Mackenzie Applied Research Association

2006 Annual Report

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The 2006 Annual Report is dedicated to the memory of Andrea Vavrek.

Andrea was the former NPARA Research Coordinator / AESA Rural Extension Staff (MD 22). She was a collaborative partner with MARA on the 2006 Diagnostic Field School, Farm Safety Day, Rancher Days, Nutrient Management workshops and AESA program.

Andrea was fatally injured while on the job on January 3, 2007 and passed away on January 8, 2007. Her gift of organ donation has helped more than 80 people have a better quality of life.

Andrea's enthusiasm, sense of humor and expertise will be missed.

Andrea Jean Vavrek

1981-2007

Table of Contents

2006 MARA Staff……...Page 3
2006 Board of Directors…… Page 4
Acknowledgements…….……... Page 5
Presidents Message……. Page 8
Research Coordinator's Message……... Page 9
ARECA…….. Page 10
ARECA 2006 Board of Directors……... Page 11
Crops Team Summary…… Page 11
Forage/Livestock Team Summaries……... Page 12

Extension
Farming North Of 58° Newsletter & Radio Show……Page 14
2006 Events Summary……..……. Page 15

Crops Program
Regional Variety Trials: Cereals, Flax and Field Peas…….. Page 26
Prairie Canola Variety Trials: Fort Vermilion…… Page 34
Barley Seed Treatment Evaluation…….…… Page 38
Alberta Pest Survey…….Page 40
Effect of Seeding & Fertilizer Rates on Canola and Barley Stands….. Page 41
Winter Wheat Trial……. Page 45
Alternative Crop Choices: Growing Sunflower……..... Page 46

Forage & Livestock Program
Alfalfa Winter Hardiness Trial…..……. Page 48
Corn for Silage in Northern Alberta……... Page 53
Reducing Cattle Wintering Costs—Swath Grazing……... Page 59
Best Management Practices (BMP) for Riparian Areas…….…… Page 60

Mercury Deposition Sampling……... Page 61
2006 Precipitation…….……. Page 62
Notes from Other Trials……. Page 63
AESA Farm Based Program Summary……. Page 66

Appendices
Hard Red Spring Protein Summary…… Page 67
Utility Wheat Protein Summary……. Page 68

Mackenzie Applied Research Association

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

Our Mission

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

2006 Staff

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Research Coordinator
AESA Rural Extension Staff

Satoru Nosho
Research Technician

Janey Martens
Research Technician

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ACKNOWLEDGEMENTS

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

LOCAL COOPERATORS

Tony Batt
Henry Freisen
Frank Martens
Cornie Teichroeb
Roger Toews
Larry Wieler
Ron Wieler
Peter Wieler

MACKENZIE COUNTY

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Jason Cathcart (Soil Conservation Specialist/AESA Soil Quality Coordinator)
Cathie Erichsen-Arychuk (Pasture Specialist)
Grant Lastiwka (Pasture Specialist)
Doug Macaulay (Woodlot Specialist)
Scott Meers (Integrated Crop Management Specialist)
Raelyn Peterson (Farm Safety Coordinator)
Trevor Wallace (Project Leader, Nutrient Management Strategy)
Fred Young (AOF Coordinator)

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Colleen Nate

CIAM RADIO

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Phil Peters
Kevin Wiebe
James Neufeld

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Gary Telford (Soil Resource Specialist)

PROGRESSIVE FARM SAFETY

Holly Brownlee (Winnipeg, Manitoba)
Susan J. Reynolds (Birmingham, Alabama)

PIONEER HYDRID LTD.

Blaine Calkins
Loren Bojarnski

NATURAL RESOURCES CONSERVATION BOARD

Doug Beddome
Vince Murray

OTHER INDUSTRY GROUPS

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

REDUCED TILLAGE LINKAGES (RTL)

Peter Gamache
Nick Underwood

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Parrish and Heimbecker (La Crete)
Pick Seed
UFA (La Crete)

AGRICULUTURAL RESEARCH AND EXTENSION COUNCIL OF ALBERTA (ARECA)

Dee Ann Benard
Gayah Sieusahai
Joy Vonk

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

ALBERTA ENVIRONMENTALLY SUSTAINABLE AGRICULTURE (AESA)

Dale Chrapko Randy Perkins
John Zylstra

ALBERTA SUSTAINABLE RESOURCES DEVELOPMENT PUBLIC LANDS — FORT VERMILION

Sonja Raven

CANOLA COUNCIL OF CANADA

Raymond Gadoua

President's Message

Change. It's the one thing as farmers and an Applied Research Association that we seem to be certain of having. We have completed our division of assets from NPARA which is a big change for both organizations. This gives us a very healthy balance sheet to make improvements with in the future. We fixed up our office in the duplex at the Experimental Farm and were also able to buy a tractor and some other needed equipment this year. We will endeavor to put our capital to good use.

On our farms we have also seen a pleasant change this year with prices heading is a favorable direction and decent yields. Yet, we need to not forget about research when things look good as we know that the better things look, the greater becomes the potential to change. With this in mind we need to keep looking into new potential crops and how to keep as wide as possible the bottom line in our operation. This is where MARA can help us by looking into and documenting new crops, varieties and ideas. I hope you as farmers will continue to use MARA to try new ideas with as cooperators so that we can be prepared for the next downturn. There is a tremendous technological change taking place, yet the more it changes the more it is the same. As in earliest days of agriculture we take the energy of the sun, moisture and nutrients from the air and soil to produce something that is useful to us.

I would like to especially thank our research coordinator for all of her efforts in keeping the program going and our members, M.D., government and member cooperators for their important contributions to MARA.

May the Lord bless us again in 2007.

John Simpson

Research Coordinator's Message

Our association went through many changes this past year and the MARA board has been excellent to work with through it all. On February 21, MARA became legally incorporated in Alberta. The additional paperwork was exciting to get through on the way to becoming independent from NPARA. MARA was invited to feature a farm report on the Weekend Magazine with CIAM radio. *Farming North of 58°*, is a ten minute, local agricultural information update that takes its name from the MARA newsletter. In 2006, our newsletter changed format and this has been successful from the amount of feedback received.

At the ARECA AGM in March, former Agriculture minister Doug Horner personally announced that ARECA member associations would be receiving a capital grant from the provincial government. The result of this was due in large part to the efforts of Dee Ann Benard, Executive Director and Debra Lozinski, ARECA Chair, who along with some association members have been proactive in working with the government to potentially increase our core funding in the Agriculture Opportunity Fund (AOF). The capital fund was appreciated but some ARECA groups have been still struggling to cover their core (wages, office and utility) costs. MARA put use to this money by purchasing equipment and completing office upgrades. I completed another term on the ARECA Executive and Board as a Director. My involvement with ARECA has proven to be rewarding in regards to research project collaborations, peer support, training and funding.

Satoru Nosho joined MARA as a Research Technician from the University of Lethbridge Co-op program for one year. A special thanks for his contributions to the Annual Report. He returned back to his studies in December 2006. Janey Martens joined MARA as a Research Technician from May-September 2006 and brought her horticultural background forward in planning a successful Gardening Conference in La Crete. I am also appreciative for the expertise and collaboration received from the late Andrea Vavrek. Her sense of humor and enthusiasm made program planning more fun. As we look ahead to the coming year I would like to welcome Nora Paulovich as manager to NPARA—they l remain our main research and extension collaborative partner.

My position continues to be challenging with the workload and staff training and I strive to have a program in place that is relevant to local producers. Become involved with MARA—knowledge is a powerful tool and there is a wealth of information to be shared through our programs. In exchange for research funding from the provincial government, MARA has to provide documentation of our *impacts* to agriculture in this area. Most of us understand how important farming is but if we continually need to prove how important agriculture and agriculture research is to the provincial government, then let's get it done together! Drop us a message and we will stop by on a farm call.

Thank-you to Joe Unruh and crew for all their help with equipment and land use planning. This year marks the 100th Anniversary of the Experimental Farm—join us on August 2, 2007 for an event of the century!

I appreciate that Tony helps out when I am forever short of hours and the patience of little Jessie for making monitoring plots and chasing bugs so enjoyable!

It is always a privilege to work with our program contributors, board of directors and producers.
Enjoy agriculture and enjoy life.

Kelly Zeleny

Agricultural Research and Extension Council of Alberta (ARECA)

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

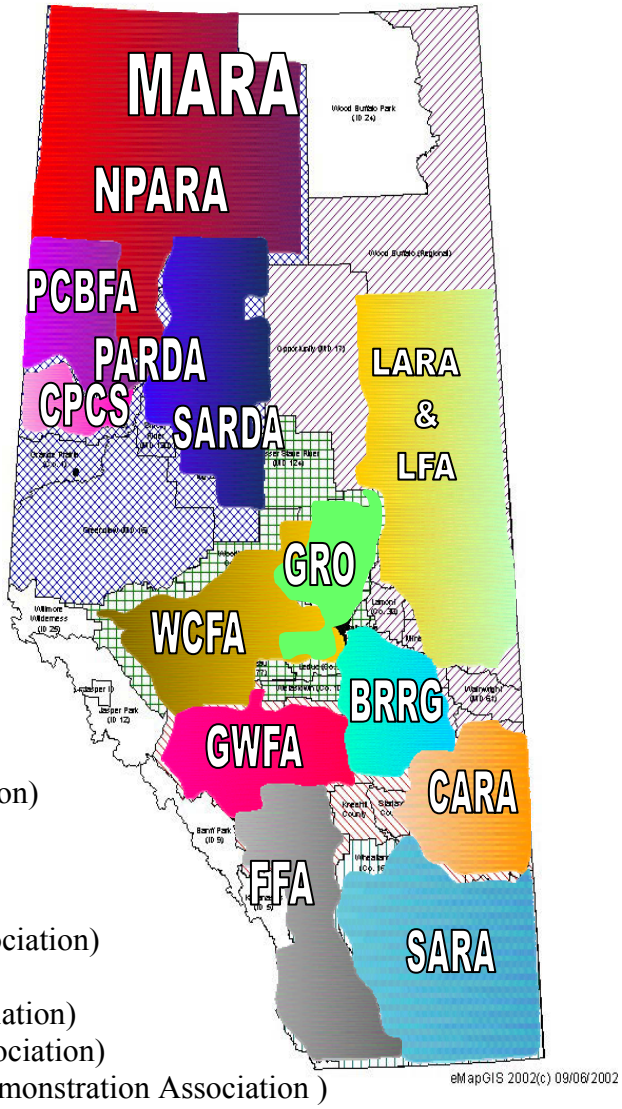
Mission
- Represent members on a provincial level.
- Coordinate resources and activities.
- Enhance communication and extension between producers, researchers, industry and government
- Facilitate efficient growth of agriculture communities in Alberta.

Dee Ann Benard, Executive Director

Joy Vonk, Executive Assistant

Gayah Sieusahai, Crop Program Manager

Grant Lastiwka, Forage Program Manager



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

ARECA 2006 Board of Directors

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Richard Fritzler	Director	SARA	calvin12@telus.net

2006 ARECA CROP TEAM HIGHLIGHTS
Alvin Eyolfson, Crop Team Chair

The ARECA Crop Team helps facilitate the development of joint projects or initiatives. A major challenge in 2006 was to find new sources of funding. Several associations were successful in accessing project funding through the Environmental Sustainable Agriculture Initiatives Programs (ESAIP), administered by ARECA. Currently, the Crop Team is in the process of panning several Energy Reduction workshops for 2007. As well, some of the other joint projects funded by ESAIP include: the Economic Benefits of Using Compost as a Fertilizer in Northern Alberta, Nutrient Management Practices in Agriculture, and Field Monitoring for Early Detection of Glyphosate Resistance (with the Alberta Research Council).

In 2006, ARECA received funding through the federal Pesticide Risk Reduction Strategies Initiative for "Accelerating the Adoption of Intergraded Pest Management and Risk Management Strategies in Wheat and Other Cereals". The first portion of this project was completed in December 2006. Nearly 300 producers from across Alberta were contacted to take part in a 15 minute telephone survey on this topic. Results have now been compiled and will be used in the development of the future projects and extension.

The Mackenzie Applied Research Association, Gateway Research Organization, and the Battle River Research Group found coordinated sites for the Canola Stand Establishment Demonstration project funded by the Alberta Canola Growers and coordinated by Reducing Tillage Linkages (RTL).

These sites are valuable extension tool and a report was complied by Roger Andreiuk of RTL, which is also an associate member of ARECA.

The Variety Testing Program is a major program component of several associations. In 2006, for the first time, this program was coordinated by ARECA. Gayah Sieusahai, ARECA Crop Program Manager, coordinates this program as he had in the past for AAFRD. Of concern is that the funding for the continuation of this program was a one time grant from AAFRD and new support will have to be found to continue this program. Consultant Keith Briggs has been contracted to work towards developing a prairie wide testing program, which hopefully will attract more funding. The associations involved in this program are anticipating a successful outcome.

Our associations are heavily involved in the monitoring of different pests. Bertha armyworm and diamond back moth traps were erected in the spring. Luckily, diamond back moths did not prove to be a problem in 2006, and bertha armyworms were on the decline. Groups also collected wheat samples for Fusarium headblight testing. Additional support from local counties helped support this survey in many cases. Other surveys conducted included: cabbage seed pod weevil, wheat stem sawfly, cutworm, pea leaf weevil, club root on canola, and grasshoppers.

Looking back at spring of 2006, producers had difficulty in making their cropping plans as priced outlooks looked poor for all crops. In the end the majority of producers opted for wheat and canola, which were the best of bad choices in the spring. Narrow rotations are a concern in many areas. This outlook has changed through the summer and fall with the biofuel market making demands on corn in the US and canola in Europe. Producers are now a lot more optimistic about the future.

Paul Jungnitsch, manager of Southern Applied Research Association (SARA), left in December to complete his Masters in Agriculture Science thesis. We wish Paul the best of luck with this challenging task, and welcome Ken Coles manager. We also welcome Nora Paulovich, the new NPARA Manager.

The ARECA Crop Team wishes you a successful 2007 crop year. The members of the 2006 Crop Team were: Alvin Eyolfson (BRRG), Audrey Bamber (CARA), Amy Kaut (GRO), Garry Ropchan (CPCS), Vance Yaremko (SARDA), Kelly Zeleny (MARA), Jay Byer (LARA), Paul Jungnitsch (SARA), Andrea Vavrek (NPARA), Gayah Sieusahai (ARECA), and Dee Ann Bernard (ARECA).

2006 ARECA LIVESTOCK / FORAGE TEAM HIGHLIGHTS

Albert Kuipers, Forage Team Chair & Amber Havens, Livestock Team Chair

Wow! The past year was extremely busy for the Livestock and Forage Teams. We hold regular conference calls which had improved the overall impact of the teams. It seems that our agenda grows larger each time we meet. Many of the items on the Livestock and Forage Team agendas overlap and the group decided to hold conjoint meetings. This works really well and provides the team with a dynamic group of individuals with a lot of experience and great ideas.

Year Round Grazing Demonstrations

Overall, the five year round grazing demonstrations were a provincial success. Each and every demonstration site across the province hosted a group of producers who are trying extended grazing techniques and several who are not. The number of producers who participated throughout the province were more than first anticipated, which testifies to the fact that producer to producer interaction is very well received. The five participating cooperators are an excellent example of producers who are cutting their overall feeding cost through various methods of extending their grazing season. The issue of lowering production costs is a provincial concern and this project was an invaluable method for passing on information from the research community, industry, and other producers. This type of extension project assists producers in putting together a grazing plan that encompasses all of the different BMP practice. The results of this project are still being realized across the province. Each of the cooperating associations continued to receive injuries about how to extend the grazing season and reduce input

costs. When producers are asked what the top three input costs are for their operations, they most often respond fuel, fertilizer and feed. This project encompasses all of those issues and provides an economically and environmentally feasible solutions.

Another round of founding was applied for through Greencover Canada Technical Assistance program and was approved. We requested funding to extend the time for data collection, which will provide more focus on the end-project, the cattle. We would also like to target a new audience at the Western Canadian Grazing Conference by having the Year Round Grazing demonstration project showcased there, as well as to develop producer handbooks, which highlighted the five cooperators and provided some information on how to extend your grazing season.

The producer handbooks were launched in December at the Western Canadian Grazing Conference. There were 3000 copies printed and all of them have been distributed across not only Alberta, but also in B.C., Manitoba, Saskatchewan, Ontario and Quebec. We are currently in the process of having 6000 additional copies printed to distribute.

Age Verification
The Canadian cattle industry is experiencing some significant changes right now. Due to the increase in demand for producers, several ARECA groups held age verification workshops where a CCIA representative was present and updated producers, and then assisted them an the age verification process. These workshops were a HUGE success with attendance over 400 across the province.

Western Canadian Grazing Conference
The Livestock and Forage Teams really ramped things up now with the Western Canadian Grazing Conference. There were over 425 people in attendance and several who had never attended before. The program for the conference was awesome and was loaded with some excellent keynote speakers and a great lineup of concurrent session speakers. A highlight, this year, was the WCGC 2006 Innovation of the Year. The Western Canadian Grazing Conference 2006 would like to acknowledge and learn from the ingenuity and innovation of our farmers and ranchers. We have all come across brilliant ideas and inventions at our neighbors, on farm tours, and maybe even thought of them ourselves. It was a huge success with 12 entries from which we had 3 winners; Leroy Lawson (Hanna), Steve Kenyon (Busby), and Kim Neilson (Clearwater County).

Sustainable Grazing Mentorship Program
Jim Stone has been developing the program nationally now with 4 mentors in Nova Scotia, 4 in Ontario, 7 in Manitoba, 4 in Saskatchewan and 4 in British Columbia, besides the 14 in Alberta. ARECA's involvement is mainly with the Alberta mentors. Jim has also been busy promoting the program with an article by Lee Hart in Canadian Cattleman that brought 18 producers onboard. His next step is to have articles coming out of Atlantic Beef, Ag Beef, Beef in BC and Grainews.

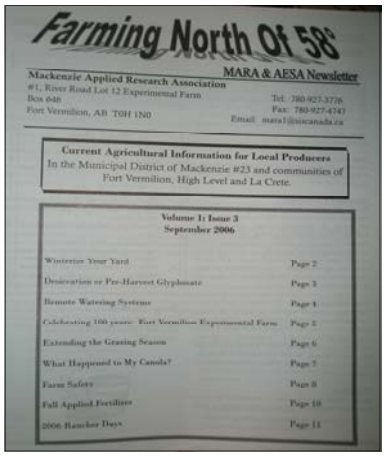
Jim developed a Sustainable Grazing Mentoring Update with Jim Gerrish as the key-note speaker. This event was held on January 9 & 10, 2007 at Olds College. Another activity Jim has been working on is to get printed materials with core "staff" that mentors can leave with the farmer so they can brush up on ideas and keep learning even after the mentor is gone. He also wants to work on a CD with best ideas from around the grazier neighborhood.

Jim says there's still storage of mentors in Alberta in some areas. He expects he should have 100 mentors in Alberta in the next 4 years and about 40 in the rest of Canada.

Grazing Clubs
Arnold Mattson has set up funding to cover the costs of Steven Kenyon and several other speakers to be available to grazing clubs for seminars and/or workshop for 2007. While this is a great opportunity for grazing clubs to bring in speakers at no cost to them, grazing clubs have not been taking advantage of this offer.

Farming North of 58° Newsletter

Funded by the Agriculture Opportunity Fund and Alberta Environmentally Sustainable Agriculture (AESA) and the Agriculture Opportunity Fund


Farming North Of 58°

MARA & AESA Newsletter

Mackenzie Applied Research Association

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Current Agricultural Information for Local Producers
In the Municipal District of Mackenzie #23 and communities of Fort Vermilion, High Level and La Crete.

Volume 1: Issue 3
September 2006

Winterize Your Yard — Page 2
Desiccation or Pre-Harvest Glyphosate — Page 3
Remote Watering Systems — Page 4
Celebrating 100 years: Fort Vermilion Experimental Farm — Page 5
Extending the Grazing Season — Page 6
What Happened to My Canola? — Page 7
Farm Safety — Page 8
Fall Applied Fertilizer — Page 10
2006 Rancher Days — Page 11

The MARA newsletter, *Farming North of 58°* is mailed out to 1000 farm boxes for producer near Fort Vermilion, La Crete, High Level and Buffalo Head Prairie four times per year.

It features research trial, extension and current agricultural information from MARA staff and guest writers from ARECA groups, government, industry and agri-business.

Farming North of 58° Radio Show

Featured during the CIAM Radio Weekend Magazine

" Hi, I'm Kelly Zeleny with the Mackenzie Applied Research Association and this is *Farming North of 58°*. Today……"

Tune in to our local community radio station CIAM every Saturday (1 & 5 pm), for the latest agricultural information on cattle, crops, horticulture, environmental sustainability, upcoming events and more!

92.7 Fort Vermilion
94.1 High Level
95.5 La Crete
104.3 Caribou Mountain
102.9 Red Earth

Annual Field Day

Sponsored by UFA (La Crete), Pioneer Hybrid Ltd., Neufeld Petroleum, Parrish and Heimbecker, Hydway Hardware and Northern Store.

The annual field day for the Mackenzie Applied Research Association and Agriculture and Agri-Food Canada (AAFC) was held August 3. Thirty-two producers joined the tour that covered research trials on-farm and on cooperator sites. Lunch was followed by a door prize draw from local sponsors. Certified Crop Advisors were able to earn 5.5 credits for this event.

Agenda

Kelly Zeleny, MARA Research Coordinator
Growing Sunflower as Alternate Crop

Dr. Kevin Falk, AAFC Oilseed Research & Development
Polish Canola Co-op Trials

Dr. John O'Donovan, AAFC Integrated Cropping Systems
Test 3: Malt Barley Varietal Response to Seed & Nitrogen Rates
Test 28: Canola/Barley Input Study in Canola & Barley Rotations
Test 42: Barley Rotational Trials (Seeding & Herbicide Rates)

Scott Meers, AAFRD Integrated Crop Management
Insect scouting, identification and thresholds.

Blaine Calkins, Pioneer Hi-Bred
Corn Varieties for Northern Alberta

Nick Underwood, Reduced Tillage Linkages
Direct Seeding Applications for Your Farm
Tips for Direct Seeding into Established Grass Pastures

Gardening Conference

Sponsored by Mackenzie County, Home Hardware, Northern Store & UFA

Fourteen individuals attended the Gardening Conference organized by MARA on June 9, 2006 at the La Crete Heritage Center. Speakers provided technical information on topics relevant to northern Alberta gardening while the displays, tools and landscaping materials allowed everyone some hands-on interaction.

Agenda

Marg Zielsdorf, Greenhouse Owner & Operator
Tips on building your own water pond.

Kelly Zeleny, MARA Research Coordinator
Soil Fertility—Understanding the importance of nutrients, deficiency symptoms in plants and fertilizer applications.

Lisa Ladd, Landscaping Architect
Deer-proofing your yard.

Janey Martens, MARA Research Technician
Pruning trees.

Lisa Ladd
Common Insect & Plant Diseases

Tom Bidart, Fairview College Landscaping Instructor
Commercial and Residential Landscaping.

Superpanels: Ask Your Questions!
Marg Zielsdorf: Tips on growing bedding plants and
Tom Bidart: Tips on landscaping.

Before Pruning: June 12

After Pruning: July 16

Environmental Farm Plan Workshops

Funded by the Alberta Environmental Farm Plan Company

Yvonne Marshall-MacRae and assistant Doug Macauley, Woodlot Extension Specialist, facilitated a few Environmental Farm Plan Workshops in La Crete during 2006. The March 17 / 24 workshop was attended by four individuals, the April 20 session was attended by three and the October 13 / 26 workshop was attended by ten producers.

Farm Safety Day

Sponsored by Agricultural Initiatives Program

On August 22, 2006, nineteen individuals from the Fort Vermilion and La Crete area came to the Experimental Farm to learn about farm safety.

Joe Ferdais, Local Producer
How losing my arm in a baler accident impacted my life.

Local producer, Joe Ferdais was the first speaker of the morning. Joe lost his arm in a farm accident in 1981. He explained that the gloves he was wearing were too big for his hands and when he went to start the twine, the tips of the gloves were grabbed by the baler rollers and quickly pulled his arm in. Joe remained with his lower arm pinned in the baler for over fourteen hours before family and neighbours helped free him. While his arm was pinned, Joe had felt only numbness. It was on the way to the hospital that the pain became severe. Joe stated that it not the accident but adapting to your life with one arm that caused him the most unusual difficulties. For example, he asked the children how they would wash their hand or pull a glove on when it is cold. It was learning simple tasks all over again.

Kelly Zeleny, MARA Research Coordinator
Tractor & PTO Safety, Hand Signals

Kelly Zeleny spoke about farm equipment and PTO safety. Three tractors were on display — one with a front-end loader, one with a field mower (PTO) and lawn tractor. Kelly and co-presenter Sato Nosho crushed a heavy plastic pail under the front-end loader to demonstrate the power of machines. They also demonstrated visibility in tractor cabs and how important it is to make sure that you stay away from farmers working. They may be distracted and have reduced visibility. Kelly also demonstrated some universal hand signals, stressing that if you have to get attention of the tractor operator, you have to make sure that they see and come to a complete stop before you approach them. Kelly and Sato also demonstrated PTO safety. Kids can help on the farm — but adults must be aware that the tasks and use of equipment should be age appropriate.

Daryl McAllister, Safety & Audit Services
Quad Safety

Daryl McAllister taught the children a series of acronyms as memory devices so they would remember the rules of quad safety. The children learned quickly how to check tires, oil, lights and electric components. They also learned about wearing helmets and safety gear such as good shoes and long sleeved shirts and pants. Daryl also stressed that quads are not toys—children under twelve should not operate quads over 70 cc and these machines have been designed for only one rider.

George Bueckert
First Aid Tips

Local first aid instructor, George Bueckert gave an informative talk about the importance of knowing first aid. He used the children as assistants to demonstrate the recovery position, splinting, dealing with burns and helping a choking victim. The 911-system was explained and all the children made an emergency contact sheet for take home.

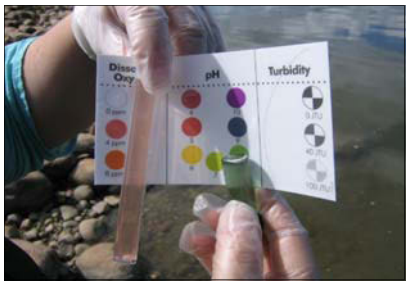
Kelly Zeleny
Water & Dugout Safety / Hearing Safety
Kelly continued with dugout/water safety in the summer and winter months. A display from PFRA was set up and children had a chance to try and simulate crawling out of water in the winter. While most thought it would be an easy task, it proved to be the opposite.

Andrea Vavrek, NPARA Research Coordinator / Kelly Zeleny
Grain Safety / Chemical Safety
Andrea Vavrek and Kelly showed a video on hearing safety and then interactively demonstrated grain safety. Andrea gave the children plastic Ziplocs © and straws and instructed them to try and "breathe" under a pile of grain in a 5 gallon pail. The danger of gravity wagons was displayed in a tabletop working model. Kelly finished the day with chemical safety. Six bottles of coloured liquid and samples of fertilizer and Nerds© candy were set up on the table. Children were asked which were the "real" Powerade© drinks and candy. Though most of the children knew which were the antifreeze, bug wash and fertilizer, the youngest of the group, a four year old boy, thought the copper sulfate looked good enough to eat. The session was wrapped up with a reminder on how small children should be supervised at all times and how farm safety can be prevented by everyone.

Alberta Water Quality Awareness Day

Sponsored by AWQA Program

On June 5, 2006 four individuals from the Fort Vermilion Library Program joined the MARA staff to learn about water quality issues such as turbidity, pH and dissolved oxygen.



Agroforestry Seminar

Sponsored by Greencover Canada Technical Assistance Program

On February 8 (High Level) and February 9 (Hillcrest School) a total of thirteen producers joined speakers Doug Macaulay, Woodlot Extension Specialist and Stacy Wabick, Ducks Unlimited Canada, for on an informative seminar on the integral relationship between trees, soil, forage, wetlands and agricultural practices. Also discussed were the importance of planting and retaining shelterbelts on agricultural land and the economic and environmental potentials of woodlots, alley cropping and silvipasture applications. Best management practices by local producers in the MD 23 were exemplified during the break.

Nutrient Management Workshop

Sponsored by Alberta Environmentally Sustainable Agriculture (AESA) Program

Jason Cathcart, Soil Conservation Specialist and AESA Soil Quality Program Coordinator and Trevor Wallace, Nutrient Management Specialist educated the crowd of four at the La Crete Learning Society on April 26, 2006. Jason provided fascinating information on how soils in Alberta were formed, soil health indicators and the AESA Soil Quality Program. Individuals were able to learn about scoring the health of their soils. Trevor contributed details on nutrient management in regards to fertilizer application and AOPA.

Annual General Meeting

The Annual General Meeting was held March 30, 2006 in La Crete (Grandview Building). The agenda included President's Remarks, 2005 Year in Review and the Annual General Meeting. After supper, Michael Sandstrom (CIAM Radio) entertained the crowd when he recalled his agricultural experiences and shared a video "After the Harvest".

High Voltage Power Safe Days

Sponsored by ATCO Electric

Fort Vermilion Experimental Farm
Session I: June 20 / 10 am to noon
Session II: June 20 / 1-3 pm

La Crete MD Shop
Session I: June 22 / 10 am to noon
Session II: June 22 / 1-3 pm

Don Warman and Jerry Krahn from ATCO Electric cautioned the crowd on high voltage safety issues. They brought the high voltage display and demonstrated direct contact with a tree branch, leather glove and metal pole on the line. A sausage was cooked to simulate what high voltage would do to your body. After the safety video showcasing actual high voltage accidents (fatal and serious injury), Don and Jerry discussed safety tips and accident prevention with everyone. They also demonstrated what they are responsible for on their jobs. A total of fourteen people attended the Fort Vermilion sessions and eight attended the La Crete sessions.

Western Canadian Grazing Conference

An event organized by ARECA members

The Western Canadian Grazing Conference is held every two years in Alberta. Planning started January 2006 and Kelly Zeleny represented MARA on the Promotions Committee. This event proved to be very successful with over 425 individuals attending.

Pasture School Part I & II

Sponsored by Greencover Canada Technical Assistance Program, the Alberta Environmentally Sustainable Agriculture (AESA) Program and Public Lands—Fort Vermilion.

On April 10, 2006 Part I of the Pasture School was held at the Fort Vermilion School Division. Sonja Raven, Public Lands Rangeland Agrologist presented on local pasture plant identification, including palatable weed identification and toxic range plants.

Keynote speaker was Jim Stone, a producer from Olds, AB. He was a former Olds college instructor who now specializes in fencing design and working as a Sustainable Grazing Mentor (ARECA). Jim talked about fencing, watering systems, grazing rotations and fencing equipment. Public Lands provided aerial photos for each producer so Jim could advise them on fencing and watering system designs unique for their own operations. After the classroom presentation, the group of ten producers moved to the Experimental Farm bison pasture for some smooth wire demonstrations.

Jim entertained questions from five producers for Part II of the Pasture School on June 21, 2006. An all-day heavy rain turned this event into a "Pasture Ride" compliments of chauffer John Simpson. However, Jim was still able to tour local area pastures and offer advice on planning fences and managing grass during rest periods and grazing. The group ended up and Peter and Hilda Wieler's to finish discussions and warm up with lunch and coffee.

Pasture School for Farm Women

Sponsored by Alberta Environmentally Sustainable Agriculture (AESA) Program

The agenda for the July 19, 2006 Pasture School in La Crete included: Sonja Raven, Public Lands Rangeland Agrologist (Fort Vermilion)— bush pasture management in the classroom and field; Kelly Zeleny—common health conditions/problems seen in pasture cattle and Cathie Erichsen-Arychuk, Alberta Agriculture, Food and Rural Development Pasture Specialist (Fairview) — tame pasture plant identification in the classroom and field and grazing management tips. Unfortunately, no one showed up for the presentations.

2006 Diagnostic Field School: Seed Quality

Good seed management starts with getting as much information on the quality of your seed lot through seed testing as soon as the crop is harvested. Technology is advancing rapidly, allowing professionals to delve deeper into seed quality aspects and be more able to predict field performance sooner than later (www.2020seedlabs.ca).

Germination tests can be completed at home or a laboratory (cost about $20.00). It is the most widely accepted test for assessing seed viability. Repeating a germination test every few weeks is a good practice if you find abnormal or dormant seeds. The most valued germination test is conducted with a vigor test.

Vigor testing is the opposite of germination because the seed is introduced to an environment that is known to suppress and stress the growth of the seedling. There are a few vigor tests that can be performed to stress the seed—the cold cereal test, the pre-chill test developed by the Canola Council of Canada and the electrical conductivity test for peas and beans. Vigor tests are more sensitive than germination tests and vigor loss may be noted faster than a loss in germination. Deterioration and aging cause the major loss of vigor. Careful handling of seed is very important, especially in large seeds such as pulses. Mechanical damage can occur readily on low moisture peas and cause faster spoilage.

Frost caused by freezing temperatures during final developmental stages will cause seed damage. An early germination or vigor test will assess storage and planting potentials of the seed. Heating damage, which may be linked with fungal activity can be very damaging as well.

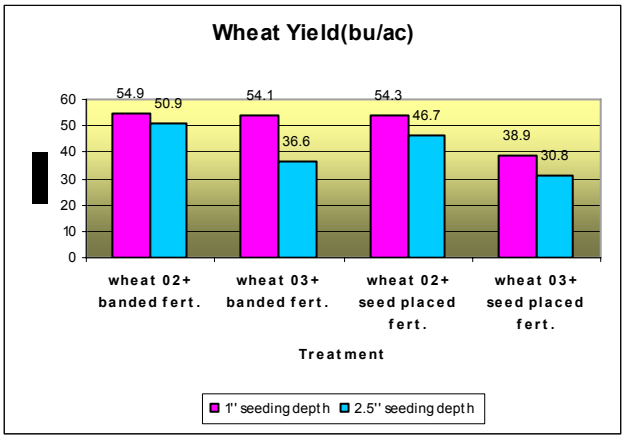
Other factors that will affect seed quality include insects, fungi and other pathogens (Reference: Are You Maximizing the Potential of Your Seed?, Kevin Zaychuk).

Kevin Zaychuk, a representative from 20/20 Seed Labs Inc., worked with MARA staff in spring 2006 to design a Diagnostic Field School focusing on seed quality. Kevin later visited Fort Vermilion on August 1, 2006 and presented our demonstration results to a group of twelve producers. The treatments and results have been summarized on the next two pages.

Site 1: Low Vigor Wheat

- Two seed lots (01 or 02) of low vigor wheat were used.
- Two seeding depths— 1" (normal) or 2.5"
- Fertilizer mix 26-15-5-5 applied at 150 lbs/acre—side banded or seed placed (SP)
- Plant counts were completed to determine % plant emergence

Treatment	Bu/ac	% Est
Wheat 02 + 1" depth + Fert.	54.9	78.0
Wheat02 + 1" depth + SP Fert	54.3	75.6
Wheat 03 + 1" depth + Fert.	54.1	74.2
Wheat02 + 2.5" depth + Fert	50.9	72.9
Wheat02 + 2.5" depth + SP Fert	46.7	68.5
Wheat03 + 1" depth + SP Fert	38.9	69.2
Wheat03 + 2.5" depth + Fert	36.6	52.0
Wheat03+ 2.5" depth + SP Fert	30.8	49.8
LSD at .05	**10.15**	
CV	**12.54**	

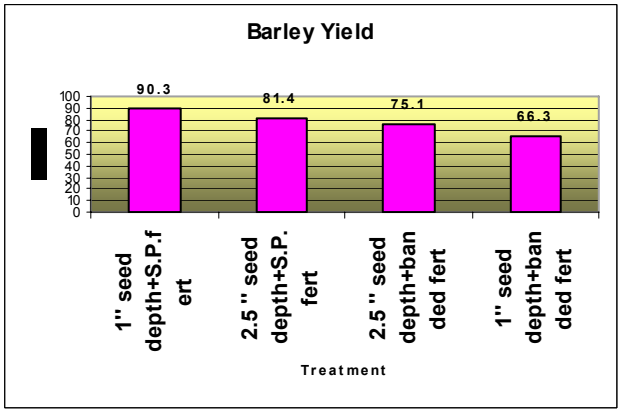


The low vigor wheat that was stressed with both deep seeding and seed-placed fertilizer expectedly emerged and performed poorly. In general the wheat yielded better than expected—that may be attributed to adequate precipitation received in the growing season.

Site 2: Barley Seed Infected with Root Rot

- One seed source
- Two seeding depths—1" and 2.5"
- Fertilizer mix 26-15-5-5 applied at 150 lbs/acre—side banded or seed placed
- Plant counts were completed to determine % plant emergence

Treatment	Bu/ac	% Est
1" seed depth + seed placed fertilizer	90.3	83.8
2.5 " seed depth + seed placed fertilizer	81.4	80.5
2.5 " seed depth + banded fertilizer	75.1	81.3
1" seed depth + banded fertilizer	66.3	80.2
LSD at .05	**29.15**	
CV	**18.65**	

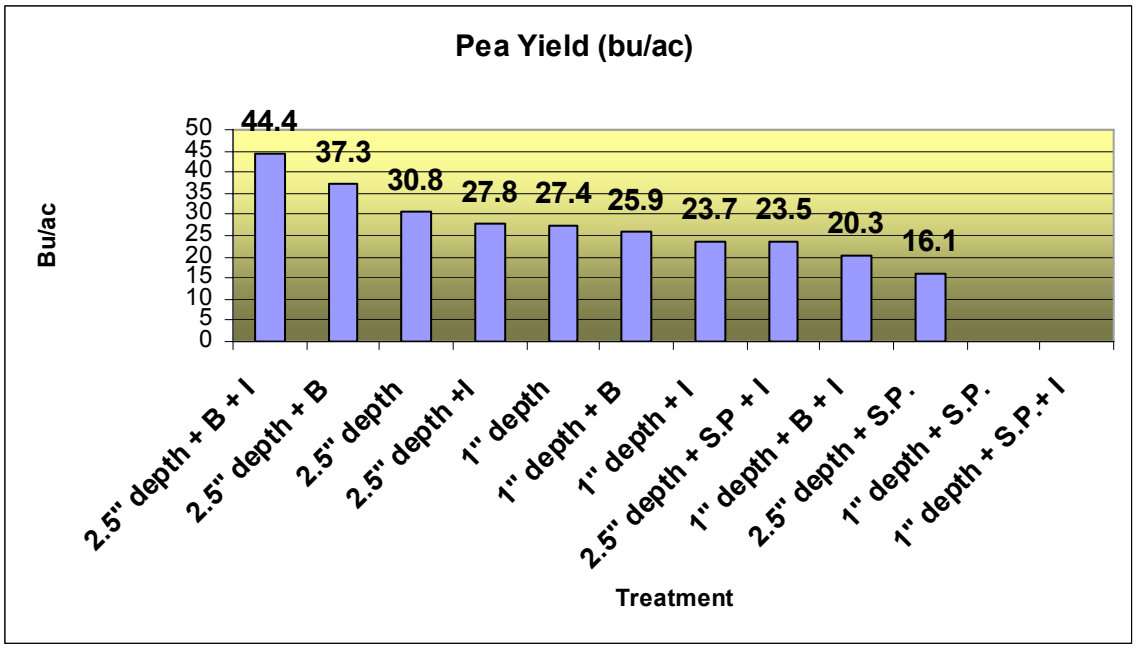


Again, this trial yielded well from all the rain it had received during the growing season. The management stressors did not have a corresponding negative affect on yields as expected.

Site 3: Mechanical and Glyphosate-Damaged Field Peas

- One seed source was used.
- Two seeding depths— 1" and 2.5" (normal).
- Fertilizer treatments— mix 26-15-5-5 applied at 150 lbs/acre—side banded or seed placed (SP) and no fertilizer applied.
- Inoculant applied or not applied (peat based granular).
- Plant counts were completed to determine % plant emergence.

Treatment	Bu/ac	Plants /m	Plant establishment (%)
2.5" depth + banded fertilizer + Inoculant	44.4	4	51.5
2.5" depth + banded fertilizer only	37.3	8	46.0
2.5" depth	30.8	8	44.2
2.5" depth + Inoculant only	27.8	6	31.0
1" depth	27.4	6	27.5
1" depth + banded fertilizer only	25.9	6	15.6
1" depth + Inoculant only	23.7	3	20.1
2.5" depth + seed placed Fertilizer + Inoculant	23.5	4	25.2
1" depth + banded fertilizer + Inoculant	20.3	4	18.2
2.5" depth + seed placed fertilizer only	16.1	2	14.5
1" depth + seed placed fertilizer only	-	3	1.0
1" depth + seed placed fertilizer + Inoculant	-	2	0
LSD (P=.05)	**19.84**		
CV	**31.65**		



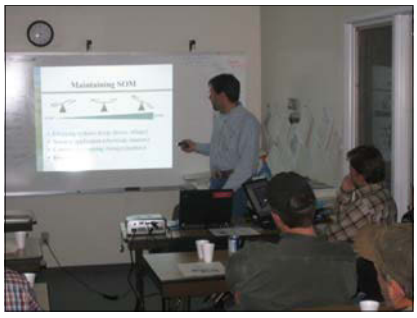
Thank-you! Kevin Zaychuk and 20/20 Seed Labs Inc. for expertise, seed and the presentation.

Rancher Days

Sponsored by Greencover Canada Technical Assistance Program, the Alberta Environmentally Sustainable Agriculture Program and UFA

October 17: Amber Havens, a Livestock Agronomist from the Peace Country Beef and Forage Association spoke about grazing plans, year round grazing in Alberta and Cow Bytes ration balancing software at the Northern Lakes College in Fort Vermilion. Attendance: 11 + staff.

October 18: Pieter Vander May with Gallagher Fencing Systems presented to local producers at UFA La Crete. He showcased new equipment and focused on designing efficient fencing systems. Attendance: 6.



October 19: Trevor Wallace, Jason Cathcart and Cathie Erichsen-Arychuk spoke on manure management, soil forming properties and riparian management when designing watering systems, respectively. Attendance: 12 + staff.

Integrated Pest Management Surveys

Funded by Agriculture and Agri-Food Canada through ARECA

In early November, MARA conducted a survey (with 33 producers) on Integrated Pest Management to identify which Better Management Practices (BMPs) producers in Mackenzie County are familiar with and which they practice on their operations. The results were summarized for Alberta and the three BMPs identified for additional extension work in our program are: Crop Competitiveness, Herbicide Rotations and Crop Scouting. Participants received a 2007 MARA membership for their time and cooperation.

Regional Variety Trials: Cereals, Flax and Field Peas

Funded by ARECA RVT Program and the Alberta Barley Commission

Polish Canola Co-op Trial

Funded by Agriculture & Agri-Food Canada (AAFC)

Take Home Message

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

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

Background

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

Objectives

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

Materials and Methods

The 2006 Regional Variety Trials consisted of 16 lines of 6-row barley, 15 lines of 2-row barley, 9 lines of flax, 17 lines of oats, 6 lines of utility wheat, 17 lines of hard red spring

wheat, 5 lines of triticale, 12 lines of yellow peas and 5 lines of green peas. This year the Polish Co-op trial consisted of 12 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. In this way, the number of seed for each entry is almost the same. All seed was treated —cereal and flax seeds with Raxil and canola seeds were treated with Helix. Plots were planted at 6.5 meters in length with four rows 12 inches apart. Harvest area was 5 meters long by 1.22 meters wide. Seeding depth for cereals varied from 1—1.5 inches depending on soil texture and moisture conditions. The seeding depth for canola and flax ranged between 1/4—1/2 inch.

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

Table 1: 2006 Variety Trial Management Information

Crop	Seeding Date	Harvest Date	Previous Crop	Fertilizer NPKS (lb/ac)	Herbicide	Application Rate/Acre
Oats	May 11	August 31	Canola	26-15-5-5 200 lbs/ac	Buctril M	400 ml
Wheat	May 11	September 29	Canola	26-15-5-5 200 lbs/ac	Buctril M	400ml
Barley	May 15	August 28	Canola	26-15-5-5 200 lbs/ac	Buctril M	400 ml
Triticale	May 11	September 28	Canola	26-15-5-5 200 lbs/ac	Buctril M	400 ml
Canola	May 4	September 8	Barley	26-15-5-5 200 lbs/ac	Post Ultra + Merge + Lontrel	130 ml + 200 ml + 170 ml
Polish Canola	May 29	Not Available	Wheat	26-15-5-5 200 lbs/ac	Muster	8g
Flax	May 11	October 6	Barley	26-15-5-5 200 lbs/ac	Post Ultra + Merge + Buctril M	190ml + 400ml
Field Peas	May 12	August 30	Barley	No fertilizer	Odyssey + Merge	11.7g + 200ml

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

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

A 125-C Hege plot harvester was used to collect the mature seed for all the trials. Samples were sent through a Clipper seed cleaner and then evaluated for field yield, test weights and 1000 kernel weights. Yields were not obtained from the Polish Canola Co-op trial due to poor initial establishment of the test.

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 2006 growing season was predominantly with steady rainfall amounts. This influenced good growing conditions and therefore, establishment of all the trials (Fig.1 to 4). Throughout the growing season all the trials did not show any insect, disease, weed and lodging problems. However, heavy lodging was seen in the field pea trial.

Maturity for cereals is recorded as a +/- from the check variety. For example, AC Morgan oats is one day early maturing than the check Cascade (at 105 days). The following 2 - 10 tables summarize the data obtained in the year 2006 growing season.

Table 2: 2006 Fort Vermilion Agronomic Data—2 Row Barley

Variety	Yield (bu/acre)	Height (cm)	Maturity (days)	Lodge (1-9)	Seed Size (g/1000)
XENA	**127.7**	69	+2	1	49.57
B-2657	**120.5**	66	-1	1.5	46.41
MCLEOD	**117.5**	68	0	1	44.03
NEWDALE	**115.7**	69	-2	1	48.76
SEEBE	**114.4**	84	+1	1	53.43
CDC TREY	**113.9**	82	-2	1	48.28
B-2316	**111.1**	67	0	1	48.24
AC METACALFE	**111**	75	0	1	47.52
CONRAD	**109.1**	68	0	1	46.64
PONOKA	**107.8**	77	+1	1	51.11
HARRINGTON	**104.6**	**77**	**98 days**	**1**	**47.13**
CONLON	**96.5**	67	-1	1	52.35
FORMOSA	**95.3**	68	+1	1	48.88
TR 04719	**94.9**	68	0	1	53.77
CDC COWBOY	**92.3**	95	0	1	49.64
LSD at 0.05	**23.84**				
CV	**13.1**				

Figure 1. Triticale Variety Trial

Figure 2. Oats Variety Trial

Table 3: 2006 Fort Vermilion Agronomic Data—6 Row Barley

Variety	Yield (bu/acre)	Height (cm)	Maturity (days)	Lodge (1-9)	Seed Size (g/1000)
BT566	**136.55**	88	+1	1	46.59
VIVAR	**133.11**	70	0	1	47.96
CDC CLYDE	**129.63**	69	-2	1	42.73
BT 974	**126.25**	70	+1	1	42.61
LEGACY	**126.18**	72	+1	1	42.71
TROCHU	**125.94**	78	0	1	42.65
MANNY	**125.04**	84	0	1	41.55
CDC BATTLEFORD	**123.81**	79	-2	1	50.98
LACEY	**122.37**	73	0	1	44.12
AC METCALFE	**119.6**	87	0	1	49.88
STELLAR	**116.88**	80	+1	1	44.52
KASOTA	**116.6**	65	-3	1	37.17
TRADITION	**113.05**	81	-1	1	42.53
MILLHOUSE	**109.58**	85	0	1	43.80
HARRINGTON	**107.23**	**77**	**98 days**	**1**	**47.20**
TYTO	**103.64**	69	0	1	45.23
LSD at 0.05	12.67				
CV	6.28				

Table 4: 2006 Fort Vermilion Agronomic Data—Utility Wheat

Variety	Yield (bu/acre)	Height (cm)	Maturity (days)	Lodge (1-9)	Seed Size (g/1000)	protein (%)
HY 476	**75.8**	64	0	1	46.32	
AC TABER	**72.8**	69	0	1	47.85	
CDC RAMA	**63.4**	88	-1	1	51.41	
AMAZON	**63.1**	82	+2	1	51.83	
HY 475	**62**	69	0	1	47.7	
AC CRYSTAL	**55.3**	65	0	1	46.92	
LSD at 0.05	12.74					
CV	10.74					

Table 5: 2006 Fort Vermilion Agronomic Data—Hard Red Spring Wheat

Variety	Yield (bu/acre)	Height (cm)	Maturity (days)	Lodge (1-9)	Seed Size (g/1000)	Protein (%)
AC SUPERB	**60.7**	78	0	1	43.83	15.1
CDC ALSASK	**56.8**	84	0	1	39.06	15.6
AC SOMERSET	**56.8**	85	-1	1	37.98	14.9
CDC OSLER	**56.5**	78	0	1	37.37	15.5
INFINITY	**55.1**	72	+2	1	35.7	15.5
PEACE	**53.1**	91	+1	1	38.39	14.8
KATEPWA	**49.4**	85	-1	1	36.72	15.7
PT213	**48.5**	84	0	1	40.54	16.1
HARVEST	**45.9**	80	-1	1	39.02	15.8
5602HR	**45.2**	84	0	1	40.1	17.2
CDC GO	**44**	68	0	1	46.82	15.7
AC BARRIE	**43.1**	**82**	**110 days**	**1**	**39.08**	**16.1**
BW315A	**42.1**	70	+1	1	35.05	16.0
BW824	**41.3**	65	0	1	44.2	15.6
SNOWBIRD	**36.8**	80	0	1	40.58	16.1
PARK	**33.7**	77	-1	1	37.95	15.8
KANATA	**31.1**	60	-1	1	33.88	16.6
LSD at 0.05	14.33					
CV	18.27					

Table 6: 2006 Fort Vermilion Agronomic Data—Triticale

Variety	Yield (bu/acre)	Height (cm)	Maturity (days)	Lodge (1-9)	Seed Size (g/1000)
AC ULTIMA	**103.6**	99	+1	1	50
PRONGHORN	**102.0**	**93**	**115 days**	**1**	**50.09**
T182	**93.1**	92	-2	1	52.12
COMPANION	**85.8**	118	+2	1	50.48
T181	**76.0**	107	-1	1	53.79
LSD at 0.05	15.64				
CV	12.51				

Table 7: 2006 Fort Vermilion Agronomic Data—Oats

Variety	Yield (bu/acre)	Height (cm)	Maturity (days)	Lodge (1-9)	Seed Size (g/1000)
AC MORGAN	173.4	99	-1	1	43.17
OT 576	171.8	94	+1.5	1.5	46.09
OT 2027	166.8	97	+1.3	1	44.53
CDC ORRIN	166.3	99	-2	1	43.79
CASCADE	157.9	103	105 days	1	40.93
OT 566	150.3	98	-2	1.5	41.22
RONALD	148	89	0	1	39.14
SW BETANIA	147.6	96	0	1	38.75
AC FURLONG	146.9	91	-3.5	1	45.22
DANCER	145	99	-0.5	1.5	38.49
MURPHY	143.9	105	-2.0	1	35.34
LEGGETT	139.3	97	+0.5	1	40.5
CDC BALER	136.4	102	+0.5	1	45.19
HI FI	135.6	94	-1.5	1	35.56
CDC SOL-FI	128.1	100	-1.5	1	37.67
CANMORE	125.3	89	+1.5	1	40.56
CDC WEAVER	123	101	-1.5	1	44.75
SLD at 0.05	35.32				
CV	14.37				

Table 8: 2006 Fort Vermilion Agronomic Data—Flax

Variety	Yield (bu/acre)	Height (cm)	Maturity (days)	Lodge (1-9)	Seed Size (g/1000)
CDC SORREL	35.4	59	+1	1	7.44
FLANDERS	34.2	57	+0.5	1	6.33
NORLIN	33.7	58	118 days	1	6.67
FP 2161	33.4	58	-1.5	1	6.47
CDC BETHUNE	32.9	60	-1	1	6.15
LINOLA 2090	32.4	56	-1	2	6.83
LINOLA 2047	31.8	65	-0.5	1	6.44
HANLEY	31.5	56	+1	1.5	6.60
CDC NORMANDY	30.9	59	-0.5	1	6.64
LSD at 0.05	3.85				
CV	8.01				

Table 9: 2006 Fort Vermilion Agronomic Data—Green Peas

Variety	Yield (bu/acre)	Height (cm)	Lodge (1-9)	Seed Size (g/1000)
COOPER	65.7	95	3.5	194.41
CAMRY	64.8	110	5.5	257.58
NITOUCHE	58.7	76	5	254.58
SAGE	53	92	6	284.34
TAMORA	52.4	97	4	267.84
LSD at 0.05	9.7			
CV	10.58			

Table 10 : 2006 Fort Vermilion Agronomic Data—Yellow Peas

Variety	Yield (bu/acre)	Height (cm)	Lodge (1-9)	Seed Size (g/1000)
AC REWARD	83.1	68	2.5	209.7
CDC 653-8	79.8	81	5.5	256.55
POLSTEAD	71.5	68	6.5	257.68
DS ADMIRAL	71.3	72	4	281.68
SW MIDAS	70.5	85	7	199.62
TUDOR	70.3	56	5	277.25
ECLIPSE	67.9	82	2.5	252.91
CANSTAR	67.7	73	7	288.56
CDC 728-8	64.7	70	9	206.31
CUTLASS	63.6	95	5.5	254.09
SW MARQUEE	61	91	3	229.83
AC MISER	59.3	81	7.5	226.81
LSD at 0.05	12.42			
CV	12.42			

Figure 3. Field Pea Variety Trial

Figure 4. Flax Variety Trial

Prairie Canola Variety Trials: Fort Vermilion

Funded by the Canola Commission of Canada

Take Home Message

MARA has grown the Prairie Canola Variety Trials (PCVT) since 2004, although the trials were established on the Experimental farm at Fort Vermilion during the previous year with Agriculture and Agri-Food Canada. In 2006 forty-five cultivars of Argentine canola were evaluated. Field observations revealed good establishment of most plots.

Background

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

The PCVT Trials are grown in three major maturity zone: short (roughly corresponds to Alberta agro climatic area 4, 5 and 6), mid (area 2 and 3) and long (area 1). The Canola Digest prints location specific results in December and the data is posted on the Canola Council website. A summery is also published by Alberta Agriculture. Yield columns shows the actual yield of the check (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 are 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 differences between two varieties is lass 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

Materials and methods

The 2006 Prairie Canola Variety Trials consisted of 20 lines of argentine canola NS 1, and 25 lines of argentine canola NS 2 (figure 1, 2). A randomized complete block design with four replicates was used. Each plot was seeded and to 6.5 m by 4-row plot seeder with 12-inch row spacing. Throughout the growing season, field notes observing or measuring the maturity lodging and height were recorded

A pre-harvest Reglone desicant was applied at the rate of 1L/acre(Reglone) with 40L/acre water volume. Varieties were harvested with a 125-C Hege plot harvester.

Results and Discussion

Table 1, 2 summarized the data obtains in the 2005 growing season.

In the 2006 growing season between May and August, there were 10.1 inches of rainfall recorded and this good moisture condition enhanced growth and yield. All the varieties did not show any major insect, disease, weed and lodging problems.

Figure 1. Canola seedlings

Figure 2. Canola Variety Trial

Table 1: 2006 Fort Vermilion Agronomic Data—Canola PNS1 (Check variety 46A65)

Variety	Yield (bu/acre)	Height (cm)	Maturity (days)	Lodge (1-9)	Seed Size (g/1000)
InVigor 5020	**43.8**	85	+3	1.3	6.34
SP Desirable	**41.9**	95	+0.5	1.3	4.79
45H73	**41.6**	95	+0.5	1.3	5.93
71-20CL	**41.6**	86	+1.5	1	6.44
45H21	**41.5**	92	+1	1.3	6.24
PHS02-568	**41.2**	85	0	1.5	6.2
45H25	**40.8**	78	+1	1	5.77
SW5272	**40.1**	93	+1	1.3	6.79
SW H5264 RR	**40.1**	92	-0.5	1.3	6.45
SW-PF 02-3910	**39.7**	87	+2.5	1.3	5.89
997-03	**39.6**	85	+2	1	5.96
1839V	**39.1**	86	+0.5	1	6.22
71-45RR	**38.3**	95	+0.5	1	5.72
SW5278	**38**	89	+2	1	5.95
32-75	**37.3**	84	+2	1	6.29
SW H5289 RR	**36.8**	90	-0.5	1	6.42
SW G5246RR	**35**	90	-0.5	1	5.87
43A56	**34.4**	87	-1.5	1.3	5.26
1896	**34.2**	95	+2.5	1.3	6.03
46A65	**33.2**	**93**	**99.5 day**	**1**	**5.73**
LSD at 0.05	**7.62**				
CV	**13.7**				

Table 2: 2006 Fort Vermilion Agronomic Data—Canola PNS 2 (Check variety 46A65)

Variety	Yield (bu/acre)	Height (cm)	Maturity (days)	Lodge (1-9)	Seed Size (g/1000)
03N322R	**60**	91	+2	1	4.66
03H631	**59.9**	96	+0.2	1	5.78
SW H 5263 RR	**58.2**	90	+0.7	1	5.48
45H21	**57.6**	93	+1	1.3	4.83
Reaper	**57.1**	91	-0.3	1	5.67
45H24	**56.1**	91	-0.3	1	5.4
InVigor 5070	**55.5**	96	+1.2	1	5.55
04N201I	**53.3**	86	-0.8	1.3	5.8
SW H 5269 RR	**53**	90	-1	1.5	5.32
InVigor 5030	**52**	85	+1.5	1.3	5.46
45H26	**51.7**	83	-0.3	1	5.57
SW-PF 02-3902	**51**	94	+0.7	1	5.18
292 CL	**49.8**	97	+0.5	1	4.81
v 1031	**49.6**	98	+0.5	1	5.41
SW-PG 02 1017	**49.3**	93	0	1	5.54
NO01-5815	**46.7**	94	+0.5	1	5.73
BSC301L	**46.3**	90	1	1	5.87
BC937 - 104 LL	**45.7**	95	+0.7	1.3	6.16
46A65	**44.6**	**82**	**99.8 days**	**1**	**5.05**
45H72	**44.5**	92	-0.5	1	5.44
Fortune RR	**44**	91	+0.2	1	5.19
Manor	**43.5**	94	+0.5	1	5.19
SP Banner	**42.8**	90	+0.2	1.3	5.3
v 1030	**40.8**	95	0	1.3	4.82
1818	**40.6**	94	0	1	5.4
LSD at 0.05	**8.86**				
CV	**12.5**				

Barley Seed Treatment Evaluation

Funded by the Alberta Barley Commission
Products supplied by Neufeld Petroleum

Take Home Message

There are several cereal seed treatments on the market. The decision to use a seed treatment depends on many factors: environmental conditions at seeding, crop rotations, pathogen exposure, cost, seed source and personal preference. The risk of disease generally is reduced when proper crops rotations and a good seed source are used.

Background

Charter

Charter (triticonazole) is manufactured by BASF. It controls barley diseases such as smuts, seed rot (*Fusarium spp.),* seedling blight and suppresses Fusarium crown and root rot. It is important that the seed is clean and coverage is adequate to ensure proper rates. Charter must be mixed with water for application. Cost per acre = $6.83.

Dividend

Dividend is manufactured by Syngenta Crop Protection Canada Inc. and contains the active ingredients difenoconazole and metalaxyl-M. It controls dwarf bunt, Fusarium and Pythium damping-off, general seed rots, loose smut, seed and soil borne Fusarium and Septoria and suppresses common rot root, take-all, Fusarium crown and root rot in barley. Dividend can be misted onto seed, applied with gravity flow or applied with treat-on-the-go air seeders. Even seed coverage is necessary for disease control. Cost per acre = $7.91-14.73.

Raxil

Raxil is produced by Bayer CropScience Inc. and contains the active ingredients tebuconazole and thiram. It controls covered, loose and false loose smuts, general seed rot, seed borne seed rot, Fusarium seeding blight and suppresses Fusarium root and crown rots for barley. It comes as a ready-to-apply water based seed treatment formulation. Cost per acre = $2.68.

Vitaflo 280

Vitaflo 280, produced by Bayer CropScience Inc. contains carbathiin and thiram as active ingredients. It controls covered smut, false loose smut, seed decay, seedling blight, true loose smut and suppresses net bloch for barley. Seed should be clean and dry before treatment. Cost per acre = $5.03-13.13.

Materials and Methods

This evaluation trial was seeded in two locations. Both sites were seeded on May 29, 2006 with air seeders at a rate of 100 lbs/acre (based on 1000 KWT calculations) and fertilized with a granular mix 27-12-9-4 applied at 150 lbs/acre. Fertility decisions were based on soil test results. The Kendall barley seed used in this trial was previously cleaned and each treatment was seed applied according to label by MARA staff. Untreated seed was used as a check..

Results and Discussion

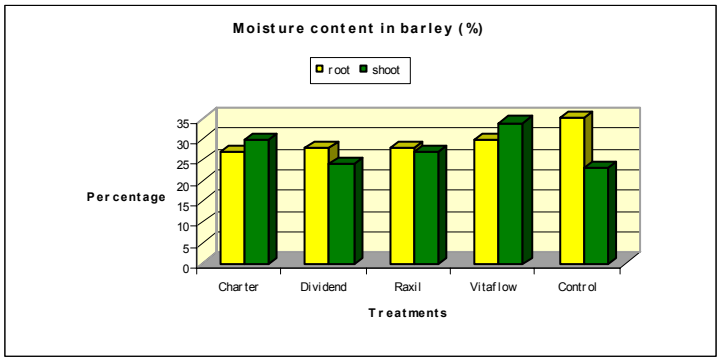
Data was measured from only one of the two sites. From the averaged results in Figure 1 below, the check variety yielded the lowest at 92.2 bu/acre. The seed treated with Raxil yielded the highest at 106 bu/acre. Sample plants from each plot were dug and root and shoot weights were measured on August 18, 2006. In Figure 4, there were not any significant differences in shoot or root weights seen in any treatment.

Figure 1: Experimental Farm yield results.

Fungicides	Bu/ac
Charter	93.2
Dividend	98.2
Raxil	106
Vitaflo	101.8
Check	92.2
LSD	**11.66**
CV	**6.26**

Figure 2: Seed treating barley.

Figure 4: Moisture content in barley plants. Samples collected from 10 locations / 3 plants per location and oven dried at 100 Fº for 3 days.



Conclusion

The decision to use a seed treatment depends on a few factors. Providing that your seed source does not have a seed-borne disease , the most likely conditions seed treatments would be effective are during early seeding when cold and dry or cold and wet conditions are present. With any management decision, it is necessary to factor out costs per acre and the return that you will receive for your investment. A sound seed base is necessary — laboratories are available to test seed for pathogens in addition to germination and vigor tests.

Alberta Pest Survey

Funded by the Agriculture Opportunity Fund through ARECA

Take Home Message

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

Bertha Armyworm Survey

The Bertha Armyworm over winters as a pupae and adults emerge from mid-June until August. Females lay eggs on the underside of canola leaves. When hatched, the larvae are pale green in colour and turn brown to black with yellow stripes on the side of their bodies as they mature. Canola is food of choice but you may find them in flax, alfalfa, peas and corn.

Two traps per site (Figure 1) containing a pheromone and insecticide were set up in canola fields near Fort Vermilion and Rocky Lane. Numbers of Bertha Armyworm did increase at both sites throughout the summer, but the numbers were not of concern.

Diamondback Moth Survey

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

The traps for Diamondback moths resemble small white houses with a pheromone hanging inside. As the moths are attracted to the traps, they become stuck to the adhesive floor. MARA also monitored traps containing five different types of Diamondback moth pheromones. In general, few moths were caught in traps around the Fort Vermilion area in 2006.

Flea Beetle

Little to no damage was noted to canola fields in 2006.

Grasshopper

Grasshopper numbers were very low in 2006.

Setting Diamondback traps.

Pheromone capsule.

Figure 1: Bertha Trap

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

Funded by Alberta Environmentally Sustainable Agriculture

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 this 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 three factors and replicated three times. Factor A included three fertilizer rates of NPKS (36-0-7-3-3 at 120, 147 and 180 lbs/acre). Factor B included three fertilizer rates of NP (11-52 at 20, 25 and 29 lbs/acre). Factor C was three seeding rates of barley (80, 90 and 110 lbs/ac). Plot size measured 25 feet wide by a half a mile long. Direct seeding occurred on May 17, 2006 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 three factors replicated three times. Factor A was three fertilizer rate of NPKS (36-0-7-3-3 at 140, 170 and 200 lbs/ac). Factor C was three fertilizer rates of NP (11-52 at 14, 17 and 22 lbs/acre). Factor C was three seeding rates of Roundup Ready canola (4, 5.5 and 8, lbs/ac). Plot size measured twenty five feet wide and about one mile long. The canola seed was treated with Helix© and seeded on May 9, 2006. The 1000 kernel weight of this seed was 3.98 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 .

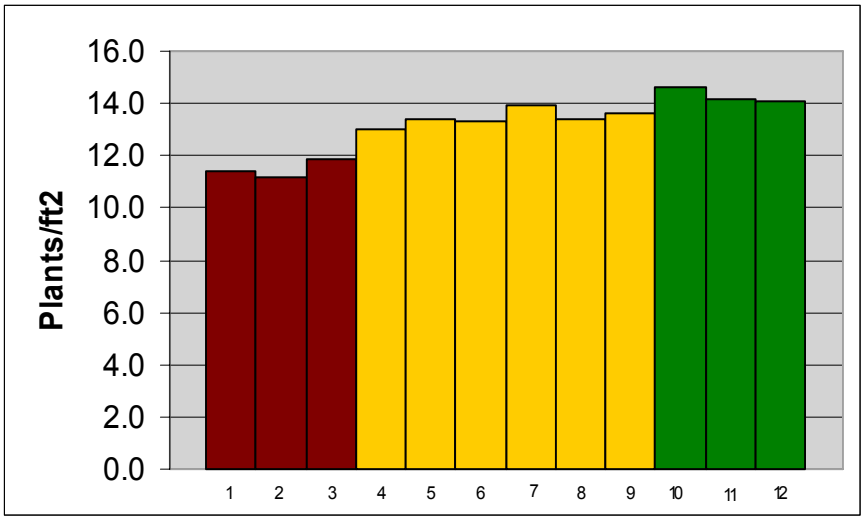
Results and Discussion

On June 6, 2006 a plant count per squared foot was performed on all barley plots (8 samples/ plot and averaged). 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 80.0 lbs/ac was 11.7 plants/ ft², the seeding rate of 90 lbs/ac was 13.4/ plants/ ft² and the seeding rate of 110 lbs/ac was 14.6plants/ ft². According to statistical results there was not interaction between fertilizer and seeding rates.

Also on June 6, a plant count per squared foot was accomplished on the canola trial (8 samples/ plot). The results indicate that the plant emergence average at the seeding rate of 4 lbs/acre was 8.2 plants/ft², the seeding rate of 5.5 lbs/acre was 8.5 plants/ft² and the seeding rate of 8 lbs/acre was 9.3 plants/ft². According to the statistical results there was not interaction between fertilizer and seeding rates.

Weed control was excellent and lodging, insect or diseases was not observed to be present.

Figure 1: BARLEY: Effect of seeding rate and fertilizer rate on plants/ft².



Fertilizer Treatments

1 / 2 / 3
25 lbs/acre: 11-52
147 lbs/acre: 36-0-7-3-3

4
20 lbs/acre: 11-52
120 lbs/acre: 36-0-7-3-3

5 / 6
20 lbs/acre: 11-52
180 lbs/acre: 36-0-7-3-3

7 / 8 / 9
29 lbs/acre: 11-52
120 lbs/acre: 36-0-7-3-3

10 / 11 / 12
25 lbs/acre: 11-52
147 lbs/acre: 36-0-7-3-3

Figure 2: BARLEY: Effect of seeding rate and fertilizer rate on yield (bu/acre).

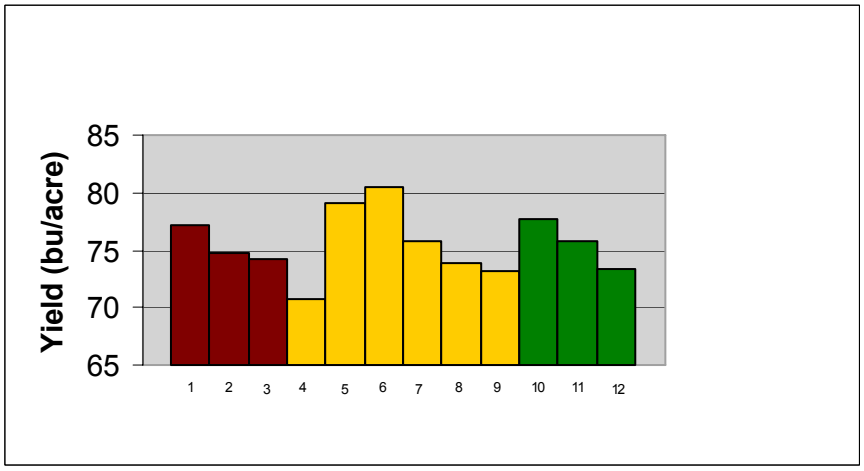


Figure 3: BARLEY: Effect of seeding rate and fertilizer rate on protein (%).

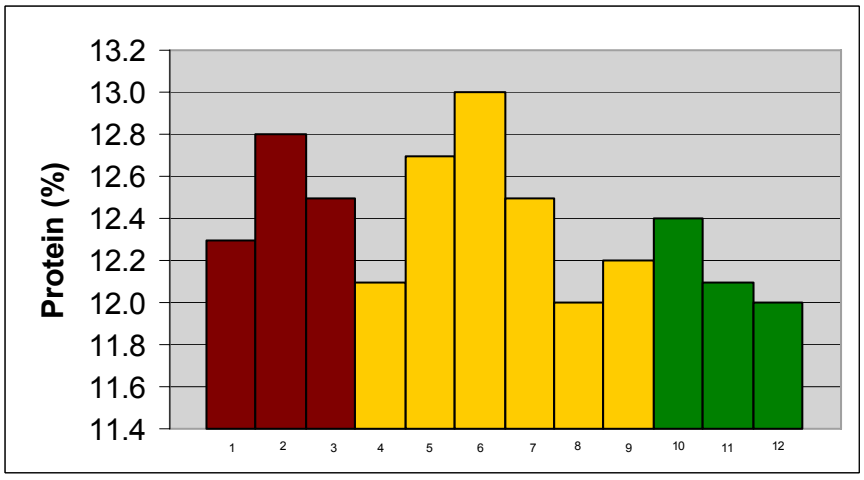
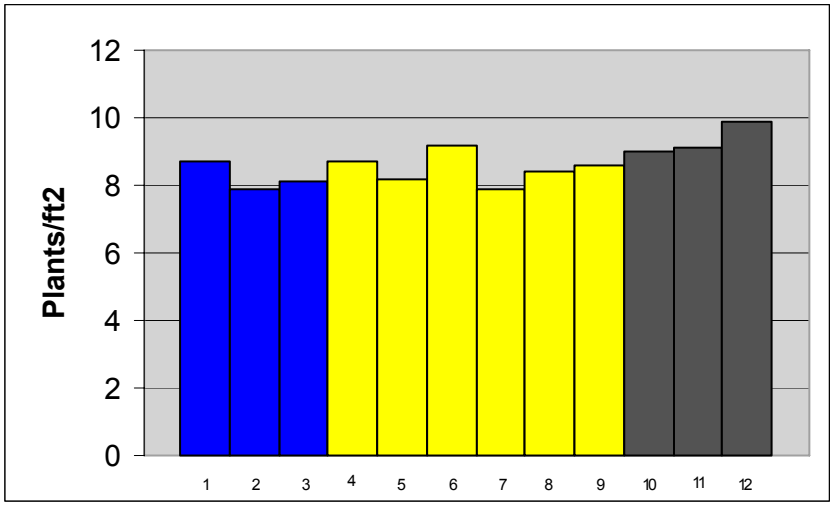


Figure 1: Effect of seeding rate and fertilizer rate on plants/ft².



4 lbs/acre

5.5 lbs/acre

8 lbs/acre

Fertilizer Treatments

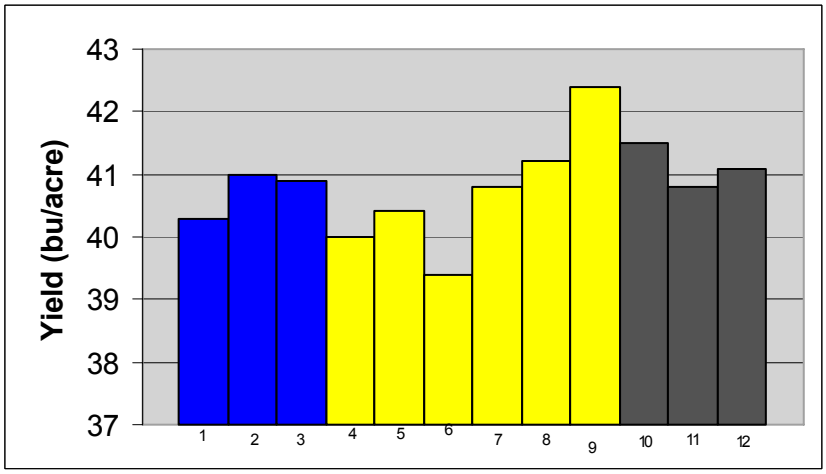
1 / 2 / 3
17 lbs/acre: 11-52
170 lbs/acre: 36-0-7-3-3

4 / 5 / 6
22 lbs/acre: 11-52
140 lbs/acre: 36-0-7-3-3

7 / 8 / 9
14 lbs/acre: 11-52
200 lbs/acre: 36-0-7-3-3

10 / 11 / 12
17 lbs/acre: 11-52
170 lbs/acre: 36-0-7-3-3

Figure 2: Effect of seeding rate and fertilizer rate on yield (bu/acre).



Conclusion

Even though the highest seeding and fertilizer rates had the highest plant populations, the yields were not significantly higher than the other treatments. The competitive advantage and subsequent higher yields may not have been seen in these treatments due in part, to the generous rainfall received in the 2006 growing season.

Thank-you cooperator Cornie Teichroeb and Reduced Tillage Linkages Agronomist, Nick Underwood.

Winter Wheat Trial

Funded by Ducks Unlimited Canada

Take Home Message

For many years, the production of winter wheat has been concentrated in the southern areas of Alberta. Currently, there is limited production of winter wheat in the northern areas of Alberta but these acres are increasing. Winter wheat offers producers several advantages: it provides soil cover during the fall and winter, reducing the potential for wind and water erosion; spring moisture is not lost from seeding disturbance, seeding and harvest dates are off-set to different times of the year and winter wheat often out-competes spring emerging weeds. If you are considering growing winter wheat the most critical rules to follow are: seed early, seed shallow and seed into standing stubble.

Objective

- To determine if winter wheat varieties perform well under local growing conditions from measurements of plant emergence, grain yield and forage production.

Materials and Methods

Four varieties of winter wheat were directly seeded (depth 3/4") on August 17, 2005 with a Conserva Pak air seeder into canola stubble. These varieties included: AC Bellatrix, CDC Falcon, CDC Osprey and Norstar. A mixture of 27-12-9-4 granular fertilizer was added at a rate of 90 lbs/acre. Plots measured 12' width by 40' length. Varieties were seeded in a randomized block design with four replicates.

Plant emergence counts were completed on May 15, 2006. Emergence (% plot) was averaged over the four plots per variety: CDC Falcon: 66%, CDC Osprey: 62%, Norstar: 56% and AC Bellatrix: 52%.

The trial was sprayed with Buctril M at recommended rates on June 19, 2008 with a 12' Hardi tractor mounted sprayer. Due to heavy weed pressure and lack of adequate plot growth, this trial was removed with the Hege Combine on August 17, 2006. Yield and forage production data was not measured.

Results and Discussion

The establishment of the winter wheat varieties was consistent from what has been observed in past research trials near Fort Vermilion. Good snow cover during the winter is key for increased winter survival rates.

The main issue in this trial was the heavy spring weed pressure. Although this trial was seeded into canola stubble (Roundup Ready) and a pre-seed burnoff was completed, it may have been necessary to spray for winter annual weeds later in the fall. Timing of herbicide application in spring is also an important factor for weed control.

For more information on growing winter wheat contact: Reduced Tillage Linkages or Ducks Unlimited Canada 780-489-2002.

Alternative Crop Choices: Growing Sunflower

Product provided by Pioneer Hi-Bred Ltd.

Take Home Message

Producers always have crop diversification options. However, whether a crop grows well in a particular area is dependant on many factors including climate, soil type, heat units and moisture availability. Every year, MARA establishes a demonstration trial with a crop that is not commonly grown in the local region to assess its establishment, maturity and harvest potential. In 2006, Pioneer Hi-Bred provided MARA with 63A21 sunflower seed. This crop established successfully on all sites. The sunflower crop did not reach maturity for seed production and ended up as silage. Lab analysis reveals that it has good value as feed.

Figure 1: Experimental Farm site.

Figure 2: Harvesting sunflower for silage.

Background

Sunflower is one of the few crop species that originated in North America (most originated in Asia and South or Central America). The first Europeans visiting our continent wrote about sunflower cultivation in many places from Canada to Mexico. Records indicate that the western native Americans domesticated the crop as early as 1000 BC.

Sunflower is an annual broadleaf that has a strong taproot. Its leaves are phototropic and will follow the sun. This characteristic allows the plant to increase light interception and photosynthesis. The sunflower head is not a single flower but a collection of 1,500-2,000 flowers joined at a base. Anthesis or pollen production begins on the outside of the head and progresses to the centre. Pollen movement between plants by insects is important for successful production.

Although typically harvested for its seed, sunflower can also be used as a silage crop. It is used in some areas as a double crop after early harvested small grains or as an emergency crop in areas with a season too short with early frosts. Research studies have documented that sunflower yields are generally less than corn but the nutritional quality is often higher. Crude protein levels are characterized as being similar to those of grass hay. Moisture content of sunflower at maturity is usually 80-90% and a wilting period is required before ensiling.

Materials and Methods

The demonstration trials were seeded with Pioneer Hi-Bred Ltd. variety 63A21 at three locations on the Experimental Farm near Fort Vermilion, AB on May 17, 2006. 63A21 is a

linoleic type sunflower. The sunflower was sown (2" depth) with a ConservaPak air seeder at a rate of 40,000 seeds per acre —exactly half a bag. Granular fertilizer, mixture 26-15-5-5 was added at a rate of 100 lbs/acre. Soil tests were taken in early spring and fertility decisions were based on these results as well as recommendations from crop specialists at the Ag Info Centre and Kansas State University.

The sites were clear of Ally, Lontrel, Gleaner or Atrazine herbicide treatments in 2005. Plant heights and condition were monitored throughout the growing season. Centurion herbicide (+ Amigo) was applied at a rate of 152 mL per acre on June 19, 2006. All three trials were harvested for silage on October 3. Samples were collected for feed analysis at Norwest Labs.

Results and Discussion

The establishment and growth of Sites 2 and 3 were rated excellent. Site 1 soil composition was higher in clay content and the ample rainfall received in June and July contributed to poor soil drainage. As outlined in Figure 3 the growth and yield were negatively affected. The sites were free of disease and insect damage. As noted in Figure 4, the lower crude protein levels corresponded with higher bird damage and subsequent missing seeds.

The decision to ensile the sunflower crop was made after two heavy frosts in late September. Plant moisture was monitored and by harvest date, the sunflowers had wilted down to about 78% water content. The ideal dry matter content for ensiling sunflowers is between 30-40%.

Figure 3: 2006 sunflower plant heights and yield.

Site	Yield (per acre) Wet basis	Heights (Range & Average)		Comments
Exp Farm 1	12.0 tons	95-155 cm	131 cm	Soil pH = 7.1. Poor soil drainage.
Exp Farm 2	15.6 tons	105-198 cm	160 cm	Soil pH = 6.9.
Exp Farm 3	21.1 tons	155-183 cm	168 cm	Soil pH = 6.8.

Figure 4: Feed Analysis of silage samples (as fed basis).

Site	Moisture	Dry Matter	Crude Protein	Acid Detergent Fibre (ADF)	Relative Feed Value
1	78.7 %	21.3 %	1.4 %	7.0 %	138%
2	79.7 %	20.3 %	2.9 %	7.6 %	140%
3	82.0 %	18.0 %	1.7 %	11.7 %	151 %

Reports from the cooperator have confirmed that the silage fermented well and was eaten by the cattle herd with minimal wastage. Ideally, when growing alternative crops a good management plan is to have an alternate crop use plan.

Thank-you! Cooperator Ron Wieler for harvesting and testing the silage as feed, Peter Wieler for use of your equipment, Blaine Calkins with Pioneer Hi-Bred Ltd. for seed and expertise and Norwest Labs for nutrient analysis.

Alfalfa Winter Hardiness Trial

Take Home Message

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 ensures good yields and healthy, vigorous and long-lasting stands. Severe winter conditions in Mackenzie County make variety hardiness a primary consideration in variety selection, therefore, varieties with very good winter survival should be strongly considered.

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 230 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 or more. The Experimental Farm in Fort Vermilion recently sod seeded into an Anik alfalfa stand that was estimated at twenty years of age (plant density was low). Understanding the factors that cause alfalfa losses can lead to higher productivity and stand life expectancy.

Winter Hardiness: 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 the best varieties suitable for Mackenzie County 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 to ensure equal area.

Roundup herbicide was sprayed at rate of **000ml/ac** and water volume of 40 L/ac on June 8. Alfalfa was harvested by forage harvester on June 30 (first cut) and August 29 (second cut) and all the alfalfa was measured for weight. Each samples were taken from the harvest and dried at 100ºF in an oven to calculate the dry matter.

Results and Discussion

Higher than average moisture conditions throughout the growing season of 2006 promoted excellent yield growth. Each alfalfa variety had higher yields compared to the previous year (Table 1 and Figure 1)—due to the adequate rainfalls received on the trial in 2006. According to data, varieties Anik and Peace had the highest yields. Each variety was taken as a sample and analyzed by Norwest Lab (Table 2 and Figure 2). There were no significant differences in nutrient content among alfalfa varieties.

Table 1: 2006 Yield of Alfalfa Varieties (total wet yield (tons/ac)

Variety	2006 wet yield (ton/ac)	Plants/m	seed germination rate	2005 wet yield (ton/ac)
Anik	**10.5**	20	49%	2.5
Peace	**10.2**	13	82%	5.3
Rangelander	**15.8**	11	48%	5.3
Algonquin	**7.0**	12	76%	7.0
Matrix	**6.2**	22	79%	5.4
Multi 5301	**5.6**	12	87%	4.9
Spredor 3	**5.1**	5	85%	5.3
Magnum 3801	**5.0**	17	94%	5.1
Forecast	**5.0**	13	89%	5.2
Spredor 4	**4.0**	5	86%	3.7
LSD (P=.05)	**5.29**			
CV	**26.06**			

Figure 2: Alfalfa Nutrient Analysis (harvested in June 30.—first cut)

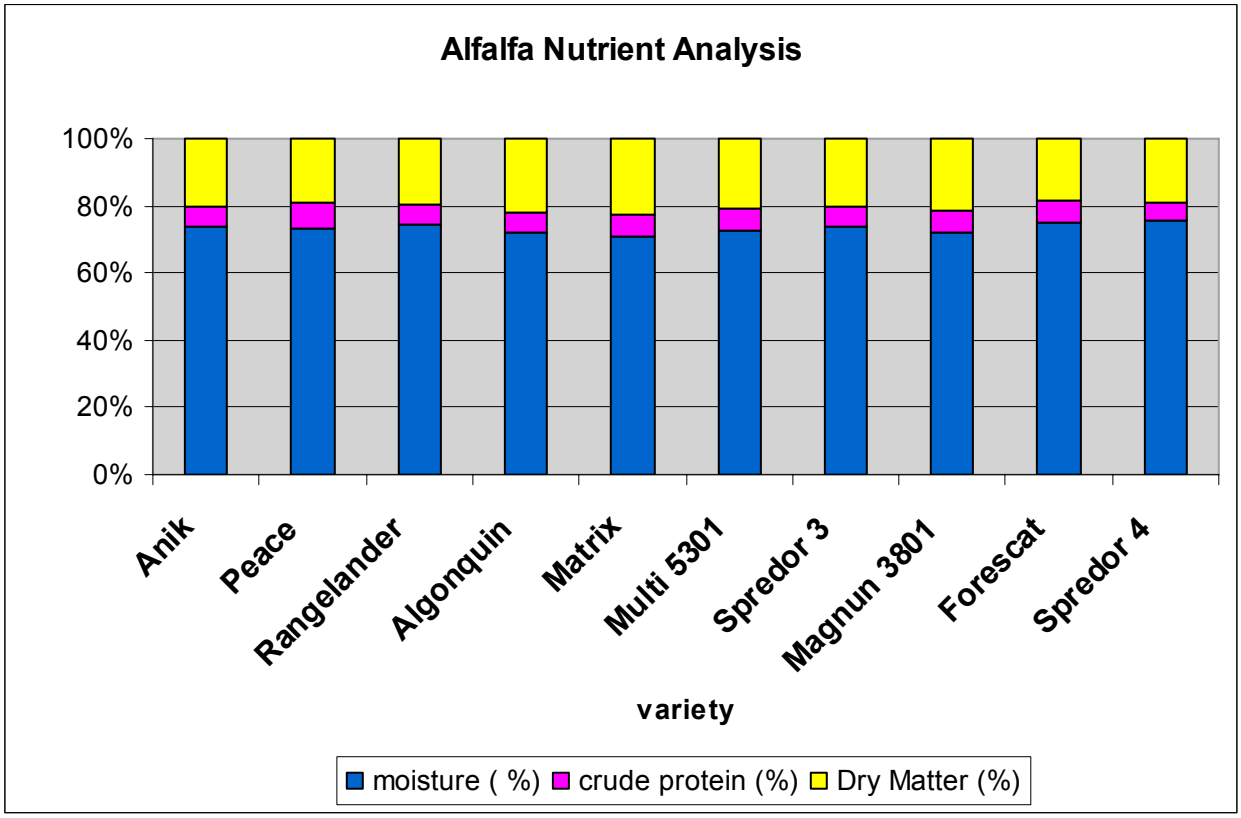
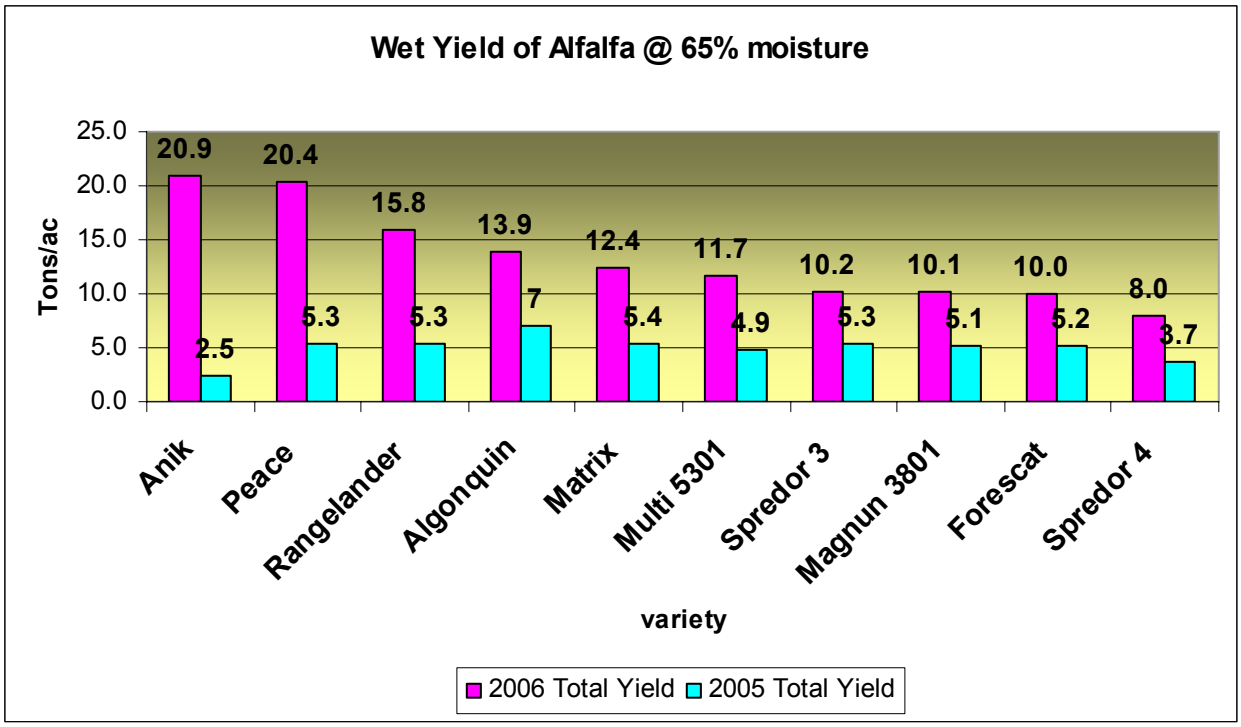


Table 2: Alfalfa Nutrient Analysis (harvested in June 30. first cut analyzed by Norwest Labs)

Variety	moisture (%)	crude protein (%)	Dry Matter (%)
Anik	68.4	5.8	18.5
Peace	61.3	6.3	16.2
Rangelander	70.6	5.6	18.9
Algonquin	73	6.1	22.5
Matrix	70.7	6.7	22.8
Multi 5301	67.9	6.2	19.5
Spredor 3	70.8	5.7	19.6
Magnum 3801	68.2	6.4	20.2
Forecast	65.4	5.6	16.1
Spredor 4	69	5.3	17.2

Figure 1: Comparison of 2006 Total Wet Alfalfa Yield and 2005 (Moisture at 65%)



Conclusion

The data presented in any variety trial must be considered carefully. Sound research is the culmination of at least two years of data and even then, environmental conditions may be highly variable so the results of a trial will also vary. For certain, a variety that performs well under adverse conditions will do consistently better under ideal conditions.

Although not the highest yielding in 2006, variety Algonquin has performed consistently well in the past two year, based on yield assessment.

Literature Cited

www.agric.gov.ab.ca
www.gov.on.ca

Corn for Silage in Northern Alberta

Introduction

Corn is an excellent forage crop due to its characteristics of being energy dense feed per acre, high yielding and palatable. While it has been typically grazed in this area, it can be harvested rapidly for silage and stored directly at time of cutting when its plant characteristics are ideal. Its growth characteristics allow it to produce high yields with high feed nutrient values. However, intensive management, sufficient soil fertility, adequate water and heat must be available for a successful crop.

Corn should be seeded as early as possible to make maximum use of available heat units. Weed control is an early requirement because corn is a poor competitor with weeds in its early stages of growth. Glyphosate tolerant varieties are an option to consider. Corn is also capable of utilizing high levels of soil nutrients caused by many years of manure application, even in areas that may cause problems for cereal crops.

Harvesting a corn crop at the appropriate stage of development will make it a high quality silage, even more so than cereal forages. However, growing conditions must allow the corn to reach the half-milk-line stage of kernel development or yield and quality will be compromised. Research studies indicate yield reductions of up to 50% when ear (cob and kernel) development do not occur. This will double the unit cost of the forage. Similarly, the combination of very low yields and high production costs may double or even triple the cost of feed. Higher costs can sometimes be returned through better feed quality but managing to obtain maximum yields remains your best option. (www.agric.gov.ab.ca/wfbg7469).

Objective

- To evaluate corn growth and use for silage under northern Alberta conditions.

Materials and Methods

All corn varieties were seeded on May 8, 2006 with a John Deere four-row corn planter (36" spacing). Seeding rates varied with each variety but averaged at 20,000 kernels per acre. Soil tests were used to determine that 60 lbs actual nitrogen was necessary for adequate fertility.

The plots were approximately one-half mile in length and varied in width from four to twelve rows of corn, depending on the amount of seed available. After plant emergence, the soil was cultivated with a conventional row-crop cultivator. The discs, four inches apart in width, cut the soil away from the plants and shanks moved the soil back towards the plants.

Plant heights and samples were taken from each plot one week prior to harvest. Norwest Labs completed the sample analysis. Harvest was completed on September 18 with a 980 New Holland three-row harvester. Silage was trucked away and packed immediately in a pit near the feeding site.

Results and Discussion

All varieties germinated well. Rainfall throughout the growing season attributed to excellent plant growth. Table 1 outlines the yields (tons/acre—wet basis), heights and % plant weight from cobs for each corn variety and Figure 2 / Table 2 displays the feed analysis results from Norwest Labs.

Table 1: Yield, Height and Cob Weights

Variety	Type	Wet Yield (Tons/ac) @ 65% moisture	Height (m)	Corn cob weight (%)
Pick Seed 223	RR	23.4	2.36	38.5
39H84	Conventional	18.1	2.81	62
39H83	RR	17.0	3.27	51.4
39M26	RR	16.5	2.75	72.3
39B93	Conventional	15.5	2.94	51.9
39A94	Conventional	15.0	3.03	56.7
Pick Seed 2230	Conventional	14.1	2.5	61.8
39F45	Conventional	13.1	2.89	51.9
39T67	RR	12.9	3.11	39.7
C.V.		**19.91**		

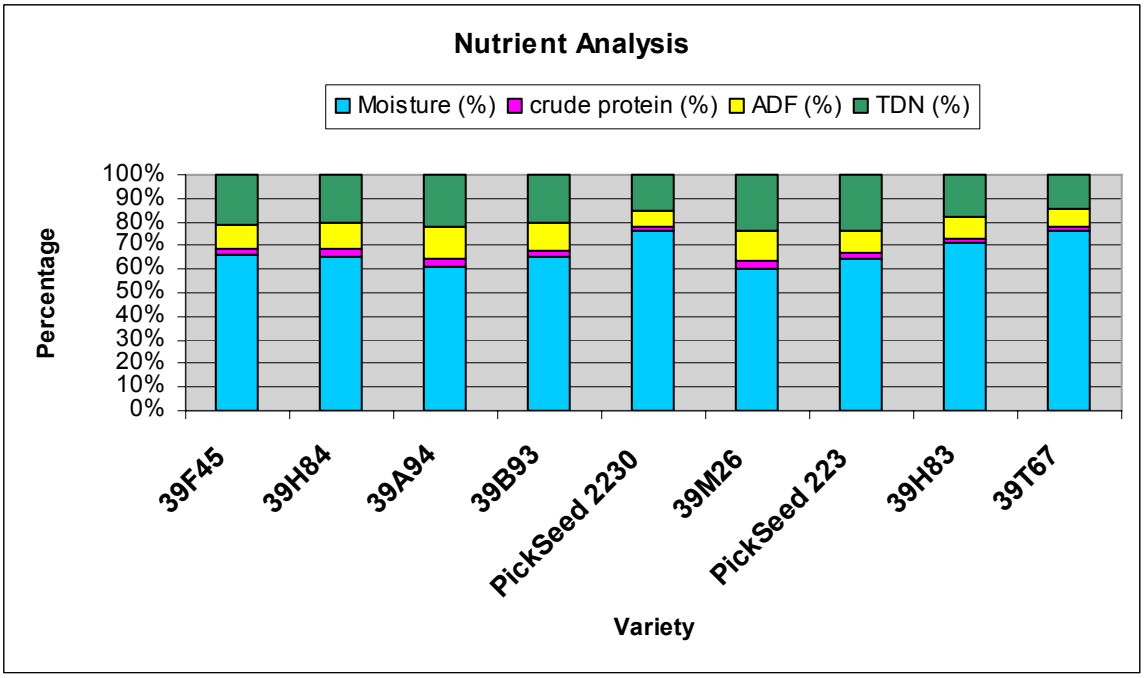
Table 2: Corn Nutrient Analysis by Norwest Labs

Variety	Type	Moisture (%)	crude protein (%)	ADF (%)	TDN (%)	Dry Matter (%)
39M26	RR	62.7	3.5	13.0	24.64	21.1
39F45	Conv.	67.6	2.8	10.5	21.78	18.3
39H84	Conv.	67.9	3	12	20.79	18.2
39A94	Conv.	63.9	3.2	14.4	22.99	20.7
PickSeed 223	RR	65.3	3	9.5	24.11	19.6
39B93	Conv.	67.7	2.8	12.2	20.84	18.3
39H83	RR	72.5	2.1	9.1	18.42	15.5
39T67	RR	78.2	1.8	7.9	14.3	12.4
PickSeed 2230	Conv.	77.3	1.8	6.3	15.72	12.8

PickSeed 223 yielded significantly higher (tons/acre) than the other varieties. 39H84 was the next highest yielding corn, but it was closely followed by the rest of the varieties. The Crude Protein (CP) level or the total protein content of a feed as determined by measuring nitrogen content were highest in varieties 39M26 and 39A94. Varieties 39H84 and PickSeed 223 had similar crude proteins and the rest of the corn varieties fell below 3%.

The Acid Detergent Fibre (ADF) consists of lignin and cellulose and is the least digestible portion of a roughage. The highest ADF % was held by the varieties 39A94 and 39M26.

Figure 2: Corn Nutrient Analysis (Harvested September 18)



August Tour. Pioneer rep Blaine Calkins.

September 18 harvest at P. Wieler's.

September 18 harvest at P. Wieler's.

Harvest Inspector "In-Training"—Jessie.

Variety		Cost (1 bag)
Pick Seed 223	RR	$184.00
39H84	Conventional	$174.90
39H83	RR	$174.90
39M26	RR	$172.90
39B93	Conventional	N/A
39A94	Conventional	$139.90
Pick Seed 2230	Conventional	$168.00**
39F45	Conventional	$129.90
39T67	RR	$164.90

Note: All corn seed has been treated with Pancho.
Pick Seed 2230 has been treated with Maxim Excel**.

Please contact your local Pioneer or Pick Seed representative for more information. Prices listed are only a cost guideline.

Kelly and Blaine measuring corn heights.

Highway view of the corn site.

Conclusion

The growing conditions were ideal for corn in 2006. An early spring allowed early seeding and favorable moisture conditions contributed to excellent growth of all varieties. The quality of the varieties varied but all proved to have adequate forage potential. The major risk factor is the environment, this was the third year for this corn site (although this is the first documented by MARA) and each year establishment and yields proved to vary considerably. The 2004 season proved to be antagonistic to growing corn, although it was a hot summer the lack of moisture throughout the growing season limited growth.

A producer must consider many points when deciding to grow silage. Availability of equipment and operators and seed can increase your production costs rapidly, especially if the silage yields are compromised by production or weather factors. In a year such as 2006, the silage yields more than paid for the seed costs.

Feed analysis is recommended. There should not be guessing when providing forage to your animals to ensure that they have all the necessary nutrients for optimal growth and health. Some producers use a ration balancing software such as Cow Bytes or consult with a feed specialist.

Thank-you! Cooperator Peter Wieler, Harvest / Mechanic crew Peter Wieler, Jr., Ron Wieler and Richard Marten and Pioneer Hi-Bred (Blaine Calkins) for seed and field day support.

Turnips for Grazing

Take Home Message

Turnips produce a high-quality forage. There are many varieties of forage available to livestock producers and many are still being tested for their suitability to the growing conditions of this area. Turnip must be seeded shallow and sufficient moisture must be received for good re-growth. In ideal moisture conditions, they can be grazed frequently with excellent re-growth.

Background

Turnip (*Brassica rapa L.)* is a root crop that has used for livestock feed for over 600 years. There are several types of turnip on the market, but they are classified into two categories: leafy-type and bulb-type. As for cattle preference, it depends on the adaptability of the variety to your particular region and the time that the forage is grazed. Both leafy and bulb types have been grazed in the Peace region from Fairview to Fort Vermilion.

Turnip produces a high-quality forage and can be grazed 1-3 times in our season with adequate rainfall for re-growth. In previous trials around Fort Vermilion, they have proven to be drought tolerant (though establishment and re-growth is fair) and cold-tolerant (cattle will pull turnips from the frozen ground). Late planting will provide extended grazing periods well into October.

Materials and Methods

The turnip (Pick Seed variety Apin—leafy type) was seeded on May 23 with a ConservaPak air seeder at a cooperator site south of the Experimental Farm. The soil had been cultivated, ideal in theory since turnips need loose and well-aerated soil for good establishment and manure had been applied that spring to approximately half of the seeded area. The seeding depth was targeted at 1/2" because of the small seed size. Half of the trial had manure applied and fertilizer mix 25-6-5-5 was added at a rate of 75 lbs/acre to the rest of the trial. The site was monitored throughout the summer and samples were collected to assess yield. This site was grazed twice in 2006.

Results and Discussion

When the turnips germinated, the crop stand was not uniform in establishment. This was attributed to a deeper seeding depth than desired due to the loose soils from cultivation and manure incorporation. Also, key moisture was lost at seeding.

The turnip stand was grazed in July and again in late August. The re-growth prior to the second grazing was poor, mainly due to the lower rainfalls received in late summer. At first the cattle were wary of eating the crop but the grazed it without exhibiting pickiness.

Figure 1: Seeding the turnips.

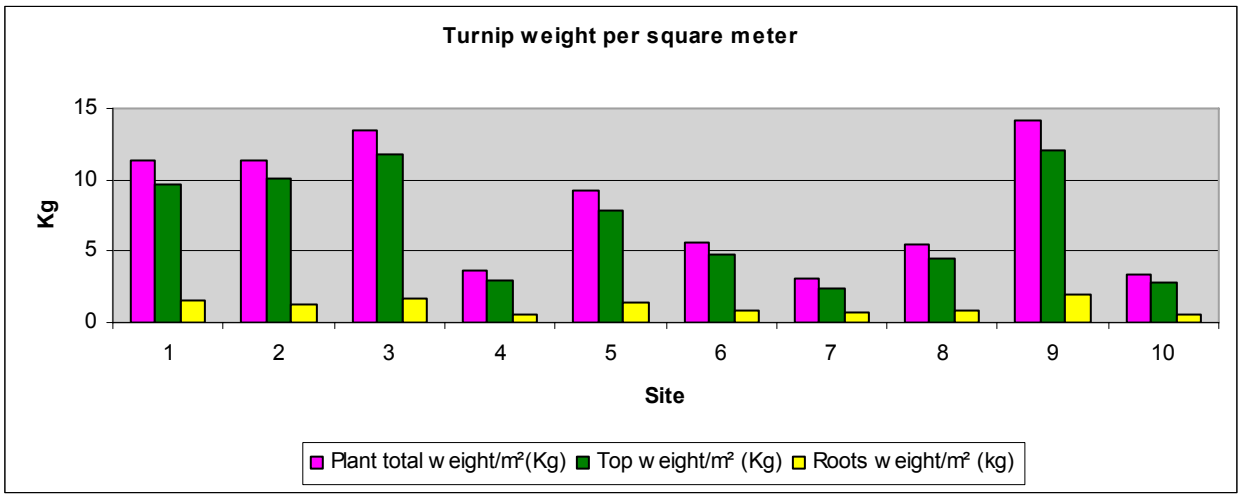
Figure 2: Turnip plant.

The following two tables outline the yield assessments on the turnip trial. The yellow area represents the manure treatment while the white is the granular fertilizer treatment. The manure yields were higher (average 9.82 kg/m²) compared to the granular (average 6.30 kg/m²). Manure contains beneficial microbes for plant root establishment.

Figure 3: 2006 turnip yields (kg/m²) and proportion of top and bottom growth.

Sample	Plant total weight/m²(Kg)	Top weight/m² (Kg)	Roots weight/m² (kg)	# of plants /m²
1	11.3	9.7	1.6	12
2	11.4	10.2	1.25	21
3	13.5	11.8	1.75	17
4	3.6	3.0	0.6	5
5	9.3	7.9	1.4	8
6	5.6	4.7	0.9	8
7	3.1	2.5	0.65	4
8	5.4	4.5	0.9	10
9	14.1	12.1	2	23
10	3.3	2.8	0.5	6

Figure 4: Graph representation of yields (kg/m²).



Conclusion

Turnips establish well in our area and have great potential to extend the grazing season well into October, therefore reducing feeding costs. Their successful establishment is dependant on shallow seeding depths and fertility management. Their suitability to this region from past trials has been good but that has been directly dependant on adequate and sustained rainfall throughout the growing season. The decision to grow these alternative crops to our region has been based on cost and producer preferences.

Thank-you cooperator Roger Toews and PickSeed representative Antonio Tejada for seed and expertise. Note: The cost of turnip seed is $4.20 / lb. Seeding rates are typically that of canola (5-7 lbs per acre). Call your local seed representatives for turnip seed pricing.

Reducing Cattle Wintering Costs—Swath Grazing

Funded by Alberta Environmentally Sustainable Agriculture (AESA) and the Agriculture Opportunity Fund

Take Home Message

The local concern about snow depth may limit swath grazing in mid to late winter during some years but it is only one piece of your management puzzle. The most important issue is forage palatability. Choose an annual that grows well on your particular land, aim for a later seeding date and be able to swath that crop in the soft dough stage. Feed value will be maximized. Swath grazing has proven to be a successful venture in our area. Fencing and water management are also necessary to maintain condition on your animals and limit feed wastage.

Best Management Practices (BMPs) for Swath Grazing

- Barley and oats are the most common crops used for swath grazing. Research has proven that high yielding grain varieties generally produce higher forage yields.
- Consider mixing oats and barley with fall rye. A benefit of using a mixture is increased swath quality and fall rye will re-grow after swathing providing leafy material for grazing.
- Delay seeding the cereal until late June. Increase seeding rates by about 25% to ensure stand density.
- Barley should be swathed at or before the soft dough stage and oats should be swathed at or just before the milk stage to maximize feed quality. Swathing should also occur late enough in the fall so that cool temperatures prevent mold growth on swaths.
- It is important to know the feed quality of the swaths to estimate the nutrition levels available. Supplemental feed may be needed, especially when swath grazing thin cows, young cows or cows with calves. Feed test your forage.
- It is best to take samples across the field rather than in one area. Feed analysis should include fibre content, protein levels, calcium, phosphorous and nitrates (if necessary).
- Controlling access to swaths will prove challenging. Use portable electric fencing to confine animals and force them to clean up the swaths (Agdex 420/56-1).

Figure 1: Swath grazing demonstration south of La Crete.

Best Management Practices (BMP) for Riparian Areas

Funded by the Greencover Canada Technical Assistance Program and Alberta Environmentally Sustainable Agriculture (AESA)

Take Home Message

Clean water is a key factor in maintaining healthy animals and maximizing gains. Direct access to streams, rivers and dugouts by livestock should be limited to preserve water quality and impacts on the environment. Over-grazing of riparian areas can increase runoff of sediment into water bodies. With a pasture dugout, direct access of cattle to the water will destroy the side-slopes and shorten its usefulness. Sediment may cause problems for aquatic life in rivers and streams. Manure deposits in water may expose animals and humans to pathogens. As stated on the PFRA website www.agr.gc.ca/water/wsystems: "Don't lose sight of the larger community and maximizing output should not take place at the expense of neighbours or the environment".

Best Management Practices (BMPs) for Riparian Areas

- Define your riparian area. Riparian areas exist between the aquatic part (river, stream, dugout) and the surrounding terrestrial (or upland) area. This is where water, soil and vegetation interact.
- Consider completing a Riparian Health Assessment (Public Lands, Cows and Fish: www.cowsandfish.org) to measure your impacts to vegetation and water quality.
- If you water cattle directly from or winter a herd near a water body, strongly consider setting up a remote watering system or moving your wintering site.
- Manure contributes excess nutrients to promote algae and plant growth in the water body and introduces disease-causing organisms such as bacteria, viruses and parasites.
- Sustainable agriculture means maintaining healthy soil and water quality. Gain knowledge about soil and water conservation without decreasing productivity.
- When designing your remote watering system consider the factors of cost, reliability, herd size, location, unique site characteristics and personal preference. Most common to this area are solar powered systems but you may consider checking out your neighbor for tips!

Figure 1: Solar-powered remote watering demonstration site located SW of Fort Vermilion (dugout).

Mercury Deposition Sampling

Funded by the Geological Survey of Canada

The atmospheric mercury flux (AMF) study is coordinated and supervised by researchers from the Natural Resources Canada (NRCan)/Earth Science Sector (ESS) through the Health and Environmental Program.

The objective of this study is to measure the flux of mercury (Hg) and other elements into the aquatic system (water bodies) through the wet deposition process (along with precipitation).

Mercury is a know human health issue mainly through the ingestion through contaminated fish. Mercury is subject of atmospheric transportation and is removed by dry deposition of particulate mercury and more importantly precipitation (wet deposition). The wet deposition is known to be the major pathway of mercury in the water bodies (and land), which is essential to be measured directly rather than relying on the often troublesome indirect measurement using the sediment profiles.

Wet deposition is measured during precipitation events using the standard wet mercury collector. Samples of wet deposition (rain and snow) is collected bi-weekly to analyze soluble mercury (Hg) content and other trace elements. Fort Vermilion has been chosen as a natural background site for Alberta. The results of the sampling from Fort Vermilion site will be linked to the other stations operating through the nationwide network.

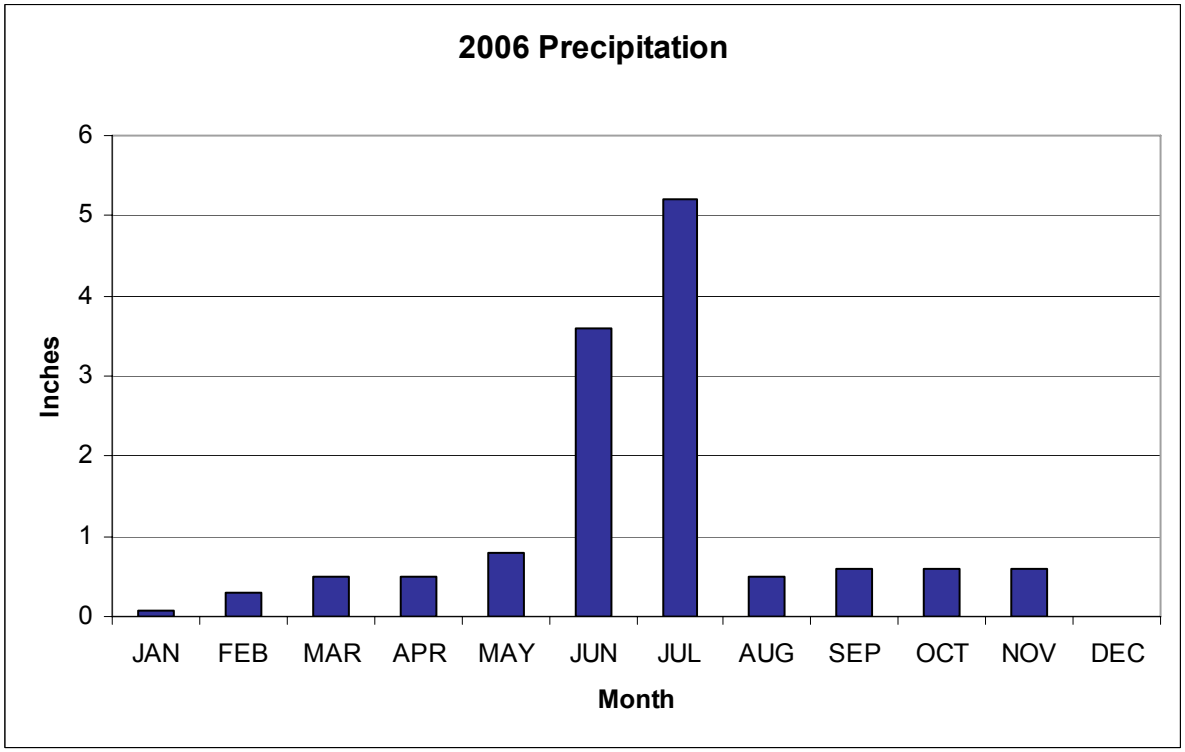
Over a two year experience in this study NRCan has developed a unique technical expertise for measuring mercury in deposition under Canadian winter conditions. They are adapting existing American technology (mercury deposition network (MDN) for the Canadian winter. NRCan—ESS has been instrumental in designing new instruments for mercury wet deposition, which applies a Programmable Logic Controller (PLC) which is a system in conjunction with a powerful linear acutator, and digital data logger.

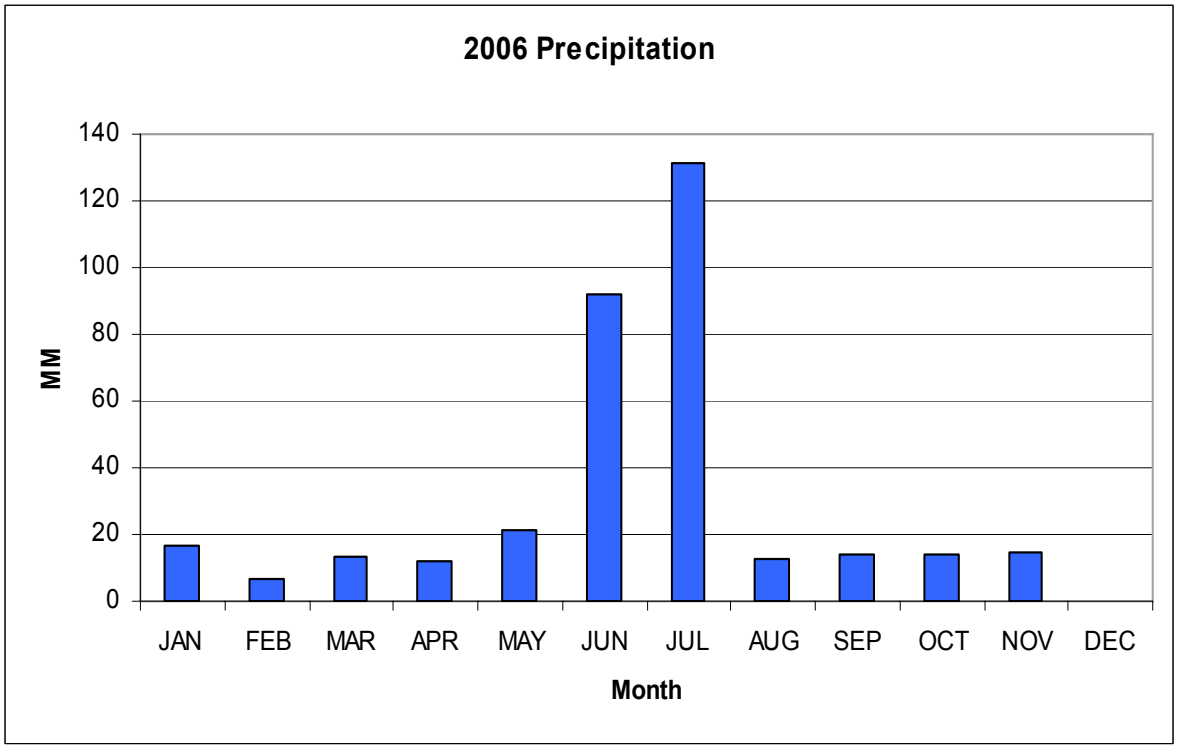
For more information contact Hamed Sanei, Ph.D with the Geological Survey of Canada. (Calgary office 403-292-7050).

Figure 1: Kelly collecting a sample.

Figure 2: Weather station.

2006 Precipitation Levels, Fort Vermilion.

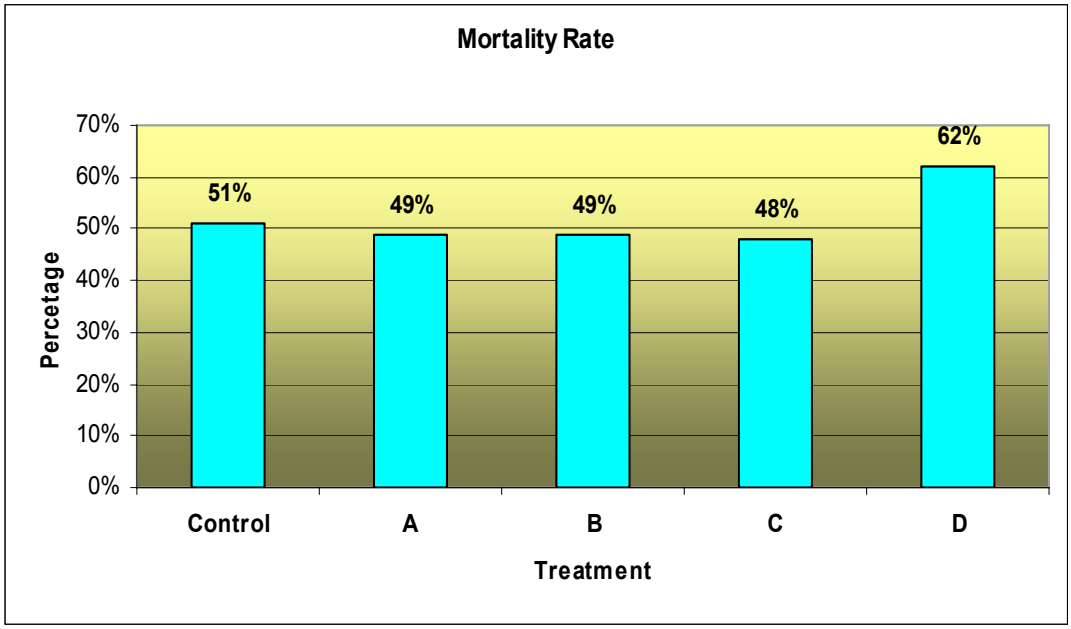




2006—Notes from other trials.

Maralroot Fertility Trial
The initial trial was established by plants supplied by ANHAN. MARA has been monitoring the completion and harvest of the trial on their own and will analyze the maralroot for active ingredients in 2007. We anticipate higher than normal levels of active ingredients due to the Northern Vigor phenomenon.

Figure 1: Cumulative mortality rates after three year establishment.



Soybean Demonstration
Cooperator Bill Boese seeded one 55 lb bag of soybeans on May 5, 2006. The seed variety 90M02 (untreated) was provided by Pioneer Hi-Bred Ltd. Germination and growth were rated as fair. Although the demonstration area was treated with Odyssey, the site became a bit messy from the heavy weed pressure. In retrospect, a second treatment with herbicides may have been necessary. The soybeans made it to maturity for harvest on September 17.

Sod Seeding Demonstration
A site was sprayed in August 2006 for a reduced tillage demonstration on sod-seeding. The site was an established grass pasture for over thirty years and will be seeded to canola and wheat in 2007. Funding provided by Reduced Tillage Linkages.

Better Management Practices (BMPs) in Riparian Areas
This site was prepared in August 2006 with cooperator Tony Batt in Rocky Lane. PFRA is investigating the in-soil movement and levels of phosphorus in riparian buffer zones seeded down to grass. Monitoring equipment will be set-up in 2007. Funding provided by PFRA.

Foliar Applications: Wheat Trial

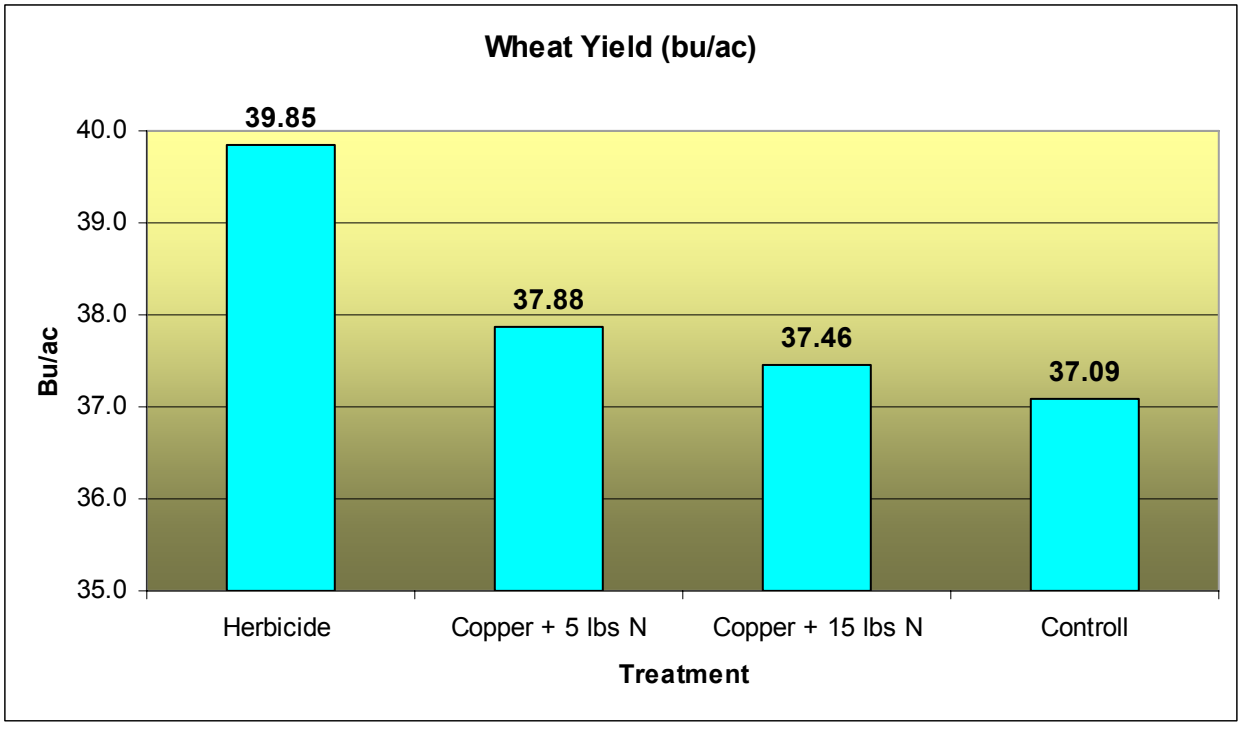
MARA staff followed cooperator Larry Wieler in 2006 to collect yield data on wheat and canola foliar applications of herbicides, fertilizer and copper and Ronalin and boron, respectively.

Plant tissue samples were collected from the wheat plants (flag leaf stage) to assess crude protein and copper levels. Appendix 4 and 5 summarize the data collected and statistically analyzed. There were no significant increases in yield from any treatment.

Figure 1: Wheat trial treatments, yields and plant tissue analysis.

	Roblin Wheat	Plant Tissue Analysis		Treatment		
Row	Yield (bu/ac)	Crude Protein (%)	Copper (ppm)	Copper	Fertilizer	Herbicide
1	**39.05**	26.0	14.4			✓
2	**39.37**	27.2	4.2			
3	**38.41**	27.0	50.0	✓	15 lbs N	
4	**40.64**	27.2	4.3			✓
5	**34.80**	25.4	4.6			
6	**37.88**			✓	5 lbs N	
7	**36.50**	26.5	46.5	✓	15 lbs N	
LSD at 0.05	**9.88**					
CV	**6.03**					

Figure 2: Graphical representation of wheat yields.

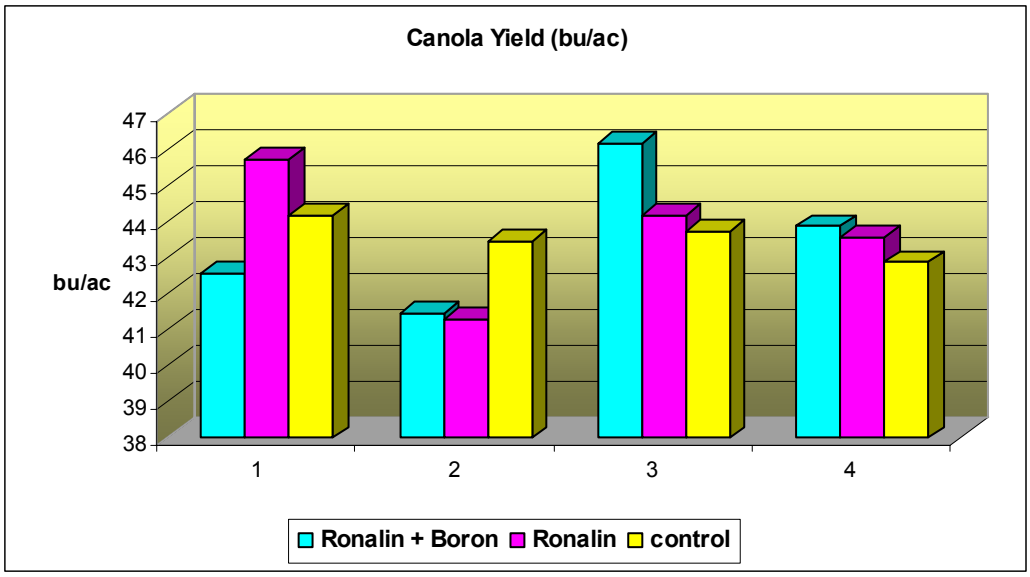


Foliar Applications: Canola Trial

Figure 1: Canola Treatments and Yield.

		Treatment		
Row	Yield (bu/ac)	Ronalin	Boron	Check
1	**42.57**	✓	✓	
2	**45.71**	✓		
3	**44.14**			✓
4	**41.43**	✓	✓	
5	**41.29**	✓		
6	**46.14**	✓	✓	
7	**43.43**			✓
8	**44.14**	✓	✓	
9	**43.71**			✓
10	**43.86**	✓	✓	
11	**43.57**	✓		
12	**42.86**			✓
LSD at 0.05	**2.48**			
C.V.	**3.19**			

Figure 2: Graphical representation of canola yields.



MARA does not endorse off-label uses of herbicides.

Alberta Environmentally Sustainable Agriculture (AESA) Farm Based Program

Rural Extension Staff: Kelly Zeleny

The AESA program consists of four components that are incorporated into MARA research and extension. 2006 marked the end of year two / three year funding.

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.

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.

Appendix 1: 2006 Regional Variety Trial, Hard red spring wheat protein levels (%).

ENTRY	HRS VARiETY	BEISE-KER	AU LETH IRR.	CASTOR	KILAM	LA-COMBE	TROCHU	LETH DRY	AC LETH IRR	ROBIN-SON	DAWSON
1	KATEPWA	11.7	14.2	14.0	15.8	14.7	11.8	13.8	14.1	13.6	14.5
2	AC BARRIE	11.0	13.4	12.8	16.1	14.7		13.7	13.3	13.3	16.3
3	AC SUPERB	11.0	13.9	13.4	15.1	13.7	12.5	13.7	13.7	13.9	14.7
4	CDC GO	11.4	14.2	13.7	15.1	14.1	12.6	14.2	14.1	13.9	15.5
5	CDC OSLER	9.7	14.8	13.9	15.8	15.3	12.1	14.2	14.7	13.8	14.8
6	PARK	10.5	14.3	14.2	15.6	14.3	12.3	14.4	14.2	14.0	14.6
7	INFINITY	11.6	14.1	13.9		14.5	11.7	13.3	13.1	13.5	14.6
8	CDC ALSASK	10.0	16.0	12.8	16.4	15.6	12.1	15.0	15.5	14.3	15.0
9	5602HR	10.6	15.9	14.0	16.0	15.5	13.9	14.7	15.4	14.7	18.0
10	PEACE	11.3	14.4	15.0		15.3	13.7	14.7	14.0	14.1	15.9
11	AC SOMERSET	11.3	15.0	14.1	16.6	15.6	12.9	15.0	14.4	1.3	15.9
12	BW 824	11.1	13.8	13.4	15.5	14.3	13.1	13.8	13.7	14.4	15.7
13	HARVEST	10.1	13.6	13.5	15.3	14.3	11.8	14.4	14.2	13.4	15.3
14	SNOWBIRD	11.2	14.1	13.4	15.6	14.7	12.6	14.0	14.3	13.5	15.4
15	KANATA	11.3	14.3	14.7	16.0	14.7	12.4	14.5	14.6	14.1	15.1
16	PT213	10.8	14.4	14.0	16.1	15.5	12.6	14.9	14.9	14.2	15.0
17	BW315A	10.9	12.5	12.5	14.7	13.1	11.0	12.5	12.4	12.8	14.2

ENTRY	HRS VARiETY	Fort St John	BIG LAKES	SM.RIVER	FT. VERM	B.LODGE	Lac La Biche	Bonnyville
1	KATEPWA	13.4	9.9	9.3	15.7	13.4	15.0	15.0
2	AC BARRIE	14.6	9.5	10.0	16.1	14.0	15.6	15.7
3	AC	12.9	9.0	9.7	15.1	13.4	15.6	15.6
4	CDC GO	13.7	9.2	10.5	15.7	13.2	15.0	15.3
5	CDC	13.4	9.1	9.9	15.5	13.5	14.9	15.2
6	PARK	13.8	9.6	10.7	15.8	13.9	15.3	15.0
7	INFINITY	13.6	8.8	8.9	15.5	13.4	15.7	14.3
8	CDC	13.4	9.4	8.4	15.6	13.1	15.2	15.3
9	5602HR	16.6	11.0	11.1	17.2	15.8	14.8	15.8
10	PEACE	13.9	10.8	10.6	14.8	14.5	14.8	13.6
11	AC	13.5	9.0	9.5	14.9	13.8	14.6	13.9
12	BW 824	13.7	9.7	9.6	15.6	14.1	15.1	
13	HARVEST	14.2	9.3	9.3	15.8	12.8	14.8	15.1
14	SNOWBIRD	13.8	9.6	9.4	16.1	13.2	15.6	15.0
15	KANATA	14.8	9.8	11.3	16.6	13.9	15.3	15.2
16	PT213	13.1	9.7	10.2	16.1	13.3	15.2	15.8
17	BW315A	13.2	9.5	9.4	16.0	13.5	15.2	15.2

Appendix 2: 2006 Regional Variety Trial, Utility wheat protein levels (%).

ENTRY	UTILITY WHEAT	Beiseker	Lethbrid Irrigate	Castor	Killam	Lacombe	Trochu	Lethbrid Dry	Robin-son	Dawson Creek	Ft. St. John
8	RUW4	HY 476	10.3	12.6	14.3	15.6	11.6	12.7	12.6	11.9	13.6
6	RUW4	AMAZON	12	14.2	14.1	16.8	11.4	12.7	12.6	11.9	12.8
7	RUW4	HY 475	10.5	12.7	14.3	16	12.1	12.8	13.5	12.6	14.2
1	RUW4	5701PR	11	12.5	13.6	16.1	12.1	13.3	12.5	12.1	12.8
4	RUW4	AC TABER	10.5	13.8	13.3	15.9	11.2	12.7	12.8	11.8	12.5
3	RUW4	Katepwa	9.7	12.5	14.4	15.6	13.3	13.9	14	14.1	15.2
5	RUW4	AC Bar-rie	11	13.8	14.7	17.4	13.6	14.2	14.2	14	14.9
2	RUW4	5700PR	12.2	13.1	13.2	14.7	11.5	12.1	12.7	12	13

ENTRY	UTILITY WHEAT	Big Lakes	Smoky River	Fort V	Beaver-lodge	AVERGAGES
8	RUW4	10.5	12.3	11.1	13.3	12.2
6	RUW4	11.1	11.5	11.5	14.1	12.7
7	RUW4	11.4	12.1	12	14.5	13.2
1	RUW4	11.1	12.5	11.4	12.8	12.7
4	RUW4	10	11.7	11	13.4	13.2
3	RUW4	12.5	13.4	13	14.9	13.4
5	RUW4	12.4	13.7	13.2	15.3	13.8
2	RUW4	10.6	11.7	11.1	12.8	12