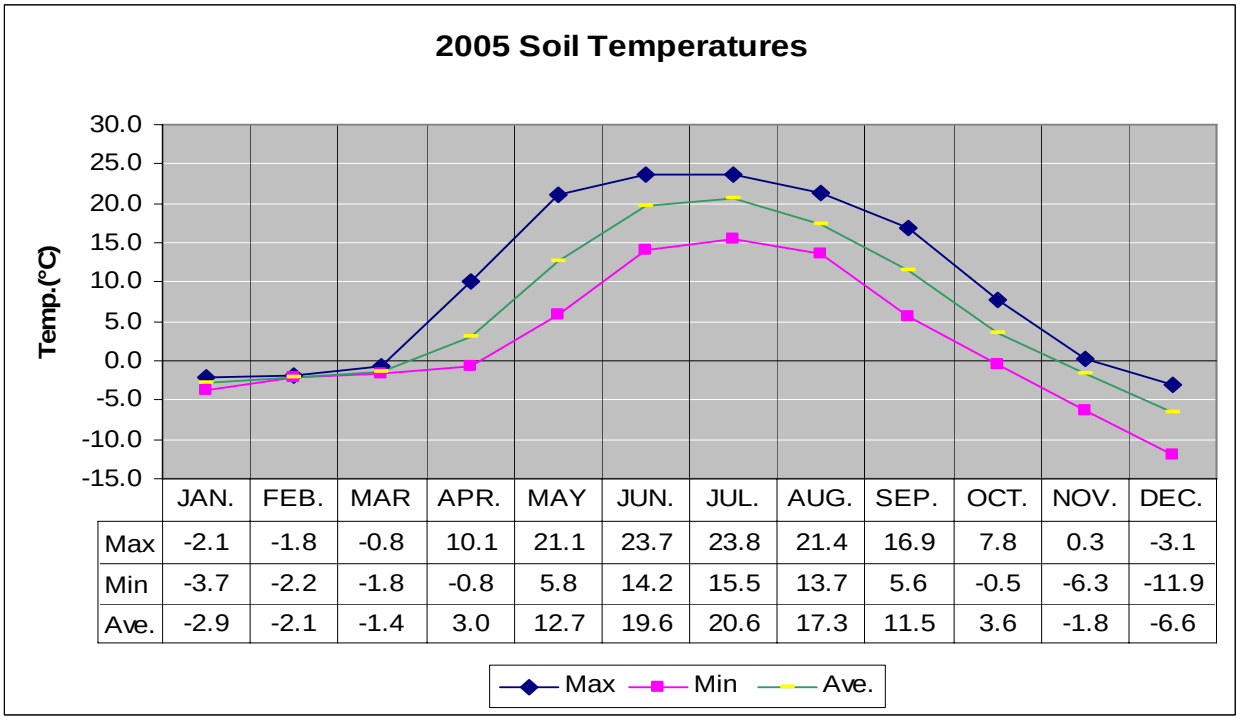


Total precipitation is 361.2 mm in 2005. AAFC Fort Vermilion.



	JAN.	FEB.	MAR	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.
Max	-7.9	-4.4	3.7	14.4	21.5	20.7	20.4	19.8	14.9	10.4	3.7	0
Min	-32.8	-27.3	-14.3	0.3	2.2	10.2	12.2	7.3	4	-2.7	-19.8	-21.1
Ave	-21.2	-14.2	-5.8	5.8	11.2	15.1	16.6	14.4	9.4	4.2	-5.7	-9.4

(Max, Min and Ave. are mean temperature)



	JAN.	FEB.	MAR	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.
Max	-2.1	-1.8	-0.8	10.1	21.1	23.7	23.8	21.4	16.9	7.8	0.3	-3.1
Min	-3.7	-2.2	-1.8	-0.8	5.8	14.2	15.5	13.7	5.6	-0.5	-6.3	-11.9
Ave.	-2.9	-2.1	-1.4	3.0	12.7	19.6	20.6	17.3	11.5	3.6	-1.8	-6.6

(Max, Min and Ave. are mean temperatures).