GREEN PLAN PROJECTS IN WEST CENTRAL SASKATCHEWAN

D. Haak, PFRA, Rosetown, 882-4272

Over the past 3 years about 100 projects involving almost $900,000 were approved and implemented under the Regional Farm Based Component of Green Plan in west-central Saskatchewan. The projects were conducted by 11 different local groups, 7 of which were ADD Boards. One of the keys to success was the participation of about 250 farmers. This poster features some of the most successful projects. A list of the types of projects is also provided and organized under the headings; ***annual crops, forages, shelterbelts, water quality, and school education.*** Unless indicated, all of these projects were regionally funded.

1. ANNUAL CROP PROJECTS

1. Conservation Demonstration Farms: direct seeding, diverse crop rotations, reduced tillage, and green manure
2. Alternate Crop Demonstrations: dry beans, chickpeas, spices, etc.
3. Manure Application in Direct Seeding Systems
4. Increased Seeding Rates for Moderately Saline Soils
5. Increasing Protein for Cereal Crops on Fallow
6. Yield Mapping and Soil Sampling for Precision Farming
7. KCL Demonstration to Determine Yield Response at Different Slope Positions

Feature #1: "Conservation Tillage and Water Quality on Rolling Landscapes:

(funded through Research Component of Green Plan)

John Bennett, one of Saskatchewan's top zero tillage farmers, has to deal with some of Saskatchewan's most hilly landscapes near Biggar.. Two years ago the National Hydrology Research Institute began a study to determine how tillage system affects moisture movement in these landscapes. They are also looking at displacement of herbicides and nutrients from runoff and leaching processes. What makes the study particularly interesting is that there are 4 farmers with 4 different tillage systems located at the intersection of two roads all within the same watershed. Two are zero tillage farmers and two are conventional tillage. John Bennett's land has been in zero till the longest, about 10 years.

Map ID#	Tillage System	Rotation (% of time)	Inputs	# Years
1	Zero	Continuous	High	10
2	Conventional	Crop/Fallow (50/50)	Low	25
3	Conventional	Crop/Fallow (67/33)	High	7
4	Zero	Continuous	High	4

Below are some preliminary results comparing 2 of the tillage systems.

Tillage System	Zero (10 year)	Conventional (50/50)
Soil Organic Matter (%)	3.2	2.8
Total Soil Nitrogen (mg/ kg soil)	2496	2008
'96 Infiltration Rate (mm/hr)	82.9	68.5
'95 Infiltration Rate (mm/hr)	75.8	51.7
February '96 Snow Depth (mm)	126.5	61.8
Soil Aggregate Stability (%)	61.4	49.5
April '96 Soil Moisture (%)	34.0	32.7

ALLAN CANNON GREEN PLAN **DEMO FARM - KINDERSLEY** * Extra N applied @ 6 leaf stage with coulter disc. ** Provide added. + Canola varieties.

1994 Crop	1995 Crop						1996 Crop					
	Field Size (Acres)	Crop Type	Fertilizer (lbs./ac actual)	Yield (bu/ac)	Protein (%)	Net Return ($ per Acre)	Field Size (Acres)	Crop Type	Fertilzer (lbs./ac actual)	Yield (bu/ac)	Pmtein (%)	Net Return ($ per Acre)
	4.1	Wheat	58-25-O	54.6	11.7	122						
Chemfallow	4.7	Wheat	44-19-O	49.2	11.6	97						
26ac	4.1	Wheat	29-13-O	42.0	10.7	62	26.0	Chemfallow				
	12.0	Wheat	9-20-O	30.4	10.6	-2						
Durum												
26ac	26.0	Chemfallow					67 67 67	Wheat Wheat Wheat	45-33-0 **35-33-0*** 15-33-0	45.3 35.5 35.6	11.0 11.5 11.7	54 40 57
							6.3	Wheat	**55-33-0***	44.3	11.4	60
Barley	12.5	**Lentils**	**16-16-0****	14.2		27	6.3	Wheat	35-33-O	45.2	11.2	76
25ac	12.6	**Chickpeas**	21.210	14.2		-34	6.3	Wheat	36-33-O	42.9	10.8	67
							6.3	Wheat	**65-33-0***	48.9	11.6	67
Canda												
25ac	11.0 7.0 7.0	Wheat Wheat Barley	60-33-0 61-25-0 55-21-0**	30.9 30.5 30.0	13.4 13.9	31 71 91	25	**Lentils**	**13-20-0-10**	35.8		238
	13.0	**Solin**	51-25-O	18.0		-16	8.5	Wheat	5633-O	46.3	9.6	58
Wheat							6.5	Wheat	**75-33-0***	52.0	10.9	78
	8.5	Canda	62-32-O-l 1	16.2		4	6.5	Wheat	66-33-O	50.9	**10.4**	86
26ac	6.5	Canda	**62-32-0-11****	17.3		IO	6.5	Wheat	85336'	**54.5**	**11.4**	**83**
							4.7	**Garrison+**	**53-0-20-10**	**26.2**		**56**
	14.0	**Barley**	**27-27-0**	33.7	-	20	**4.7**	**46A05+**	5820-O-10	29.0		**78**
Peas							4.7	Quantum+	53-20-O-10	31.0		**93**
22ac							2.0	**Garrison+**	**53-20-0-10**	31.9		**100**
	4.0	Wheat	14-33-O	22.8	**14.2**	38	2.0	**46A05+**	**53-20-0-10**	32.1		**102**
	4.0	**Wheat**	**9-20-0****	**21.4**	**13.5**	**29**	**2.0**	**Quantum+**	**53-20-0-10**	34.0		**116**
							2.0	**Mixture+**	**53-20-0-10**	-		-

Feature #2: "Allan Cannon Demonstration Farm"

Allan Cannon, who farms near Kindersley, has been investigating new crop rotations under a direct seeding system for 3 years. Most of the quarter was converted to various stages of a cereal/pulse/cereal/oilseed rotation. Part of the quarter was left in a wheat/fallow rotation as a check.

Al uses a Flexicoil 5000 Air Drill with 12" row spacings and 3.5" rubber gang mounted packer wheels. In 1995 he used a Swede double shoot opener which resulted in 1-2" seed spread and all fertilizer banded to the side. In 1996 he changed to a single shoot Flexicoil boot with 3" spread. Some fertilizer was applied with the seed, with extra N applied separately in liquid form through a coulter disc.

One of the key findings was the importance of adding adequate fertilizer, to maximize net returns. This was especially true for fallow land, where many farmers have traditionallynot added enough N fertilizer. Most of benefit was in extra yield as opposed to improved protein.

2. FORAGE PROJECTS

1. Forage / Annual Crop Economic Comparisons
2. Forage Species Demonstrations
3. Fertilizing Forages for Improved Yield and Quality
4. Harvesting Road Allowances for Silage
5. Pocket Gopher Control
6. Grazing Systems: Rotational, Swath Grazing
7. Forage Seeding on Marginal Land
8. Monitoring Forage Yield and Quality on Saline Land
9. Control of Foxtail Barley in Forage Stands
10. Grassed Waterways for Erosion Control

Feature #3: "RESOURCE MANAGEMENT IN ROLLING TOPOGRAPHY"

Hugh Crawford Site, Allan Hills, 35 km northeast of Davidson

What's the best thing to do with a quarter section of rolling land that is marginal for annual crops, but ideally suited for wildlife and cattle? Convert it to perennial forages, of course. The changes are dramatic when one compares this quarter with surrounding ones. Over a 3 year period depleted soil organic matter levels were restored with sweetcover green manures and zero tillage seeding of a cereals. The land was then ready to be seeded to forages. Cooperation from a number of agencies, a good cooperator, and a detailed plan allowed this project to succeed and act as a model for all the other quarters in the Allan Hills.

	1994	*1995*	*1996*
Plot 1 33 ***acres***	Beaver tap rooted alfalfa. Seeded October 30/93.	Cut for hay. 1 tonlac.	Cut for hay. 1 ton/ac.
Plot 2 28 ***acres***	Pasqua HRS Wheat. 20 bulac. Under seeded to Sweet Clover.	Sweet Clover Desiccated with Round-up, then cultivated.	Pasqua HRS Wheat, 30 bulac. Seed forage mix' in the spring 1997.
Plot 3 27 ***acres***	Oriental Mustard 13 bulac. Under seeded to Sweet Clover.	Sweet Clover Desiccated with Round-up, then cultivated.	Kyle Durum. 32 bulac. Seed forage mix* in the spring 1997.
Plot 4 33 ***acres***	Pasqua HRS Wheat 25 bu/ac.	Seeded fonge Mix* May 8.	Cut for hay. 1 tonlac.
Plot 5 25 ***acres***	Sweet Clover green manure chemfailow June.	Barley 38 bu/ac.	Pasqua HRS Wheat. 17 bulac. Seed forage mix' In the spring 1997.
Plot 6 6 **acres**	Malt Barley 37.5 bulac.	Seeded forage mix* May 8.	Cut for hay. 1 tonlac.
Plot 7 11 ***acres***	Sweet Clover green manure chemfaiiow June.	Oats 59 bu/ac.	Stein Barley 40 bu/ac. Seed forage mix* in the spring 1997.

• Forage mix includes Intermediate Wheatgrass, Meadow Bromegrass and Alfalfa.

3. SHELTERBELT PROJECTS

1. Video Production on Establishing Shelterbelts
2. Creating a Shelterbelt Microclimate on Rolling Land
3. Plastic and Straw Mulches for Shelterbelt Weed Control
4. Block Plantings of Multi-Use Shelterbelts
5. Shelterbelts for Wildlife Habitat
6. tnvestigating Harvest of Mature Caraganas for Various Markets
7. Tree Establishment on Saline Soils

Feature #4: "Forest Shelterbelt - Archie & Beth Robertson, Zealandia"

This project, implemented through PFRA's Shelterbelt Centre, demonstrates a large variety of tree and shrub species, for various potential uses, including wood, fruit, and wildlife habitat. Included in this demonstration are plastic and fibre mulch for weed control, and a mixture of wheatgrasses for inter-row weed control and wildlife habitat.

Row Number	Species
1	Mixed Caragana and Green Ash
2	White Spruce
3	Green Ash Hackberry
4	Green Ash Poplar Russian Olive
5	1 2 3 4 5 6 7
6	1 2 3 4 5 6 7 8 9 10 11 12 13 14
7	1 2 3 4 5 6 7 8
8	1 2 3 4 5 6 7 8 9 10 11

Row *5*

1. Choke Cherry
2. Buffaloberry
3. Sea-Buckthom
4. Siberian Crabapple
5. Ussurian Pear
6. Hawthorn
7. Sea-Buckthom

Row *6*

1. Choke Cherry
2. Goiden Currant
3. Dakota Gooseberry
4. Sand Cherry
5. Missouri Currant
6. Buffalobetry
7. Wild Plum
8. Highbush Cranberry
9. Saskatoon
10. Pin Cherry
11. Hedge Rose
12. Sour Cherry
13. Sea-Buckthom
14. Choke Cherry

Row *7*

1. Mongolian Cherry
2. Buffalobetry
3. Saskatoon
4. Siberian/Mongolian Crabapple
5. Convoy Plum
6. Mongolian Cherry
7. **Pin Cherry**
8. Choke Cherry

Row *8*

1. **Nanking** Cherry
2. Black Currant
3. Siberian Crabapple
4. Hedge Rose
5. Buffalo Berry
6. Golden Currant
7. American Plum
8. Dwarf American Cranberry
9. Hedge Rose
10. Siberian Crabapple
11. Pin Cherry

4. WATER QUALITY PROJECTS

1. Solar Pumps and Fenced Dugouts for Improved Livestock Water
2. Coagulation Cells for Improved Dugout Water Quality
3. In-House Biological Treatment Systems for Improved Surface and Ground Water Quality
4. Removing Soft Sediments from Dugouts
5. Water Hyacinth Plants for Improved Dugout Water Quality
6. Investigating the Effect of Farming Practices on Surface Water Quality
7. Monitoring Shallow Wells for Pesticide and Nitrate Contamination

Feature #5: 'Coagulation Cells For Improved Surface Water Quality

Coagulation chemicals such as aluminum sulfate and ferric chloride have been shown to effectively remove organic materials from dugout water, making it suitable for household use. However, treating an entire dugout is inefficient and costly, especially if not all of the treated water is used in one year.

This problem was addressed by constructing a smaller, 300,000 litre cell beside a dugout. Water was pumped from the dugout to the cell, and then treated with coagulation chemicals. These chemicals combine with organic materials in the water to form a sludge which settles to the bottom of the cell. The cell was equipped with a liner to allow for efficient removal of sludge and a surface cover to help maintain water quality after treatment. This size of cell provides about a six month supply of water for an average household.

Green Plan funding allowed for the construction and testing of six sites in Saskatchewan in 1996. Two of these were in the West Central Region, near Craik and Laird. These projects involve a number of agencies including SRC, Sask. Water, PFRA, and various ADD Boards.

5. *SCHOOL EDUCATION PROJECTS*

1. Ducks Unlimited Field Trips on the Common Goals of Sustainable Agriculture and Wildlife Habitat
2. Urban / Rural Student Exchanges: Touring Farms and Food Processing Facilities
3. Implementing the "Living Soil" Science and Social Studies Resources in Schools
4. Sustainable Agriculture Workshops: Farmers Sharing their Experiences with Students
5. Developing Water Quality and Watershed Study Resources for Schools visiting the Beaver Creek (south of Saskatoon).

Feature #6: Midlakes Waste Management Program, Kenaston, SK

The Kenaston Community Environmental Association has operated a small recycling centre in the Village of Kenaston since 1992. Since that time there has been growing interest from surrounding villages and rural municipalities to join Kenaston in a regional waste management program. This expansion became a reality in April 1996, due to funding provided by Green Plan and Environment Canada's "Action 21" program. This project is somewhat unique, because most other waste management projects in Saskatchewan involve cities or towns.

The regional depot at Kenaston accepts paper, cardboard, tin, glass, and plastic. These materials come from surrounding communities that have their own collection program and from individual drop offs.. Recyclable materials are compressed into 1000 lbs bales. When sufficient numbers of bales have accumulated they are shipped to a market. The Kenaston group has partnered with the Town of Outlook's Recycling Centre, in combining their bales to allow for quicker marketing.

A composting program is also being initiated. Together with the recycling activities, the group believes landfill material can be reduced by 70%. They also hope that the sale of recyclable materials will ensure the project's longterm viability. The West Central Regional Committee recognizes that the key to success has been the commitment and work of many volunteers and local govermnents. The Green Plan funding just enabled the group to take the next step in their development.