Conservation LEARNING CENTRE

Field Notes 1995

CANADA'S GREEN PLAN

Ducks Unlimited Canada

SASKATCHEWAN SOIL CONSERVATION ASSOCIATION

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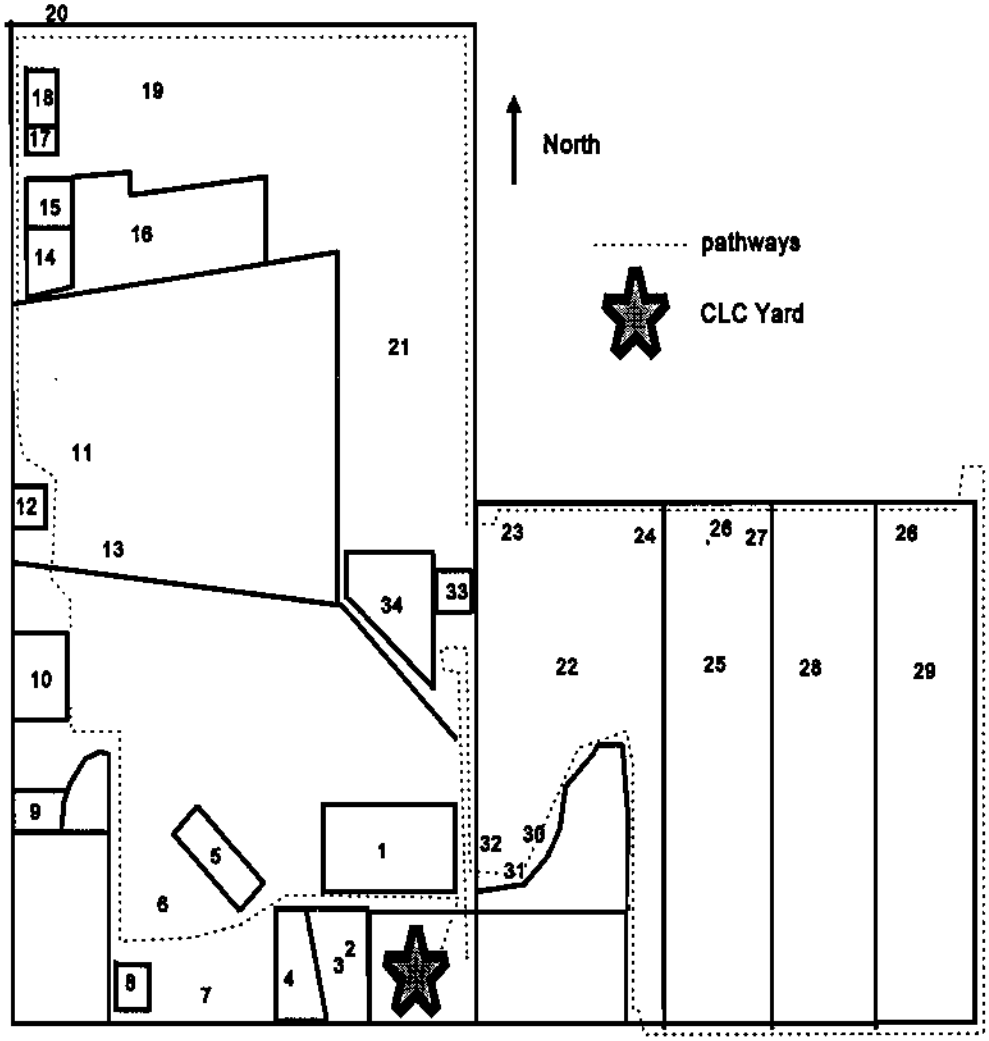
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Conservation Learning Centre

Project List 1995

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3. Tree Establishment and Vegetation Control Trial
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Introduction

In the spring of 1993, the Conservation Learning Centre was established south of Prince Albert, Saskatchewan. It is a demonstration farm which focuses on farming practices which conserve soil, water and wildlife in the Parkland region.

The site consists of 3 quarter sections of land, used for a variety of purposes. These purposes include demonstrations, research, and student activities relating to three primary areas of interest which are direct seeding, forages, and shelterbelts.

The Conservation Learning Centre (CLC) is meant to be a learning place, for all ages and all levels of expertise. For example, researchers are invited to establish applied research plots or benchmark testing at the Centre. Producers are given the opportunity to learn about the research and demonstration results through summer tours, winter workshops, and the media. Youth are also invited, with their teachers, to visit the Centre for tours and learning activities which are designed to teach about conservation strategies.

B. Acknowledgements

A partnership of producers, government and non-government organizations, and industry has made this project possible. Throughout this report, sponsorship is acknowledged for support of specific projects. The CLC is grateful for the support of its three founding partners, Canada's Green Plan through Agriculture and Agri-Food Canada, Ducks Unlimited Canada, and the Saskatchewan Soil Conservation Association. Also, thanks to the many hours of work that the steering committee members have invested in the project:

C. Projects

The Conservation Learning Centre provides public tours, customized group tours, and self-guided tours. This booklet is meant to be used to help you in your self-guided tour. The projects are listed in the order you would find them if you were to start the tour at the yard site and proceed according to the suggested route below. However, if you start your tour elsewhere, just find the project number closest to you and proceed in a clockwise direction, following the paths.

1. CROP ROTATION BY NITROGEN PLACEMENT

Purpose: To evaluate several different fertilizer N application options associated with direct seeding of wheat, barley, canola and flax.

Treatments: This is the second year of a 4 year project. N fertilizer is applied at soil test recommended rates using 4 different application methods:

* pre-seeding banding of N, followed by direct seeding (two pass system)
* side banding at seeding (one pass system)
* post-seeding spoke injection (two pass system)
* conventional seeding system using pre-seeding tillage

Crop: Area split to include a crop rotation of barley - flax - wheat - canola, having all four crops at the site in every year.

Sponsorship: This is a project of the Melfort Research Station, under the supervision of Dr. Adrian Johnston.

2. WOODLOT

Purpose: To demonstrate a small woodlot that is planted for potential future cash value, wildlife habitat, aesthetic value, and yard shelter.

Species: Poplar, birch, Siberian larch, Jack pine, Scots pine, white spruce, various fruit-bearing shrubs

Sponsorship: This is a joint project of the PFRA and the Canadian Forest Service

3. TREE ESTABLISHMENT AND VEGETATION CONTROL TRIAL

Purpose: To evaluate several methods of controlling weeds within newly planted trees.

Treatments: Trees planted in June, 1994 and May, 1995.
Weeds controlled through the use of:
herbicides only
tillage only
perforated plastic blankets
Jack pine wood shavings mulch
no weed control

Sponsorship: This is a joint project of the PFRA and the Canadian Forest Service.

4. NITRO ALFALFA

Purpose: To evaluate the success and use of a non-dormant alfalfa, named Nitro Alfalfa, in a Saskatchewan Parkland location.

Planting method: * June 21,1994 - broadcasted alfalfa into a three acre block of cereal stubble previously sprayed with Roundup. Randomly harrow packed, additional packing with pea roller.

Measurements taken: Productivity and winter survival are the primary interests. Seed production will be attempted in 1995.

Sponsorship: Ducks Unlimited Canada
Saskatchewan Agriculture and Food

5. VARIABLE RATE N FERTILIZATION TRIAL

Purpose: To assess variable versus uniform N fertilizer application rates for cereal and oilseed crop production under conservation tillage.

Treatments: This is the second year of a 3 year project. N fertilizer rates are applied according to:

* uniform application
* different soil residual nitrate-N levels delineated by soil grid sampling to a 30 cm. depth
* different soil organic matter contents delineated by soil grid sampling to a 15 cm. depth
* different landform element complexes (topography)

Crop: Wheat

Previous Crop: Norlin Flax

Fertilizer: Fertilizer applied according to treatments.

Sponsorship: This is a project of the Melfort Research Station, under the supervision of Dr. Hugh Beckie.

6. FIELD-SCALE: CPS BIGGAR WHEAT

Purpose: To produce a wheat crop using direct-seeding techniques.

Crop: CPS Biggar Wheat seeded with Flexi-coil Airseeder equipped with knives, gang-mounted packers, at 1 and 2.5 bu./ac., May 27-29. Seed treated with Vitavax single solution.

Previous Crop: Express Yellow Peas

Fertilizer: Seedplaced 100# (20-30-0), Flexi-coil knife
Spoke Wheel applied 50 # actual N, June 23

Pesticides: Mix of 0.75 L./ac. Roundup and 2 oz. Banvel applied May 23
Refine Extra (8 oz./ac.) and Assert (0.53 L./ac.) applied June 23

Sponsorship:
Roundup supplied by Monsanto
Banvel supplied by Sandoz
Seeder supplied by Flexi-coil
Refine Extra supplied by DuPont
Granular fertilizer supplied by Cominco
Liquid Fertilizer supplied by Simplot
Assert supplied by Cyanamid
Vitavax supplied by Gustafson
Spoke Wheel Applicator supplied by Pattison Bros.

7. Copper

Purpose: Soil tests taken in the fall of 1994 showed a deficiency of copper in soils at the CLC. A 7 acre area of Biggar Wheat has received a foliar application of copper to help us decide whether a copper application would be economically favourable.

Treatments: 1) Copper applied at a rate of 0.1 #/ac.
2) Copper applied at a rate of 0.2 #/ac.
3) no Copper applied.

Crop: CPS Biggar Wheat treated the same way as the rest of the Field Scale Biggar Wheat, as described above.

Sponsorship: Copper, soil and plant tissue tests supplied by Esso Farm-Tek.

8. SHELTERBELT SPECIES GARDEN

Purpose: To demonstrate the shelterbelt species which are recommended for yard, field, wildlife shelterbelts, and forest belts.

Species: Planted in June, 1994 and May, 1995; plastic mulch applied in May, 1995:

- elder, hedge rose, dogwood, buffaloberry, sea buckthorn, villosa lilac, chokecherry, pincherry, saskatoon, Siberian Larch, white spruce, red pine, Scots Pine, Colorado Spruce, Jack pine, Manitoba maple, green ash, paper birch, acute willow, silver leaf willow, Russian olive, Walker poplar, Assiniboine Poplar, Aspen Poplar.

Sponsorship: This is a project of the PFRA.

9. EFFECTS OF ALFALFA WITHIN THE CROP ROTATION

Purpose: To evaluate the influence of alfalfa stand length on subsequent crop production in a conservation tillage production system.

Treatments: This is the second year of a 9 year project. Alfalfa will be seeded in 1994, 1995, 1996, and 1997. In 1998, all alfalfa will be terminated by different methods and seeded to annual crops.

Measurements: Soil, crop and weed characteristics will be monitored.

Sponsorship: This is a project of the Melfort Research Station, under the supervision of Dr. Adrian Johnston and Ms. Heather Loeppky.

10. FORAGE SEEDING METHODS STUDY

Purpose: To determine the influence of eliminating tillage in seedbed preparation on establishment, weed populations, forage and seed production and economics of alfalfa and meadow bromegrass production.

Treatments: This is the second year of the project. Alfalfa and meadow bromegrass were seeded on June 21, 1994. Half was seeded into pre-tilled conditions, while the other half was seeded into standing wheat stubble, pre-treated with Roundup.

Sponsorship: This is a project of the Melfort Research Station, under the supervision of Dr. Heather Loeppky.

11. DENSE NESTING COVER

Purpose: To demonstrate the successful establishment of a forage stand intended for use as dense nesting cover (45 acres).

Species seeded on June 1, 1993:

* 37% Intermediate Wheatgrass
* 37% Tall Wheatgrass
* 10.5% Slender Wheatgrass
* 10.5% Meadow Bromegrass
* 5% Alfalfa

Treatments: The forages were cut and baled in 1994. In June, 1995, due to Canada Thistle infestation, the stand was sprayed with 2/3's of the regular rate of Lontrel. This will help control the Canada Thistle and also thin the alfalfa.

Sponsorship: This is a project of Ducks Unlimited Canada.

12. POTENTIAL FORAGES FOR USE AS DENSE NESTING COVER

Purpose: To evaluate the persistence of several forages within dense nesting cover.

Species: Over-seeded through traditional dense nesting cover mixture on June 1, 1993:

* S-7133K Smooth Bromegrass
* Greenleaf Pubescent Wheatgrass
* S-9051 Intermediate Wheatgrass
* James Dahurian Wild Ryegrass
* Lodorm Green Needlegrass
* Common Sheeps Fescue
* S-1755 Hard Fescue
* Oxley Cicer Milkvetch
* Yellowhead Alfalfa
* Anik Alfalfa

Sponsorship: This is a project of the Melfort Research Station and Ducks Unlimited Canada, under the supervision of Dr. Scott Wright.

13. WALKING TRAIL

Purpose: To demonstrate land use choices and agricultural practices which benefit wildlife habitat. To raise awareness of habitat used by several forms of wildlife.

Method: A walking trail is in the process of being developed for use by the public, accessed through a newly developed parking lot on CLC land next to a well-used highway. Although signage is not yet developed, you are welcome to enjoy using the mowed walkway.

Sponsorship: Students and staff of the Integrated Resource Management course of the Sask. Institute of Applied Arts and Sciences, Prince Albert.
Ducks Unlimited Canada

14. FORAGE GRASS VARIETY GARDEN

Purpose: To demonstrate 35 grass varieties and species which are of interest to farmers in the Parkland area.

Varieties seeded June 1,1994:

* Reed Canarygrasses: Rival, Palaton, Venture, Vantage

* Russian Wildryes: Cabree, Mayak, Swift, Tetracan, Eejay, Pearl, Prairieland

* Wheatgrasses: Elbee Northern, Walsh Western, Sodar Streambank, Orbit Tall, Greenleaf Pubescent, Clarke Intermediate, Chief Intermediate, Summit Crested, Nordan Crested, Parkway Crested, Fairway Crested, Kirk Crested

* Bromegrasses: Rebound Smooth, Baylor Smooth, Regar Meadow, Magna Smooth, Paddock Meadow, Carlton Smooth, Fleet Meadow, Signal Smooth

* Lodorm Green Needlegrass

* Short Lived Grasses: Arthur Dahurian Wildrye, James Dahurian Wildrye, Adanac Slender Wheatgrass, Revenue Slender Wheatgrass

Fertilizer: 50 # actual N /acre as liquid, spoke wheel injected, June 9, 1994.

Sponsorship: Seed and seeding provided by the Sask. Forage Council

15. PERENNIAL LEGUMES GARDEN

Purpose: To demonstrate 24 different perennial legume varieties and species which are of interest to farmers in the Parkland area.

Varieties seeded May 29, 1995:

* Alfalfas: Heinrichs, Rangelander, Beaver, Algonquin, Vernal, Anchor, OAC Minto, Apica, Alouette, Dekalb 120, Barrier, Pioneer 526, Profit, Anik, AC Nordica, Oneida VR

* Red Clovers: Altaswede, Florex

* Alsike Clovers: Aurora, Dawn

* White Clover: Sonja

* Sainfoin: Nova

* Birdsfoot Trefoil: Leo, Cree

Fertilizer: Inoculated with appropriate rhizobium for each species.

Sponsorship: Seed and seeding provided by the Sask. Forage Council

16. GRASS SEED PRODUCTION DEMONSTRATION

Purpose: To demonstrate grass seed production.

Treatments: 6 different grasses were seeded with and without a companion crop of barley (seeded at rate of 40#/ac). The grasses were cross seeded with the barley on June 6,1995:

* Paddock Meadow Bromegrass (@ 4 #/ac.)
* Kirk Crested Wheatgrass (@ 3 #/ac.)
* Revenue Slender Wheatgrass (@ 3 #/ac.)
* Arthur Dahurian Wild Ryegrass (@ 3.5 #/ac.)
* Courtney Tall Fescue (@ 3.5 #/ac.)
* Italian Wild Ryegrass (@ 3.5 #/ac.)

Sponsorship: Seeding and monitoring supplied by Ducks Unlimited Canada
Seed supplied by Newfield Seeds

17. HERBICIDE TOLERANT CANOLAS

Purpose: To demonstrate herbicide tolerant canolas as alternative canolas to use in a diversified cropping and weed management system.

Crops and matching herbicides: Roundup Ready Canola and 0.5 L/ac.Roundup
Innovator Canola and Liberty Herbicide

Sponsorship: Roundup Ready Canola and Roundup supplied by Monsanto
Innovator Canola and Liberty supplied by AgrEvo

18. ALTERNATIVE ANNUAL CROPS GARDEN

Purpose: To demonstrate 22 different crops which are of interest to farmers in the Parkland area, who wish to diversify their crop rotations.

Crops seeded May 7:

* Carneval Pea - early maturing, semi-leafless, medium vine length, moderate to high yields, good lodging resistance.
* Grande Pea - medium maturity, long vine length, high yields, moderate to large seed size.
* Bohatyr Pea - large and smooth seed, medium maturity and vine length.
* Highlight Pea - medium size, early maturity, short vines, semi-leafless, resistant to powdery mildew.
* Express Pea - large seed, medium maturity, short vines, standard yellow pea.
* Radley Pea - medium size green pea, semi-leafless, medium maturity, short vines, subject to bleaching.
* Laird Lentil - large seed, taller variety, late maturing, some disease resistance.
* Richlea Lentil - medium sized seed, medium maturity, good yielding, improved cooking qualities.
* Eston Lentil - small seed, shorter variety, early maturing, susceptible to ascochyta blight.
* Rose Lentil - medium size red lentil, medium maturity, grown for red split lentil market.
* French Green Lentil - blue/black seed coat, high yielding, grown for French market.
* Lathyrus - grass pea, large irregular seed, used for human food or livestock feed, nutrition concern due to toxin that may result in paralysis, but breeding program can reduce levels.
* Sunola - short sunflower, maturity similar to wheat, oil content higher than canola.
* Triticale - cereal grain, cross of wheat and rye, used for livestock feed, silage or flour.
* Canaryseed - grown for bird feed, managed similarly to wheat.

* Coriander - spice crop, main ingredient of curry powder, slow to germinate, maturity @ 100 days.
* Fenugreek - legume spice crop, pickling spice, oil extracted for maple flavour.
* Quinoa - high protein grain used in the health food market, related to the weed - lamb's quarters, 100+ days to maturity.
* Cumin - annual spice used in chili powder, prefers cool growing conditions, 50 days to flower.
* Savory - annual spice, grown for foliage or oil, used in meat products, fresh or dried.
* Borage - annual oilseed, grown for health food market, maturity 90+ days, shattering problem at harvest.
* Linola - food quality flax oil, late maturity, good lodging resistance.
* Fibre Flax - developed for the fibre industry for uses such as paper, cloth.

Fertilizer: No fertilizer applied

Pesticides: No pesticides used, hand weeded.

Sponsorship: Prince Albert Agriculture, Development and Diversification Board

19. FIELD-SCALE NORLIN FLAX

Purpose: To produce a flax crop using direct seeding techniques (30 acres).

Crop: Norlin Flax seeded at 0.75 bu./ac. with a Flexi-coil airseeder, equipped with gang-mounted packers, May 30.

Previous Crop: Harrington Barley.

Fertilizer: Seedplaced 50# (12-51-0)
Spokewheel injected 70# actual N/acre, liquid on June 24

Pesticides: Roundup applied at 1 L/acre on May 24
'FlaxMax' mix of Poast (0.45 L/ac.), Lontrel (100 g AI./ac), and MCPA Ester (445 ml./ac.) applied on June 23
Seed treated with Vitavax Single Solution

Sponsorship: Granular fertilizer supplied by Cominco
Roundup supplied by Monsanto
Seeder supplied by Flexi-coil
Vitavax supplied by Gustafson
Liquid N supplied by Simplot
Spoke wheel equipment supplied by Pattison Bros.

20. WHITE SPRUCE FIELD SHELTERBELT

Purpose: To demonstrate the establishment of an evergreen shelterbelt.

Site: A road allowance has been allowed to grow a stand of aspen poplars on the north side of the field property. This provides significant protection to the fields adjacent to it. It also provides an ideal area for white spruce to grow well in. The spruce will add aesthetic value to the area as well as diversifying the habitat.

Sponsorship: This is a project of the PFRA.

21. FIELD-SCALE NORLIN FLAX

Purpose: To produce a flax crop using direct seeding techniques (55 acres).

Crop: Norlin Flax seeded at 0.75 bu./ac. with a Flexi-coil airseeder, equipped with gang-mounted packers, May 30.

Previous Crop: Harrington Barley.

Fertilizer: Seedplaced 50# (12-51-0)
Spokewheel injected 75# actual N/acre, liquid on June 24

Pesticides: Roundup applied at 1 L/acre on May 23
Mix of Buctril M (0.40 L/ac.) and Fusion (rec. rate for flax) applied on June 23
Seed treated with Vitavax Single Solution

Sponsorship: Liquid N supplied by Simplot
Fusion supplied by AgrEvo
Roundup supplied by Monsanto
Seeder supplied by Flexi-coil
Vitavax supplied by Gustafson
Spoke wheel equipment supplied by Pattison Bros.
Granular fertilizer supplied by Cominco

22. FIELD-SCALE HIGHLIGHT YELLOW PEAS

Purpose: To produce a pea crop using direct seeding techniques (38 acres).

Crop: Highlight Peas seeded at 2.25 bu./ac. with a Flexi-coil 5000 air drill, Flexi-coil paired row openers at 1 foot shank spacing, June 2.

Previous Crop: Makwa Wheat

Fertilizer: Sidebanded 55# (20-30-0)
Inoculated with Enfix-P liquid (rhizobium inoculant) and Provide (phosphorus inoculant)

Pesticides: Roundup applied at 1 L/acre, May 24
Edge-granules (25#/ac.) applied October 3, 1994, not incorporated
MCPA Na-salts (0.5 L./ac.) applied on June 23
Spot sprayed with Poast on north half for wild oats, sprayed Poast on entire south half on July 1

Sponsorship: Seed supported by Newfield Seeds
Seeder supplied by Flexi-coil
Granular fertilizer supplied by Cominco
Edge and Provide supplied by DowElanco
Roundup supplied by Monsanto

23. GREEN ASH FIELD SHELTERBELT

Purpose: To demonstrate the establishment of a deciduous tree shelterbelt.

Site: Green ash have been planted adjacent to a property line of the farm. They will provide a border as well as providing some shelter to the fields nearby.

Sponsorship: This is a project of the PFRA.

24. DISC VS. PAIRED ROW OPENER

Purpose: To compare crop establishment and growth of 2 distinctly different types of seed openers.

Crops: The John Deere Zero-Till Disc Drill and the Flexicoil 5000 Air Drill with paired row openers were used to seed side-by-side strips of peas and barley. The disc drill was used on May 27 and the Air Drill used on June 2.

Fertilizer: The same amount of fertilizer was seedplaced with both drills.
Enfix inoculant was used with both seeders when seeding the peas, Provide was not applied with the disc drill.

Sponsorship: Drills supplied and operated by Ducks Unlimited Canada and Flexi-coil.

25. FIELD-SCALE: B1215 Barley

Purpose: To produce a barley crop (32 acres) with direct-seeding techniques.

Crop: B1215 Barley seeded with a Flexi-coil Air Drill, paired row openers, June 2.

Previous Crop: Express peas on the north half, CDC Richard Barley on the south half.

Fertilizer: Sidebanded 70# (20-30-0)
Spoke wheel injected 50 # N liquid on June 22

Pesticides: Roundup applied at 0.5 L/acre, May 24
Seed pre-treated with Vitavax
Sprayed with Target (0.6 L./ac) on June 23

Sponsorship: B1215 Barley and seed treatment supplied by Saskatchewan Wheat Pool
Liquid fertilizer supplied by Simplot
Granular fertilizer supplied by Cominco
Target supplied by CIBA
Seeder supplied by Flexi-coil
Spokewheel injector supplied by Pattison Brothers
Roundup supplied by Monsanto

26. NON-INCORPORATED AVADEX

Purpose: To test 3 new formulations of Avadex in a non-incorporated, medium disturbance direct seeding situation.

Crops: These are tested on both the field-scale B1215 Barley and the Teal Wheat.

Treatments: As applied on May 20th:
* 3 new formulations of Avadex, identified as MON 7986, MON 7902, and MON 7901
* Avadex BW
* check strip with no Avadex applied

Sponsorship: Product and application supplied by Monsanto.

27. SOIL TEMPERATURE PROJECT

Purpose: Crop germination and growth is affected by soil temperature. The purpose of this test is to assess the differences in soil temperatures in several different situations, including differences in residue loads and levels of soil disturbance.

Treatments: Disc vs. knife opener, disc vs. paired row opener
In-furrow vs. between furrow temperatures.
Burned vs. not burned barley straw residues
(Disc-seeded on May 27, knife-seeded on May 30, paired-row seeded on June 2)

Crops: Barley stubble seeded to flax, pea stubble seeded to barley.

Fertilizer: Same fertilizer rates of N and P2O5 within each crop.

Sponsorship: Disc Drill supplied and operated by Ducks Unlimited Canada
Air Seeder (knife) and Drill (paired row) supplied and operated by Flexi-coil
Monitoring equipment supplied by Melfort Research Station and the U. of S.

28. FIELD-SCALE NORLIN FLAX

Purpose: To produce a flax crop using direct seeding techniques (32 acres).

Crop: Norlin Flax seeded at 0.75 bu./ac. with a Flexi-coil airseeder, equipped with gang-mounted packers, May 30.

Previous Crop: CDC Richard Barley.

Fertilizer: Seedplaced 50# (12-51-0)
Spokewheel injected 70 # actual N/acre, liquid, in 2 perpendicular applications on June 23

Pesticides: Roundup applied at 0.5 L/acre on May 24
Mix of Buctril M (0.40 L/ac.) and Fusion (rec. rate for flax) on June 23
Seed treated with Vitavax Single Solution

Sponsorship: Liquid N supplied by Simplot
Fusion supplied by AgrEvo
Roundup supplied by Monsanto
Seeder supplied by Flexi-coil
Spoke wheel equipment supplied by Pattison Bros.
Granular fertilizer supplied by Cominco
Vitavax supplied by Gustafsons

29. FIELD-SCALE: CDC TEAL WHEAT

Purpose: To produce a wheat crop using direct seeding techniques(32 acres).

Crop: CDC Teal Wheat seeded at 1.25 bu./acre, June 2.

Previous Crop: Parkland Canola (65 % hail damage)

Fertilizer: Sidebanded 70 # (20-30-0)
Spokewheel injected 60 # N, liquid, June 22

Pesticides: Avadex formulations applied with no incorporation on May 20
Mix of Roundup(.75 L./ac) and Banvel (2 oz./ac.) applied May 23
Sprayed with Target (0.6 L./ac) on June 23

Sponsorship: Teal wheat supplied by Fenton Seeds
Roundup and Avadex supplied by Monsanto
Seeding by Flexi-coil
Granular fertilizer supplied by Cominco
Liquid fertilizer supplied by Simplot
Spokewheel injector supplied by Pattison Brothers
Target supplied by CIBA
Banvel supplied by Sandoz

30. GREENHOUSE GAS STUDY

Purpose: To measure nitrous oxide gas emissions from the soil.

Background: The loss of nitrogen from the soil to the atmosphere in the form of nitrous oxide is important both agronomically and environmentally. Nitrous oxide represents the unrecoverable loss of nitrogen from the soil-plant system. It has also been implicated as one of the gases involved in global warming and the destruction of the atmospheric ozone layer. Although nitrous oxide emission has been well characterized in the laboratory, considerable uncertainty exists regarding its significance in many ecosystems and regarding the factors regulating it in actual field conditions.

Measurements taken: This is the third year of a three year study of emissions from natural and agricultural soils. The effect of soil texture, topography, land use and precipitation are all included as factors in the study.

Sponsorship: This is a project of the University of Saskatchewan, Soil Science Department, as a post-graduate study by Ms. Marife Corre, under the supervision of Dr. Chris van Kessel and Dr. Dan Pennock.

31. WATER QUALITY STUDY

Purpose: To assess the impact of runoff from agricultural lands on the quality of small potholes. The study started in the Fall of 1994 and will continue until 1997.

Sponsorship: This is a project funded by the federal government through the Green Plan and is a collaborative effort of Agriculture and Agri-Food Canada, the National Hydrology Institute and the University of Saskatchewan (Saskatchewan Centre for Soil Research).

32. FOREST BELT

Purpose: To demonstrate the establishment of a forest belt.

Site: In the distant past, a field shelterbelt was planted on a quarter section survey line on the farm. These trees and shrubs provide some protection to the bordering fields as well as shelter and food for wildlife. Parts of the shelterbelt are starting to die out and some of the bordering land has been left to grow grass. New trees and shrubs have been planted in these grassed areas. The forest belt and other new additions will extend the benefits of the old shelterbelt as well as adding potential future cash value.

Sponsorship: This is a project of the PFRA.

33. CLEAVERS AND DANDELION CONTROL WITH PRE-SEEDING BURNOFF

Purpose: To evaluate the efficacy of several herbicides used as pre-seeding weed control, with special emphasis on the control of over-wintered cleavers and dandelion.

Treatments: Roundup @ 0.5 L./ac. with Agral 90
Roundup @ 1 L./ac.
Roundup (0.13 L./ac.) and Rustler (1.0 L./ac.)
Roundup (0.5 L./ac.) and 2,4-D Amine (0.4 L./ac.)
Roundup (0.5 L./ac.) and Refine Extra (8 g./ac.)
Check

Buctril M and Fusion applied as in-crop spray, June 23

Timing: Applied on May 25, 11:00 A.M., 9°C., approx. 2-3 hours before a shower.
Cleavers - 6-8 whorls with excellent growth.
Sprayed with 10 gal. nozzles, soft water.

Sponsorship: Herbicide applications and assessments done by Roy Button, Sask. Ag. and Food.

34. PLACEMENT AND USE EFFICIENCY OF ANHYDROUS AMMONIA FERTILIZER

Purpose: To assess the efficiency and crop safety of anhydrous ammonia, when applied at the time of seeding, using 2 designs of seed openers.

Treatments:
Paired Row Opener, urea @ 70 kg./ha.
Paired Row Opener, ammonium nitrate @ 70 kg./ha.
Paired Row Opener, anhydrous ammonia @ 70 kg./ha.
Paired Row Opener, no N
Paired Row Opener, anhydrous ammonia @ 35 kg./ha.
Paired Row Opener, anhydrous ammonia @ 105 kg./ha.
Sweep and Froc Boot, anhydrous ammonia @ 35 kg./ha.
Sweep and Froc Boot, anhydrous ammonia @ 70 kg./ha.
Sweep and Froc Boot, anhydrous ammonia @ 105 kg./ha.

Crop: Harrington Barley

Sponsorship: This is a joint project of the University of Sask. (Dr. Alejandro Matus, under the supervision of Dr. Chris van Kessel) and Sask. Wheat Pool R. & D. (represented by Mr. Garry Hnatowich), with funding from the Agriculture Development Fund.