



**2010 AgriARM Report
Applied Research and Demonstration
Prince Albert AgriARM Site**

Final Report



Overall Summary

Conservation Learning Centre

The Saskatchewan Conservation Learning Centre Inc. (CLC) is a producer-driven, non-profit corporation with formal status as a registered charity. The CLC was established in 1993 under the Parkland Agricultural Research Initiative, a component of the Green Plan. The CLC demonstrates, on a farm-scale, soil and water conservation technology. It also serves as a field laboratory for evaluation and applicability of new research and technology. The CLC is located on 457 acres of land 18 km south of Prince Albert in the Parkland Region of Saskatchewan.

Mission: The Saskatchewan Conservation Learning Centre Inc. (CLC) researches and demonstrates land management techniques which focus on the optimum utilization of the landscape for annual crops, forage, and agroforestry production, employ appropriate soil and water conservation techniques and facilitate wildlife habitat enhancement.

Mandate: To provide information to farmers, public school students, researchers, extension workers, and the urban public in the parkland area of Saskatchewan. The CLC will also facilitate interrelationships with all those interested in the objectives of the CLC including the agriculture and agroforestry industry, policy makers, and the media.

Objectives:

- To increase the awareness of farmers as to the importance of land management systems which include both economic and environmental stewardship. To be a leader in identifying and demonstrating agricultural practices that emphasize sustainability. To have farmers adopt these practices on their own farms.
- To increase the awareness of the interaction of agriculture and the environment among public school students.
- To have the urban public become more aware of how farmers practice stewardship on their farms. To have the urban public become aware of how agriculture and wildlife can co-exist. To have them understand the role and importance of the agriculture supply industry in food production.
- To provide researchers with a location to expand their plot research to field scale and/or landscape research. This will enable them to learn about and investigate applied research techniques, other research projects, new research needs, and the role of industry in the agri-food sector.
- To encourage the corporate sector and interested organizations to promote sustainable agriculture practices. To provide a site where researchers, industry, farmers, agroforesters, technology transfer personnel and the public can be brought together at one location.

In recent years, the CLC experienced a downturn in funding interest but with the support of AgriARM, ADOPT and the Saskatchewan Research Council, along with industry, we continue to develop new relationships while rebuilding old ones. The support has enabled the CLC to address some concerns that were preventing the organization in moving forward with its long term plans.

The recent addition of desperately needed equipment provides the CLC with added opportunities that attract even more participants to the farm. Our extension program is more aggressive so that results can be provided to producers and professionals in a timely manner while developing new opportunities. A state of the art weather station is also being installed in the fall of 2010 as a result of our partnership with the Saskatchewan Research Council.

One of the most unique features at the CLC is the School Program. Since the beginning, well over 23,000 students, along with hundreds of educators and chaperones, have experienced all the farm has to offer. Our program follows the provincial science curriculum and consists of a two hour tour where students from grades 3 to 11 are exposed to conservation techniques specific to each class's objectives. The program highlights where and how our food is produced while promoting the conservation of our soils, water and wildlife habitat.

In 2010, efforts to attract more industry players started to show results with several new partnerships established, including SeCan, DowAgro Sciences, Environment Canada and others. Results have been quite positive with most looking at maintaining this renewed relationship into 2011. An example of one of these variety trials allowed 93 producers to view another tool when it comes time to make their seeding choice.

AgriARM Research Sties

The CLC is proud to be a member of the AgriARM research site network and to assist AgriARM in achieving its own objectives (see below). The CLC and AgriARM objectives are often aligned and provide opportunities to producers to experience firsthand new and productive forms of agriculture. The funding received from AgriARM helps the CLC conduct trials for adoption by local producers. Once adopted, these new ventures help strengthen agriculture and rural communities while building a better Saskatchewan.

Agri-ARM's objectives

- Increase the adoption of new agricultural production technologies and practices;
- To provide farmers with more tools for environmental and economic decision-making;
- Develop and maintain an adequate level of infrastructure and expertise for regional applied research and demonstration; and

- Increase public awareness of agriculture's role in environmental stewardship and the overall economy.

Agriculture Demonstration of Practices and Technologies (ADOPT) Program

The purpose of the ADOPT program is to accelerate the transfer of knowledge to Saskatchewan producers and ranchers. The ADOPT program will provide funding to help producer groups evaluate and demonstrate new agricultural practices and technologies at the local level. The results of successful trials can then be adopted by farming operations in the region

2010 ADOPT and AgriARM List of Projects

- Varietal Selections of Dwarfing Winter Hardy Apple Rootstock.
- Fertilizer Effects on Malt Barley
- Optimum Seeding Dates Camelina
- Investigating Crop Development Opportunities in North Central (NC) Saskatchewan
- Demonstration of New Varieties for NC Saskatchewan
- Fall vs Spring Planting of Haskap
- Fall Seeding Trends (postponed)
- Agronomics of Alleycropping

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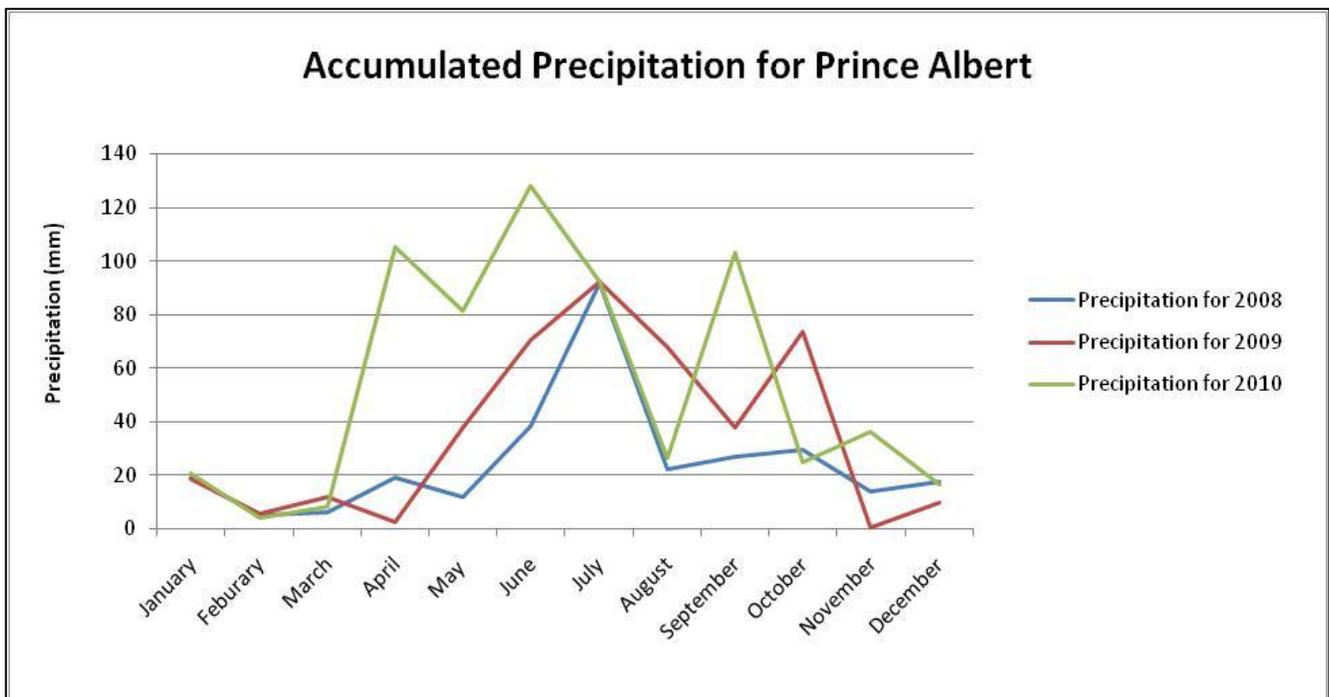
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General Site Conditions

The CLC is situated 18kms south of Prince Albert. Soils are considered to be silty clay, but are quite variable; the landscape is hummocky with several potholes. Knolls are primarily sandy and hollows are mostly heavy clay. Weed pressure is high and weed control difficult as a result of large adjacent riparian areas which interfere with timely herbicide applications, especially in the recent uncommonly wet years.

Of the 457 acres at the CLC, 150 acres were rented for annual crop production and 307 acres are dedicated to research plots. This season, oats was the dominant annual crop.

In 2010, the CLC was faced with difficult conditions as a result of the weather. Spring seeding was delayed due to excessive moisture. Some plots were impacted as a result of very heavy rains following seeding. With cool wetter weather into late spring and early summer, crops were delayed and some yield loss resulted.



Summary of Activities from 2010

Four sites were generated away from the main CLC operation as a result of the need for either larger plot size or more northern location. These sites were located three miles west of the CLC and near Henribourg, Green Lake and Ile-a-la-Crosse.

Activity	Type of Activity	Project Title	# at Event	Year Initiated	Ongoing	Demo / Research
1	Horticulture	Living Snow Fence	82	2008	yes	Demo
2	Agriculture	Forage Corn Demo	82	2010		Demo
3	Agroforestry	Alleycropping	24	2010	yes	Research
4	Horticulture	Honeysuckle Varietal Selection	82	2008	yes	research
5	Agroforestry	Slope Stabilization	23	2009	yes	Demo
6	Horticulture	Demonstration Orchard	82	<2008	yes	Demo
7	Agriculture	ULV Spraying Demo	31	2010		Demo
8	Agriculture	Canola Variety Trial	102	2010		Research
9	Agriculture	Midge Tolerant Wheat	82	2010		Demo
10	Agriculture	Greenfeed	119	2010		Demo
11	Agroforestry	Minor Use Registration	119	2010		Research
12	Agriculture	Fertility Demo (BEST)	82	2010		Demo
13	Agriculture	Fertility Demo (Back to Roots)	82	2010		Demo
14	Agroforestry	Ecobuffer	119	2010	yes	Demo
15	Agroforestry	Biomass Trial	119	2008	yes	Research
16	Agroforestry	Afforestation	119	2008	yes	Demo
17	Agroforestry	H. Poplar Clonal Trial	119	2008	yes	Research
18	Agroforestry	H. Poplar Stooling Bed	119	2009	yes	Demo
19	Agroforestry	Willow Variety Trial	119	2009	yes	Demo
20	Agriculture	Cow Cackle Trial	82	2010		Research
21	Agriculture	Camelina Seeding Date Trial	119	2010		Demo
22	Agriculture	Fertilizer Effects on Malt Barley	119	2010		Demo
23	Agriculture	Crop Development Opportunities	119	2010		Demo
24	Horticulture	Apple Rootstock	132	2010	yes	Demo
25	Horticulture	Fall Haskap Planting	9	2010	yes	Research
26	Agriculture	New Crops	119	2010		Demo
27	Agriculture	Fall Seeding	0			Demo

Research Activities 2010

ADOPT Trials

- Camelina Seeding Date Trial
- Fertilizer Effects on Malt Barley
- Varietal Selection of Dwarfing Winter Hardy Apple Rootstock
- Investigating Crop Development Opportunities in NC Saskatchewan
- Demonstration of New Crop Varieties for NE Saskatchewan
- Fall vs Spring Planting of Haskap
- Fall Seeding Trends (postponed)



Figure 2. CLC Field Day, July 2010

AgriARM Trials

- Agronomics of Alleycropping
- Forage Corn Demo
- Living Snow Fence
- Varietal Selections of Blue Honeysuckle (Haskap)
- Slope Stabilization
- Demonstration Orchard
- ULV Spraying Demo

Industry Trials

- Dow AgroScience: Canola Variety Trial (3 miles west of CLC)
- SeCan: Midge Tolerant Wheat Demo, CLC
- SeCan: Greenfeed Trial, CLC
- PMRA: Minor Use Registration, CLC
- Back to Your Roots: Fertility Demonstration, CLC
- B.E.S.T.: Fertility Demonstration, CLC
- Saskatchewan Research Council (SRC): Balsam Poplar Progeny Trial
- SRC: Eco-buffer
- SRC: Biomass Trial
- SRC: Afforestation

- SRC: Hybrid Poplar Stooling Bed
- SRC: Willow Variety Trial
- Agriculture and Agri-Food Canada/Agri-Environmental Services Branch (AAFC-AESB) and SRC: Hybrid Poplar Clonal Trial

Others

University of Saskatchewan, Cow Cockle Trial, CLC

Extension Activities 2010

Summary of CLC extension activities.

Activity	Estimated attendance
Annual Summer Tour	82
Dow AgroScience Tour	93
District 32 ADD Board tour	24
Sask Ag Crop Centre Tour	28
First Nation Apple Workshop	13
Unstructured Tours	6
School Program Tours	1001
Total	1247

Other extension activities included:

Crop Production Show

SK Soil Conservation Association (SSCA) Convention

Web site updates

Of special note in community recognition, the CLC was awarded the 2009 Samuel McLeod Prince Albert Business Environment Award. The Samuel McLeod Environment Award is awarded *to a business that demonstrates excellence in the development of innovative programs, products and/or services offering improvement for environmental purposes. Improvements may be related to soil, air, water, noise or visual pollutants or energy conservation.*

Research Results 2010

The Conservation Learning Centre was involved with over 25 trials in 2010 at five different locations with most of them conducted onsite at the CLC.

AgriArm and ADOPT Projects Initiated in 2010

Optimum Camelina Seeding Dates Conservation Learning Centre

Introduction

Approximately 25,000 acres of this crop are grown in Saskatchewan with acreage doubling each year as producers gain knowledge and experience in growing this crop. Further advancements in knowledge of crop agronomics, such as seeding dates, will help growers decide on the fit of camelina in their crop rotations. Camelina appears to have an advantage over other oilseed crops in drier areas of the province where other oilseed crops do not perform as well. Its early maturity is a good fit for utilizing winter cereals in a crop rotation plan.

Project Description

The objective of this project was to demonstrate the most suitable spring seeding date for the new oilseed crop – camelina. As camelina is a new crop to Saskatchewan, producers are just beginning to understand the agronomics. Seeding date is one of the agronomic elements that can play a role in establishment and yield potential of camelina. As camelina is a small seeded crop with poor weed competition early in its lifecycle, an early seeding date is important in order that crop seedlings are better able to compete with weed seedling for nutrients and moisture, ensuring a higher plant survival rate. Camelina is short season crop,



Figure 2. CLC Field Day, Camelina trial, July 2010

therefore maturity is early which allows producers to spread their work load and enhance production efficiency. Five different seeding dates were chosen to compare germination, emergence counts, maturity ratings, height, grain yield and kernel weight. Unfortunately, results were severely affected due to unusually wet spring weather conditions.

The CLC had over 100 people visit this demonstration during the CLC Annual Field Day and District 32 ADD Board's forage day.

Project Results

Date	Seed Germination	Emergence	Maturity Ratings	Plant Height	Grain Yield	Kernel Weight
May 12		May 17				
May 17		May 21e				
May 27	-	-	-	-	-	-
June 1	-	-	-	-	-	-

Notes:

Heavy rains and wet conditions delayed the start of this project and interfered with the ability to meet project objectives.

The seeding dates of both May 27th and June 1st were followed by heavy rains making it impossible to observe any results.

Fertilizer Effects on Malt Barley Conservation Learning Centre

Project Summary

The objective of this project was to demonstrate the effects of different application rates of nitrogen on the grain protein level of new varieties of barley suited for NE Sask. Some new variety releases show signs of maintaining low protein levels when higher rates of nitrogen are applied. The results could provide producers with the choice of a new barley variety tolerant of higher nitrogen fertilizer rates in order that increased yields can be achieved while maintaining lower grain protein levels and higher carbohydrate content that is preferable in the malting process. The impact of these results would be adoption by producers of these new malting varieties.

Project Methodology

Four rates of nitrogen (N) fertilizer were chosen for application to X varieties, in randomly replicated plots. Fertilizer rates of N were determined by soil sampling.

- Plot A received 1X the recommended rate of N,
- Plot B received 1.5X the recommended rate of N,

- Plot C received 2X the recommended rate of N, and
- Plot D received 2.5X the recommended rate of N.

Following harvest, 1 metre samples will be taken from all 4 plots and be measured for protein content and yield.

Project Results

Due to excessive rains over the 2010 growing season and heavy winds, the barley crop lodged. As barley seed heads were lying in moist conditions, germination occurred, the desired measurements were unattainable and the season's results were lost.

Varietal Selections of Dwarfing Winter Hardy Apple Rootstock. Conservation Learning Centre

Project Summary

A variety of different dwarfing apple rootstock, selected by the University of Saskatchewan, will be planted in trial plots to determine winter hardiness and susceptibility to disease. The project will be conducted over several years with most costs occurring in the first two years. Two locations were chosen for this project: the CLC farm site (Plant Hardiness Zone 2b) and north of Henribourg (Plant Hardiness Zone 1a). The Henribourg site is one zone colder than the CLC and it is expected that winter hardiness parameters will be challenged. At present, dwarfing apple rootstock does not display winter hardiness suited to these zones and is susceptible to diseases such as fire blight. As this project progresses and winter hardy dwarfing apple rootstock is selected, access to this variety will reduce the risk of crop loss due to winter kill. This project will provide producers with better alternatives than are currently available in the marketplace and enhance adoption of this crop.

Project Methodology

Different rootstocks will be planted within an area protected from deer damage by a fence. The fence is to keep the deer from browsing the new growth of the rootstock. We propose replicating the plot design three times with each variety of rootstock supplied from the U of S. in the first year, weed control within the rows will be done by hand and between the rows with glyphosate using an Enviromist sprayer. At the end of the first growing season, fruit budding should be complete (August of 2010) and a pre-emergent can be used on the entire plot for weed control in that season. Assessments regarding winter hardiness will be conducted after each winter, once the plants begin to show new growth.

Project Results

As this project deals with long term, perennial winter hardiness, full project results will be years away. Initial observations were able in the first season. Funding for this project was not secured in time to take advantage of early orders of rootstock. As a result, most suppliers were sold out of most of their stock and the CLC received varied quality levels of rooted material and varied quality may have an impact on initial dormancy. Material with the most root mass rooted and flushed very well. Other material with minimal root mass struggled. The Henribourg site was prone to deer browse, with replacements required. Wet conditions, along with variable root establishment, delayed fruit budding which is now expected in 2011.

Agronomics of Fall Planted Haskap Conservation Learning Centre

Project Summary

The objective of this project is to document the agronomic elements of fall planting haskap versus spring planting. Early experience shows some benefits of fall planting. This crop is very early to start growing in the spring. Producers have experienced limited growth in the first year with spring planting due to the tendency of this plant to go dormant if not planted early enough as vegetative growth is compromised and the plant goes into a rooting phase. This new berry crop has exploded onto the marketplace with many commercial orchards established and many more in the planning stages. The agronomics of this crop are not completely understood for Saskatchewan conditions and the industry lacks enough information to publish a grower's manual. This project will help the producer better understand the growing aspects of this plant.



Figure 3. CLC Field Day, Haskap Trial.

Project Methodology

Three separate cultivars were hand planted in the fall of 2010 with counterparts planted in the spring of 2011. Spring and fall total numbers will be divided into three separate planting dates one week apart. One hundred and eighty plants of each cultivar will be planted (90 in the fall - 90 in the spring) and these will be replicated in three plots. The U of S will partner with the CLC to conduct measurements.

Project Results

Fall planting in 2010 went well with all cultivars showing typical signs of fall planting including the initiation of rooting. Spring stock is presently in storage, with spring planting to start as soon as conditions allow. Several years of growth will be needed to determine if there are benefits to be accrued for spring versus fall planting.

Investigating Crop Development Opportunities in NC Saskatchewan Conservation Learning Centre

Project Summary

In partnership with the Ministry of Agriculture (MOA), the CLC has the opportunity to utilize its facilities and capabilities to investigate new crop development for north central Saskatchewan and to evaluate performance under local growing conditions. MOA staff will assist in evaluating crop production potential and accessing market information. Interested local producers will be able to observe these potential crops and present ideas to MOA and CLC staff.

Project Methodology

Demonstration strip plots of 16 annual and eight perennial new or novel crops were seeded and planted. The demonstration was done on a small, non-replicated plot basis designed to be utilized as an extension tool for field days, tours and for use with the school program. The plots will be hand-weeded. These demonstration plots are designed to simply provide an opportunity to observe the morphology of new crops and how they grow in the region. More specific details on agronomics are available for most of these crops from various research scientists scattered across western Canada. Pictures and notes will illustrate plot development. Interest in these crops came from different producer groups and industries, including organic, fruit, herbs and spice producers and the biofuel, pet food and health product industries.

Project Results

This demonstration plot proved to be one of the more popular in 2010. The wet conditions did not have the devastating effects that other projects at the CLC experienced. Producers were quite interested and several special mini-tours were held for individuals that became aware of the demonstration. It was also viewed by over 100 participants during CLC field days. The ancient grain varieties sparked the most

interest with some producers stating they would add these grains into their crop rotation. The establishment of the herb plot was very well received, along with a surprising interest from whitetail deer hunters who inquired about forage turnips for food plots and others inquiring about their application as a lure crop to protect other specialty crops from deer damage.

***Demonstration of New Crop Varieties for NE Saskatchewan
Conservation Learning Centre***

Project Summary

This demonstration project will showcase the latest variety releases from the Crop Development Centre (CDC) at the University of Saskatchewan. The demonstration will focus on wheat, oats, red lentils and green and yellow field peas. Producers are always looking for new varieties and like to see field demonstrations before committing large acres to a new variety. Each new variety will be compared to a check variety in the field, giving producers hands-on comparisons of the new to existing varieties. The impact of this project should be quite significant, as our research indicates that producers feel this is the most important type of project to get them onto the farm to witness the results. Positive results would suggest producers would adopt these new varieties for future crops.

Project Methodology

For each crop, the project will compare two new varieties to an established variety used as a check. Yield measurements were derived from one metre random samples taken at crop maturity.

Project Results

Wheat Variety	Yield (bu/acre)	% Increase over check
Wheat CDCStanley (check)	73.31	
AC Fieldstar	76.58	4
AC Unity	90.2	19

Note: This was a small plot trial that was one year old. Samples were taken from a one metre swath in the row and were hand thrashed.

Seeding Trends Fall 2010
Conservation Learning Centre

Project Summary

The intention of this project is to demonstrate the extended window for fall seeding by hosting a field day for producers in October. This day will highlight optimum fall seeding dates, depths and drill seeding equipment for various fall seeded crops. The continuing trend toward increase in farm size has producers looking for alternate ways to maximize equipment use. Fall seeding allows producers to increase acreage without increasing equipment needs, and therefore costs. Fall seeding has many benefits that derive from reduced spring seeding, freeing up valuable time for weed control. Crops seeded in the fall are generally ready for harvest earlier than spring seeded, maximizing harvest machinery use as well as seeding equipment. The advances in seeding equipment technology are particularly responsive to small seed size crops. Most equipment manufactureres offer independent packing options that facilitates small seeds. Camelina is an example of a crop with very small seed size that responds very well to both fall seeding and new seeding equipment advances.

Project Methodology

This demonstration was to take place at the CLC with X equipment dealer participants on approximentaly 60 acres. Due to the "knob and kettle" topography at the farm and various seeding tools demonstrated, plot design will be confirmed once total participants have been established.

Project Results

Due to a demonstrator being sold out of tractors to pull their drill, fair comparisons ould not be achieved. It was agreed to postpone this demonstration to October 2011.

Financial Statement

The following financial statement provides a full accounting of total funds received from the Ministry of Agriculture through the AgriARM and ADOPT programs.

Revenues	Funds (\$)
AgriARM	45,000
ADOPT	36,695
Total	81,695

Expenditures	
Salaries and benefits	
Staff (other than summer students)	30,720
Summer students	3,000
Rental Costs (office and power)	2,229
Materials/Supplies (office, phone, cell phone)	2,520
Travel	771
Other (insurance)	2,504
Audit Fees	3,256
<i>Total AgriARM</i>	<i>45,000</i>
<i>Expenses allotted to ADOPT</i>	<i>36,695</i>

Grand Total	81,695
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Annual Work Plan

To follow, due Feb.28, 2011

Contact Information

Curtis Braaten, Manager
Conservation Learning Centre
Box 3003, 800 Central Avenue
Prince Albert, SK S6V 6G1
T: 306-960-1834 F: 306-764-2844
E: curtis@conservationlearningcentre.com
Web Site: www.conservationlearningcentre.com