Prairie Steward

Farming For Your Future Environment

The Newsletter of the Saskatchewan Soil Conservation Association Inc. Spring Issue No. 47, 2006

SSCA Environmental Champions

In mid February, SSCA learned that it had been nominated and selected as one of 100 of Saskatchewan's Environmental Champions. SSCA was selected as a Champion for the significant contribution it has made to the province in agriculture, ecology and education.

Due in significant part to the efforts of the SSCA, cropping practices such as summer fallow and frequent cultivation are now changing. In 1990, the SSCA secured funding from the provincial government to launch its technology transfer program to promote soil conservation practices to farmers across the province. The most notable accomplishment over the past decade has been the SSCA's success in helping Saskatchewan farmers adopt low disturbance direct seeding (no-till) systems.

According to the 2001 Census of Agriculture, Saskatchewan has the highest adoption rate of low disturbance direct seeding in Canada, with 39% of the seeded area in 2001. This high level of adoption has been achieved through such activities as field demonstrations and tours, producer meetings, equipment field days, one-on-one consultations, and publishing a newsletter (Prairie Steward) three times a year.

The SSCA also developed Project SOILS, which is an activity-based soil conservation education program for youth. To date, over 1500 educators have been trained to use Project SOILS activities. Project SOILS is a joint project with the Agriculture in the Classroom (Sask.) program.

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In This Issue

SSCA Announces Staff Layoffs

The Saskatchewan Soil Conservation Association's (SSCA) current program funding through Saskatchewan Agriculture and Food and the National Greenhouse Gas Mitigation Program for Canadian Agriculture comes to an end on March 31, 2006. Since no new program funding has been secured, the SSCA Board of Directors announced February 15 that effective March 31, 2006 all Field Staff will be relieved of their duties.

Discussions on project funding renewal were begun both provincially and federally in mid-2005 with formal funding proposals submitted to both levels of government last fall. **The SSCA proposals were not declined, but at the same time were not accepted**. Having received no commitments, the SSCA has had to move forward with its budget planning and be fair and responsible to its long serving staff.

Five highly qualified professional agrologists, with a combined experience totaling over 50 years, are affected by the announcement.

For more than 15 years, the Field Staff of the SSCA have very successfully conducted a technology transfer program that encouraged the adoption of direct seeding / zero tillage systems by farmers from across the province. **Through summer field demonstrations, tours and winter meetings, the staff relayed the latest research and**

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Executive Manager's Report

By Blair McClinton, PAg
SSCA Executive Manager

In my last article, I discussed SSCA's current funding situation and that we may be forced to layoff our field staff and shut down our field programs. I could use this space to vent my frustration about our funding situation. However, as nothing has changed since I wrote my last article, I have nothing new to say about the topic. As well, by the time you read this, we will know the results of our efforts, and will either be planning our program for the coming year or planning to close offices. So I will write about something else.

SSCA is involved with many advisory boards. I sit on the advisory board for Climate Change Saskatchewan (CCS). CCS is Saskatchewan's public education and outreach effort as part of federal / provincial climate change programs. Within the province, CCS has been very busy providing training and classroom resources to teachers throughout Saskatchewan.

One of the interesting aspects of sitting on the CCS board is keeping informed about other climate change initiatives in the province. For example, there are various federal and / or provincial programs promoting energy conservation. The Saskatchewan government provides a PST rebate for Energy Star rated appliances. The province also offers a rebate on Energy Star programmable thermostats. The federal government runs the EnerGuide for Homes program to encourage improved energy efficiency in homes. Recently, I arranged for an energy audit for my home through this program. The inspector came into my house and took notes about my home's features (i.e. insulation levels), and measured how air-tight my house is. I will receive a report in a few weeks recommending how I can improve the energy efficiency of my house (i.e. better insulation, high efficiency furnace etc.). Once the audit is completed, I am eligible for federal and provincial grants for any improvements I make over the next few months.

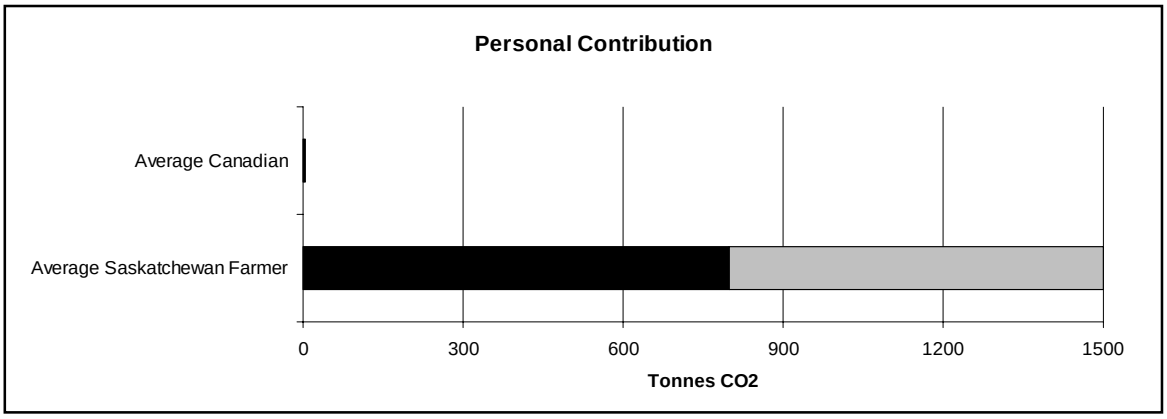

Figure 1. Relative emission reduction contributions of an average Saskatchewan direct seeder and the average Canadian.

CCS has also been active in promoting the national "One Tonne Challenge" in Saskatchewan. As the name

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Saskatchewan Agriculture and Food

Producers Need to Speak with a Common Message on Soil Carbon

By Edgar Hammermeister, PAG
SSCA President Elect

The election has come and gone, the Canadian electorate has spoken and the verdict reveals a Conservative minority government. The final distribution of seats also reveals that the New Democratic Party does not hold the balance of power. The new government will once again require considerable cooperation between parties for government business to be completed.

What are the implications to Canada's Carbon Offset Trading System? That is difficult to say. **Here are the realities**:

1. The Conservative Party election platform stated they would "address the issue of greenhouse gas emissions … with a made in Canada plan… developed in concert with the provinces and in coordination with other major industrial countries". The Conservatives talked about leaving the Kyoto protocol but softened their tones later in the election.
2. The three opposition parties strongly support the Kyoto Protocol objectives (though no one talked about what it could cost the Canadian economy and taxpayer).
3. Canada's international reputation has faltered over the last few years and Canada is becoming quite sensitive to this. Traditionally, countries do not walk away from signed agreements, as the international political cost is too high. What impact would there be on Canada's international credibility?
4. Domestically, Saskatchewan has 12 MPs on the Government side and the West as a whole is well represented. There are a significant number of experienced caucus members from the west. They should have a strong voice.

"If Farmers don't get paid for this value, they will not participate in the Offset Trading System and they have no obligation to."

The Federal bureaucratic process on the Offset Trading System has been at a stand still until the transition of power and policy review is complete. This creates an opportunity to press for changes to the Offset Trading System that cuts bureaucracy and provides incentives for farmers to participate. **With a focused effort, change can happen.**

During Crop Week in January, the SSCA hosted a "grass-roots" industry meeting to provide an update on the "Carbon File". In attendance were representatives from all the grower organizations hosting meetings during crop week and several Ag policy organizations including APAS, the National Farmers Union and the Western Canadian Wheat Growers. The group recognized that **there are issues of common concern to all producers, and on these issues, producers need to speak with a common message.**

We hope to capitalize on this new momentum for the benefit of all producers. Should Canada stay in Kyoto, Farmers could provide considerable value in carbon credits for the nation. If Farmers don't get paid for this value, they will not participate in the Offset Trading System and they have no obligation to. **For every carbon credit not created, Canada will need to buy internationally to meet its Kyoto obligations. The result is Farmers receive no value for the environmental benefits they create and taxpayer dollars leave the country. It is a net loss to the country.** ●

EXECUTIVE MANAGER'S REPORT ... CONTINUED FROM PAGE 2

suggests, this program challenges Canadian citizens to reduce their annual greenhouse gas emissions by one tonne of CO2. While the One Tonne Challenge may not solve the big problem, every little bit helps. This type of program helps encourage every citizen to make their contribution. For an average Canadian, meeting the One Tonne Challenge would not be easy. However, apparently some of us can do it without much trouble. I went to the One Tonne Challenge website and used their calculator to determine my personal emission level and how making changes would help me meet this goal. In my case, working at home a couple of days per week reduced my emissions by about two tonnes. As I guessed, commuting from Regina to Indian Head is not GHG friendly.

Most SSCA members do more than their fair share to reduce Canada's GHG emissions. Since direct seeding removes between 0.5 and 1.0 tonnes of CO2 / acre, a 1500 acre farm removes between 750 and 1500 tonnes of CO2. This also means that the average farmer who direct seeds contributes between 750 and 1500 times more to helping Canada meet its GHG reduction target than the average Canadian (Figure 1). These numbers show why agriculture is expected to play such a major role in Canada's climate change plans. However, just because you direct seed, doesn't mean you shouldn't look at lowering other GHG emissions as well.

If you are interested in learning more about any of the Climate Change Programs or want additional information on the issue go to the Climate Change Saskatchewan website at **www.climatechangesask.com** . ●

Is Carbon to Farmers What Diamonds are to South Africa?

By Darryl Reynolds
SSCA President

I spent my first winter out of high school in South Africa where I visited an uncle and his family, bought a car and traveled around the country having a blast. The week before flying out I decided to sell my car. I saw a "Cash for Cars" ad in the local paper and drove over to check it out. When I drove on the lot, three men came out of the office and in a well-rehearsed act, started to circle the car and tell me what a wreck I was driving and how little it was worth. I didn't say a word. I knew my car was worth $600 on the lot and about $400 trade-in. They offered me $100 and said I should feel lucky to get that for such a piece of junk. I don't know how sitting there with my mouth hanging open made me a nice guy, but they said I was, and offered me another $50. Luckily, I drove off with my car and only a bruised ego and a little life experience for an 18-year-old. Well, I advertised my car in the paper and sold it a couple of days later for $500. Everyone went away happy except for the three used car salesmen. But I'm sure that I wasn't the only sucker to drive onto their lot!

In late January, I was at Farmtech in Edmonton and sat in on a panel of three Alberta aggregators. I went in with an open mind and truly wanted to know what they could offer me as a farmer. The three of them are competitors in the market to buy our carbon credits, collect them and sell them to the Large Final Emitters (LFE's) - the oil, gas and utility companies. They each had ten minutes to describe their companies' business structure and plans. There was no mention of whether they had made promises to deliver carbon at a predetermined price to the LFE's, or whether the LFE's had financed or had ownership in any of the companies. Up to this point all went well. Then they were asked as a panel to tell us what value farmers could expect for the carbon credits they wanted to buy from us, and the wheels fell off the train. The three of them started to walk around my car, and in a well-rehearsed act they started to tell me what a wreck I was driving. "Farmers can't expect much value" (tires are badly worn), "costs are going to be high" (upholstery is torn), "buyers won't pay much" (dent in the hood), "insurance is expensive" (rust in the wheel wells), "we have liability issues" (bumpers damaged), and around and around they went. "How about a $100. You look like a nice kid, here's another $50." Haven't we met somewhere before? Not a word about returning maximum value to the farm gate.

"I can recognize an opportunity when I see one and carbon is an opportunity that farmers should not pass by."

By the time this newsletter is read, I'll be Past President and my 6 years on the board will be over. This is my last chance to stand on the soapbox and say what I feel needs to be done. With 15 years experience in the banking industry, **I can recognize an opportunity when I see one and carbon is an opportunity that farmers should not pass by. The carbon we are selling is in limited supply with a large and growing demand.** There is a $15/tonne cap that only applies to the buyer, not the seller, which has become an artificial price cap. This cap only exists in the first trading period (2008-2012) after which it is gone. In a market with limited supply and excess demand, why would you sell anything into an artificially capped market without a price incentive? **The best thing we could do as farmers is to pool our carbon and control the supply, selling into the market at a controlled rate that maximizes our returns.**

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SSCA ENVIRONMENTAL CHAMPIONS ... CONTINUED FROM PAGE 1

The SSCA played a crucial role in implementing the Prairie Soil Carbon Balance Project. It also participated in the National Climate Change Consultation Process as a member of the Sinks Table. SSCA took a lead role with other agricultural organizations, provincial soil conservation groups, and the Soil Conservation Council of Canada to actively promote the importance of agricultural soil sinks as a strategy to address climate change. The objective of this lobby effort was achieved in 2001, with the acceptance of agricultural soil sinks within the Kyoto Protocol.

More recently, the SSCA has been working to develop carbon market mechanisms for farmers, such as carbon credits and carbon leasing. An emitter of greenhouse gases can lease a carbon sink, created and maintained by a farmer to offset their emissions. Farmers are thus compensated for maintaining this sink. A pilot carbon trade for farmers was launched by SSCA in 2005 through Environment Canada's PERRL initiative.

The work of the SSCA over the last 15 years in promoting soil conservation practices has enhanced Saskatchewan's environment. The near elimination of soil erosion by wind and water on participating farms has greatly reduced the amount of soil in the air, rivers, lakes and creeks.

Scentless Chamomille

By Garry Mayerle, PAg
Conservation Agrologist

Scentless Chamomile is beginning to concern a lot of direct seeders in north-eastern Saskatchewan. In the last few years they have seen it spread enough to wonder whether it could infest crop lands and what kind of problems it will produce. It is a noxious weed. It could cause significant difficulties and expense to deal with.

Some producers have confused it with pineappleweed and wild chamomile. Pineappleweed flowers do not have the outer white ray florets. Wild chamomile flower centres are conical not rounded as in scentless chamomile. Another distinguishing feature is a pineapple odour from crushed flowers of these 2 plants as compared to almost no odour from scentless chamomile.

The last 2 years have been quite wet and scentless chamomile has spread dramatically. It is quite common in parts of the black and gray soil zones. It is often found growing in ditches, fence lines or field edges, sloughs, and depressions. The literature says it likes disturbed areas and Solonetzic soils in areas of high moisture. It is often found in locations where there is less vegetative competition. It does well in higher moisture situations especially if periodic flooding inhibits competitive grass stands. The seeds can be spread long distances by water.

Scentless chamomile propagates by seed and it is a prolific seed producer. One report says over a million seeds per square meter can be produced in a solid scentless chamomile stand. **Three hundred (300) seeds can be found in one flower. It can germinate at any time in the growing season at temperatures between 3° and 40°C.** Soil moisture needs to be more than 10% of soil capacity. Currently scentless chamomile is being seen on field edges but the concern is that it will move into fields. This can happen as harvest equipment catches some of the plants and spreads seed across the field. Cleaning equipment between fields will help to prevent spread. Wind can spread snow a long way so it is also easy to imagine how light weed seeds can be blown out of dry heads and across fields. A study found significant scentless chamomile contamination in many grain samples. Tarping grain trucks could help reduce further spread of this weed. Unfortunately, covering feed stuffs which will sometimes contain scentless chamomile seeds is unpractical. In fact producers suggest that the dehydrated alfalfa industry in parts of NE Sask may be partly to blame for chamomile in the ditches in areas where chopped alfalfa has been hauled from the field to the processing plant. **Once in our soil, seed can remain viable for up to 10 years**.

Scentless Chamomile

Scentless Chamomile can function as an annual, winter annual or a short lived perennial. Studies evaluating yield loss caused by this weed indicate that winter wheat was more competitive and might be used to replace spring wheat acres on infested land. One study looked at the summer annual form of scentless chamomile. At 10 plants / m^2 spring wheat yield was reduced by about 8% in a moderately moist year, by 35% in a cool wet year, and not at all in a dry year. The winter annual form caused these losses to jump to 10% in a dry year and 40% in a moderately moist year. Comparatively the winter annual form of the weed at 10 plants / m^2 caused about 2.5% yield loss to winter wheat in a moderately moist year. Barley is also a very competitive crop. Once canola is established and starts to bolt, it is also at least as competitive as spring wheat. Less competitive crops like flax and lentils would certainly have greater yield losses.

Plants without competition can produce extensive fibrous root systems that hold a lot of dirt and under all but quite dry conditions the plant may continue growth even after tillage. Direct seeders would be hoping to control this weed without tillage. Clark Brenzil provincial weed control specialist indicates glyphosate has activity on scentless chamomile relative to growth stage. Pre-emerge glyphosate applications are important to eliminate giving any scentless chamomile a competitive advantage over the crop. Glyphosate applied at a rate of 0.5 L / ac will get spring seedlings. Glyphosate at 1.0 L / ac will get the winter annual plants before bolting. Once they bolt it is much more difficult to get good coverage and 1.5 L / ac will be required. In-crop products containing Lontrel will give suppression or control. Bromoxynil-MCPA tank mixes also provide seedling control. Refine Extra gives suppression. Ally also provides control but does have cropping restrictions. Certainly there are herbicides to deal with scentless chamomile and it likely won't cause too much economic loss in our competitive crops but we still do not want to build up a seed bank of this weed in our land. There are no good in-crop products for pulses. There is a real danger that an infested pea field for example might

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Variable Rate Nitrogen Application: A Producer Profile

By Rich Szwydky, PAg
Conservation Agrologist

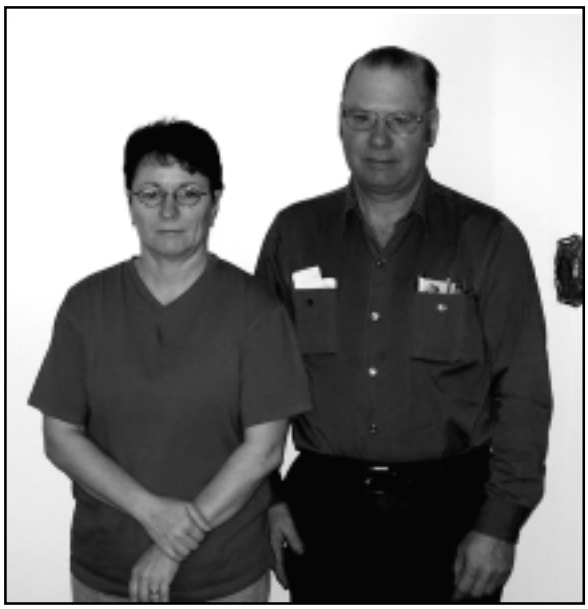
Vance and Fran Simpson of Raymore, Saskatchewan started precision farming in 1997. They currently grow wheat, barley, oats, canola and peas on 4,600 acres in the thin black soil zone. Most of their land base consists of gentle to moderately undulating slopes featuring many knolls and depressions. The Simpsons' decision to use precision farming in their operation was made to increase profits or improve their bottom line. Their hope was that precision farming could net them an extra $10 per acre, either by increasing crop yields or reducing fertilizer inputs. Vance also states he always had a fascination with precision farming technology, and was not afraid to use it on his own farm

Vance understood that knolls and depressions in a variable landscape had differing production capabilities due to variations in soil moisture, organic matter, and inherent fertility status between upper, mid and lower slope positions. The agronomic differences and yield variation between slope positions convinced Vance that yields and nutrient use efficiencies were not being maximized with one general fertilizer application rate across an entire field. Vance realized that, over time, a single fertilizer rate across the entire field might have caused the low slope positions to be under-fertilized and the high slope or knolls over-fertilized. As a result, Vance decided to investigate the merits of precision farming.

To make precision farming viable on the Simpson farm, Vance said they had to invest in the necessary equipment. Following the purchase of two new Case IH 2188 combines in 1997, they began precision farming. The combines were equipped with the full AFS (Advanced Farming Systems) option, which included a yield monitor to gather yield and moisture data, as well as a global positioning system receiver to record the exact location of that data in the field. Elevation data is also calculated and recorded with this system.

In 1998 Vance purchased a Flexi-Coil 50 series air cart with three tanks and the variable rate option. This option gave Vance the ability to automatically change rates "on the go" in the field.

In 2001 Vance upgraded his equipment, trading his Case IH 2188 combines for two Case IH 2388 models that contained factory yield monitors. He also made the switch into low disturbance direct seeding when he purchased a 57 foot Flexi-Coil 5000 air drill. The air drill was fitted with side band openers that apply seed and dry fertilizer on nine-inch row spacing.



Vance and Fran Simpson of Raymore, SK.

With the equipment in place for precision farming, the next step was to make use of it. 1997 was the first year that yield data was gathered. The yield results were then downloaded into the Case IH AFS software package, to generate yield maps.

Instead of precision farming all their acres, the Simpsons decided to precision farm only about 1000 acres. Dr. Dan Pennock of the University of Saskatchewan's soil science department recommended the Simpsons delineate three management zones on these fields. To delineate management zones based on slope position, the U of S Soil Science department used image analysis software on black and white aerial photos of the precision farmed fields. This analysis separated the knolls from the depressions by the differing grey-scale shades on the image. Light coloured areas represented the knolls, while dark coloured areas represented the depressions. Three benchmark sites, representing each slope position, were chosen from each field and then soil sampled to determine nutrient requirements. The resulting soil test recommendation for each slope position was then extrapolated to represent low, mid and high slope positions for the whole field.

The next challenge was to write a prescription that represented the nitrogen fertility requirements for each slope position. The fertilizer rates, blends and prescriptions were developed with the assistance of Zane Lewchuck (SAF), and were entered onto special software by Vance himself. The prescription is then downloaded on to a card that is installed in the controller mounted in the tractor. This prescription card, along with the GPS receiver from the combine, allows variable nitrogen rate changes to occur at that particular point in the field.

The analysis of the yields resulting from using variable rate fertilization across differing slope positions was conducted by Zane Lewchuck. Vance said the results of the 1998 precision farming venture were encouraging, but somewhat variable. The yield differences between slope positions were generally extreme, especially with canola where the lower sloped positions significantly out-yielded the upper slope positions.

In 1999, Vance reviewed the previous year's results, and thought the three

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Mid-Row Banding or Side-Banding: The great debate….

G. P. Lafond - Indian Head Research Farm; S. A. Brandt – Scott Research Farm; C. A. Grant and B. Irvine - Brandon Research Center; G. Hultgreen – PAMI; A. M. Johnston – Potash and Phosphate Institute; R.Lemke - Swift Current Research Center; S. S. Malhi – Melfort Research Farm; W.E. May – Indian Head Research Farm; J. J. Schoenau – University of Saskatchewan; J. T. Harapiak – Retired WESTCO agronomist.

Summary

The Bourgault mid row band and the Flexi-Coil Stealth sideband systems were compared for agronomic performance with wheat, canola and flax at four Saskatchewan sites over three years (2000, 2001, 2002). Urea and anhydrous ammonia (NH_3) were the nitrogen (N) sources and 11-51-0 was the phosphate source. All N fertilizer was side banded with the Flexi-Coil Stealth system while all N fertilizer was mid row banded with the Bourgault system. Phosphate fertilizer was seed placed with the mid row band system, side banded when used with side band urea and seed placed when used with side band NH_3.

Overall there were no grain yield differences between the systems 84% of the time and where there were differences, there was almost an even split between the systems. Similarly, there were no differences in grain protein due to mid row band or side band. Urea provided slightly higher grain yields compared to NH_3 at Indian Head but not at Swift Current, Scott, or Star City.

The good news is that with both seeding/ fertilizer systems, the agronomic results are excellent. **[Note: The summary was copied directly from the Research Update #761 published by PAMI. The full report can be viewed on the PAMI website under downloadable reports at the following address: http://www.pami.ca]**

Some key steps in successful crop production involve timeliness of seeding, adequate fertility and optimum plant populations. In turn, final plant population is governed by factors such as seed quality, seeding rate, seeding depth, adequate packing[1] (75 lbs force for wheat and canola), speed of seeding and within the context of one pass seeding and fertilizing systems, the separation between seed and fertilizer to minimize seedling injury. Recent work with different bolt-on side band openers has shown only small differences in plant populations at different rates of nitrogen (N). When differences were observed between the various openers used in this particular study, the Flexi-Coil Stealth^{tm} and the GEN200^{tm} opener provided better crop establishment[2].

The interest in seed / fertilizer separation is due to the high risks of seedling damage if too much nitrogen is applied in the seed row. Given the interest in applying all nutrients at time of seeding in no-till systems, especially as rates of N increase[12], it is imperative that some separation occur between seed and fertilizer N to minimize seedling damage. The question then becomes, how much separation is necessary to avoid damage and can separation be ensured under a wide range of soil types and soil moisture conditions.

Three common sources of N are used in Western Canada, anhydrous ammonia, urea and urea-ammonium nitrate. In terms of damaging potential to seedlings, anhydrous ammonia > urea > urea-ammonium nitrate. When anhydrous ammonia is applied to soil, it will react with water to form an ammonium ion (NH_4^+). The soil moisture content will influence this rate of conversion. Clay textured soils tend to hold more water which in turn influences how fast the ammonia is converted to the less damaging NH_4^+ form. The longer the N stays in the ammonia form, the greater the potential for losses and damage to seedlings. It should be noted that if ammonia is applied to clay soils of high moisture content, some ammonia can be lost to the atmosphere due to poor furrow closure behind the injection point as a result of poor soil flow. With urea, it has to be hydrolyzed by the urease enzyme present in the soil for the release of ammonia to occur. Upon hydrolysis, the same conditions apply as for anhydrous ammonia. When urea is applied to a moist soil, it will dissolve and move into the soil away from the injection point thereby lessening the potential damage to seedling after hydrolysis occurs. When applied to cool soils, the rate of conversion is also greatly reduced due to the depressing effects of low temperatures on enzyme activity.

Other important factors to consider are soil pH and calcium carbonate content of soils. pH values ranging 7-8 are optimum for urea hydrolysis. Soil with high levels of calcium carbonates will reduce the fraction of NH_4^+ absorbed to clay particles and the reaction of calcium carbonate with NH_4^+ increases the release of ammonia thereby increasing the potential for seedling injury. Others factors to consider are crops and row spacing. Oilseeds are more sensitive than cereal crops and when using wide row spacing, the concentration of nitrogen near the seed row will be higher increasing the risks of seedling injury.

Over the past 18 months, a lively debate has emerged on the issue of fertilizer placement and more specifically about whether mid row banding might be superior to side banding. **The objective of this article is to shed some light on this debate and to address three specific issues:** 1) the effects of side banding and mid row banding on crop establishment 2) the effects of side banding and mid row banding on seed yield and; 3) the question of whether a minimum of 2" x 2" separation between seed and fertilizer is actually necessary to ensure safety of seedlings and optimum crop production. The recommendation for a 2" x 2" separation comes from Manitoba Agriculture, Food and Rural Initiatives and reflects the viewpoint that soils in Manitoba have a greater proportion of carbonated or calcareous soils and Manitoba producers tend to be more aggressive in their N rates than Saskatchewan producers. For more information refer

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Report on NE Riparian Project

By Garry Mayerle, PAg
Conservation Agrologist

Finding ways to managing riparian areas for profit and for the environment is the goal of the Green Cover Project: Riparian Management in a Cultivated Landscape. It targets large crop producers in the parkland and prairie area of Saskatchewan. These producers would be seeding up to 5000 acres or more and are focused on crop production on good quality land. With their focus on growing annual crops, most of these producers do not have any plans to be in livestock production.

We know producers can better manage riparian areas for the environment. Water quality is becoming more and more important to the Canadian public. Recent events like Walkerton, ON and North Battleford, SK are fresh in the minds of Canadians. A riparian areas acts as a filter for water entering the water way at the centre of the riparian area. It also protects the water course by slowing down water movement.

Three demonstrations were established last year. One is at the Northeast Agricultural Research Foundation site on the Melfort Research Station. This site includes a trial to measure and demonstrate the erosion protection different annual cropping scenarios would provide the riparian area. One comparison looks at protection for the riparian area with 3 different annual crops: a pulse, an oilseed, and a cereal. The other part of this trial compares direct seeding to a conventional cropping system. Also established at the site are different forage mixtures used to square up the field. The site is established at one corner of the field next to the creek and there is quite a bit of salinity in the area. A new salt tolerant forage variety was planted in the most saline area of the site. The variety is a hybrid of Quackgrass and bluebunch wheatgrass. Fortunately all the forages established very well at all 3 sites in this project. Record summer rainfalls make getting forages established quite easy!

Another site at Armley close to Nipawin is set up on land of a producer who does have cattle. The field was in annual crop production and will demonstrate how putting forage down in the meanders around riparian areas can protect the riparian area and help it function and protect the water way better. It also makes the operations involved in annual grain production more efficient. And on top of all that, there is some feeding benefit for livestock production. One of the big questions is the cost of fencing and watering those livestock. The goal is to see if grain producers could provide enough value on fields like this to entice livestock producers to pay to graze these fields after harvest. Other considerations are cattle tracking in a wet fall, and whatever else might impact the direct seeding operation and yield of the field next year. Five species including alfalfa, fescue, meadow brome, and intermediate wheatgrass have become well established at this site.

This Riparian Management Project was set up to focus on the Carrot River watershed. The Carrot River starts close to Wakaw, flows by Kinistino and on between Nipawin and Tisdale to the town of Carrot River where it dumps into the Saskatchewan River close to The Pas, Manitoba. One other site in the project is along the river close to Kinistino. This site demonstrates a forage buffer strip protecting the riparian area that will be used for grazing but might also have a fit for baling.

As mentioned before it is relatively easy to argue the environmental benefits of protecting riparian areas but much more difficult to find profit in managing these areas properly. It is the goal of this project to test and demonstrate the profitability we think is there. ●

SCENTLESS CHAMOMILLE ... CONTINUED FROM PAGE 5

need to be taken out because scentless chamomile is a noxious weed.

Time of control must not be delayed with scentless chamomile. Flowers can be produced within 58 days of germination. Viable seeds are formed by the time petals start to expand. Flowering is indeterminate so at any time a plant can have flowers, immature and mature seed. Another option to help reduce the spread of this weed is to **mow ditches and patches just before the flowering stage.** Mowing after flowering will likely just spread the seed as flowers severed from the plant have a very good chance of still producing viable seeds especially if weather conditions are wet. If a producer is starting to see just the odd plant it is certainly advisable to hand rogue. Care should be taken to collect the weeds and burn them to prevent the roots from becoming reestablished in the event of moisture or the flowers from releasing viable seed. There is no point in spending time picking armfuls of flowering scentless chamomile and then dumping them on the side of a creek or throwing them in a fenceline. Some seed will most likely still be released and spread to the environment.

One producer in the Tisdale area has developed a practice of mowing ditches next to his cropland closer to the end of the growing season. This cuts off any plants before they go to seed. He has even seen a significant reduction in Canada thistle stands after cutting them off at the flowering stage. Right after harvest he sprays one litre plus of glyphosate with a 10 foot boom around the borders of his fields to control any weeds from creeping into the fields. He feels that mowing the grass in the borders reduces the chance that it will be wiped out by glyphosate drift. Keeping this grass competitive keeps other undesirable plants from becoming established. Scentless chamomile has become evident in some neighbouring fields but he hasn't seen any in his fields so far. ●

Managing Crop Residues for Beef Cow Winter Feed

By Juanita Polegi, PAg
Assistant Manager & SE Conservation Agrologist

Running a beef cow herd together with an annual crop operation is what many Saskatchewan farms have been doing successfully for decades. But as the margins of both sectors narrow, finding new ways to combine the operations is becoming increasingly important. Over the last few years, farmers have been looking at better utilizing crop residues as a winter feed source for cows. Developing and implementing inexpensive methods for providing the feed to the cows and ensuring they eat it has sometimes proved a challenge. A new implement to bolt on to the rear of the combine might prove to be the very feature that will marry the two objectives.

View of the Whole Buncher attached to the combine. Photo courtesy of Lorne Klein.

In the spring of 2005, Lorne Klein, a Forage Development Specialist with Sask Ag & Food, approached the SSCA about running a project through the Greenhouse Gas Mitigation Program. The purpose of the project was to find 6 cooperators from around the province who would be interested in trying out an implement called the Whole Buncher. The implement is bolted on to the rear of the combine and catches the straw and chaff, dumping piles across the field for cows to graze in the winter. The SSCA agreed and the cooperators were soon found. Field tours with each cooperator were held in December to view the implement and the piles it left. Lorne also attended each tour and presented information on winter feeding alternatives.

One of the first statements Lorne made in each of his presentations was that "winter grazing enables the cows to do the work". He went on to caution, however, that **winter grazing requires a higher level of management**; that it's not about leaving the cows out on pasture for an extra month without grass. It's not about starving cows. And the success with which winter grazing can be achieved cheaply depends entirely on the stage of pregnancy of the cows. If the cows are in the 3rd trimester or lactating during the months of January through to March, they need a much higher level of nutrition than those in the 2nd trimester. Cows in the 2nd trimester are, therefore, more suited to winter grazing.

Lorne indicated there are 4 ways to have cows graze through the winter including swath grazing barley and oats; grazing native range; grazing seeded grass; and grazing crop residues. He concentrated mainly on grazing crop residues.

Grazing crop residue piles in the field is a viable and economical alternative to moving the cows into a dry lot, bringing the feed to them and then hauling out the manure. They distribute their own manure, thereby eliminating the manure hauling costs. Not all cows, however, can adapt to winter grazing. The herd needs training, especially in the first year.

Depending on the nutrient content of the crop residue piles and the condition of the cows, supplement feed may be required. He also pointed out that it's best to run some wire down the field so that the cows don't have access to all the piles at once. Many producers who have implemented this method for winter feeding find that they move the wire every 5 to 7 days

Lorne discussed the Whole Buncher, sharing some of his observations and those of the cooperators. The Buncher can be mounted onto conventional or rotary combines but seems to work really well on the rotary. It's like a giant pitchfork on the back of the combine with spring steel fingers collecting about 150 lbs of straw and chaff together and then dumping the material into a pile. The piles are relatively small but are easy for the cows to get at. While the device looks easy to build and set, it isn't. The cooperators agreed that it takes about an entire day to mount the unit and get the proper setting. There were problems fitting the mounting brackets on the different makes & models of the combines. Adjustments often had to be made. Much of the problem stems from the fact that axel widths vary between exact model combines. So while the manufacturer can be told the make and model of a particular combine, the axel measure-

Whole Buncher in action. Photo courtesy of Lorne Klein.

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SSCA Involved in New Greenhouse Gas Study

By Eric Oliver, PAg
Conservation Agrologist

SSCA is participating in a new three year greenhouse gas study. The study will be looking at the three main greenhouse gases - carbon dioxide, methane and nitrous oxide, in cropland, riparian and wetland landscapes. The project is jointly funded by Agriculture and Agri-Food Canada and Ducks Unlimited Canada. In addition to two sites in Saskatchewan, this study is also being conducted in Alberta, Manitoba, Ontario and Nova Scotia. Extension organizations like ours are cooperating in other provinces to help get the field data to the researchers and information to the farmers. Nearly all of our agronomic research and greenhouse gas research comes from research plots. Farmers farm landscapes. This project will help to put greenhouse gas emissions, carbon sink potentials and farming systems into a whole landscape context.

So what does this study mean to the farmer? Well, greenhouse gas emissions, especially nitrous oxide emissions from agriculture land, are an area of concern for agriculture as a whole. Although a lot of focus has been on carbon dioxide, as a greenhouse gas, methane is about 21 times and nitrous oxide is 310 times more potent than carbon dioxide. Although agriculture cropland is now generally accepted to be a carbon sink, that is we are taking carbon dioxide from the atmosphere and storing it in the soil as carbon, the focus will be turning to nitrous oxide emissions from agriculture land. This would primarily involve losses from nitrogen fertilizer. Research is currently being conducted on this issue and initially, it is looking like the international coefficients used to allocate nitrous oxide emissions are higher than they should be for western agriculture lands. However, wetlands and riparian areas may also be problem areas with high release of nitrous oxide emissions when tilled or when the land around the riparian area is farmed or tilled.. For this reason, this study is looking at greenhouse gas emissions from these susceptible areas as compared to the adjacent cropland at different landscape positions (crest, mid-slope and foot slope). It should be noted that wetlands can be sloughs that may dry up during the year, but usually contain water most springs.

Eric Oliver using a syringe to extract greenhouse gases from the collection chamber.

The study involves taking gas emission samples from the soil at timed intervals within a 45 minute period, at four key times during the year. This includes early spring (just after thaw), mid-spring (post seeding), late summer (before harvest) and mid fall (after harvest but before freeze-up). Other samples taken include soil, water chemistry, crop yield, plant identification, riparian vegetation sampling, crop residue sampling and weather data. The sampling will take place at three positions in the landscape of cropland (crest, mid-slope and foot slope) and three positions over the riparian and wetland area.

It's a big project but it can help us understand the level of greenhouse gas emissions from cropland at different landscapes as well as the wetlands and riparian areas. Although wetlands and riparian areas make up a much smaller area than cropland, these areas may well have a much bigger impact on nitrous oxide emissions, especially when tilled. It is generally assumed that there is an economic cost associated with maintaining wetland and riparian areas and there is no economic benefit to the producer, although there is a societal benefit to maintaining these areas. This study will quantify the amount of greenhouse gas emissions from these areas which will help develop best management practices for maintaining them. The study will also quantify the consequences of farming through such areas. The amount of emissions relative to the cropland landscape will also be important to understand as well as impact of riparian width between cropland and wetlands. The economic effect on the producer may be a little hard to determine at this point but gaining an understanding of the consequences of farming through these sensitive areas with respect to greenhouse gas emissions may very well prove beneficial in the long run. If ever a cost is directed to producers for greenhouse gas emissions, this study will become very important to producers. By understanding the emissions from all areas of the landscape, producers can employ various best management practices that will minimize these emissions. ●

IS CARBON TO FARMERS WHAT DIAMONDS ARE TO SOUTH AFRICA? ... CONTINUED FROM PAGE 4

Of course our detractors will start calling us names to try to divide and conquer us. I can hear it now, "Canadian Carbon Board", "National Carbon Union" and "The Prairie Carbon Pool". Now for those of us with a left lean, this will be no problem and may be a badge of honour. But for those of us with a right lean, this could be effective in dividing us.

So I have a business model we could emulate (for the right leaners) that really isn't much different than the pooling idea (call it a pool if you lean left) except it is capitalistic enough to make even Donald Trump giddy at the thought of such market power. Let's say every farmer on the prairies has a small diamond mine on his farm and each winter we mine out a handful of rough diamonds. We take them to our three aggregators (who buy from all the individual farmers and sell to the LDB's-Large Diamond Buyer's). Although there is more demand than supply, they can play us off against one another and keep the price they pay low. We'll never know the price they sell them to the LDB's as that price is kept secret. Then they tell us, "it costs a lot to cut and polish your diamonds", "can't expect much", "insurance is expensive", "buyers can only sell them for 3 days salary", and "50% of all diamond's sold comes back on the market within 7 years." You get the picture!

In the business world, there are few examples of a company getting so much power in the market that it becomes a gorilla. I was at the Omaha Zoo a couple years back and was fascinated by the silver backed (male) gorilla. He was so powerful and strong that you were in awe by his very presence. There was no doubt who was in control of that enclosure and the smaller gorillas were always aware of his whereabouts and lived by his rules. A group of teenaged boys started calling him names from up above and he just looked up with an icy stare and you could almost hear him say, "Well, why don't you come on down and we can talk about it!"

When I was in South Africa, I was introduced to the diamond industry and there is a gorilla company that is powerful enough that all the smaller companies fall into line or are quickly brought into line. The company was started by Cecil Rhodes (as in Rhodes Scholar, Rhodesia) and is called De Beers. And I quote from their website, "In its early years, when the company produced over 90% of the world's diamonds, it was able to control the production and hence the supply of diamonds almost at will. Then, from the beginning of the 20th century, when rival producers began to challenge its preeminence, De Beers used its still-dominant position to co-ordinate and regulate the supply of diamonds in pursuit of price stability and consumer confidence." (I think Dave Schultz used to "coordinate and regulate" for the Philadelphia Flyers!) They are a big player that can throw their weight around and control the world's supply of diamonds. They feed the market enough diamonds to extract the maximum value for all producers. They don't sell one diamond for a dollar less than the market will bear. They made us all believe that we need to spend 3 months salary for a new diamond ring (not 3 days) and that no new bride should accept a recycled diamond ring from a failed marriage. What market power!

> **"The best thing we could do as farmers is to pool our carbon and control the supply, selling into the market at a controlled rate that maximizes our returns."**

I think **farmers need to take control of the soil carbon issue** and become that gorilla. **We need to work together on this issue (left and right) to extract the most value for all farmers.** You know everyone says it can't be done. They say we're like herding cats or like a wheelbarrow of frogs that all jump out before we get anywhere. Maybe they're right, maybe not. **The prairies have 85-90% of the soil carbon available for domestic trade in a market with more demand than supply**. We have been excluded from the international market (LFE's can buy our credits and sell them internationally for a higher price) and had an artificial price cap imposed on us for the first trading period. **If we poured all our carbon credits into one pool, bank, mutual fund (whatever you want to call it) and controlled the supply, we could extract the maximum value from the market at the lowest cost and return the most money back into farmer's pockets.** The first thing about being a gorilla is to recognize that you're a gorilla, and then to start acting like one. You can't be too unruly or the handlers might put a dart in you, but if you throw your weight around a little and let the other gorillas know who's in charge, we could all get along just fine.

In conclusion, I believe farmers have to organize behind one entity (could SSCA be that entity?), cut the middlemen out and extract more value out of the market than the artificial $15 / tonne cap. **Wouldn't it be fun for once, as farmers, to be the big gorilla?** I'm tired of being put down and having people feeling sorry for me because I chose to farm. I'm proud of who I am and what I do. **I truly believe we could be the dominant player in this market if we choose to be and with our size we could extract the true value for our soil carbon and stop being a price taker for once!**

Is Farming Viable in Canada?

By Tim Nerbas, PAg
Conservation Agrologist

Many producers are starting to believe they have run out of options. They have lowered costs of production, diversified crop rotations and increased livestock numbers all in an effort to become more cost efficient. Yet cash flow is tighter now than it was at almost any other time during the last century. Frustrated, producers are looking at their future and considering other employment opportunities. Is farming still viable in Canada?

In Saskatchewan, realized net income was negative in 2003 and 2004 and expected to be negative for yet a third year in a row for 2005. The last time realized net income was negative was during the "dirty thirties". From 1931 through 1933 there were three consecutive years of negative realized net income. So we've been here before, albeit not for over 70 years. Perhaps our present skid is a sign of brighter things to come, as happened during the more prosperous1940's. Or is agriculture in a state where wholesale restructuring must occur?

During the 1970's producers were encouraged to specialize, whether it be grain or livestock. For many that meant getting out of livestock and breaking up pasture land to become more efficient in crop production. During the 1980's crop diversification was the name of the game. Saskatchewan producers became true innovators. Producers adopted pulse crops such as peas and lentils. In 1981 there was approximately 120,000 acres dedicated to these two crops. By 1991, this had increased to 640,000 acres, and by 2005 nearly 5 million acres were seeded to pulse crops in Saskatchewan.

The result: wheat is no longer the king it once was. Approximately 20 million acres were seeded to wheat in both 1981 and 1991. By 2005 there was only 13.5 million acres seeded with 4.8 million dedicated to durum production. Besides pulses, more oilseeds are grown today. In 1972 and 1982 approximately 1.5 million acres of canola were seeded annually. By 1992 there were 3.7 million acres and 2005 saw the second highest seeded acreage ever at 6.5 million acres. Another 1.6 million acres was dedicated to flax production and approximately 6 million were seeded to a couple of old standbys, barley and oats. Greater crop diversity has been the name of the game the last 20 years. As well, thanks in large part to BSE, our cattle herd is at an all time high: 3.66 million animals.

And yet, despite our best diversification efforts, we stand on the eve of negative net realized income for the third year in a row. We've driven combines to Ottawa and protested on the steps of many government sanctuaries, but what did we accomplish? A number of bailouts over the years saved many to farm another day, but did anything really change? There are now more producers and their families working off-farm jobs than ever before, just to support their farming habit. So what are we doing wrong?

Agriculture as a whole is making money. Most companies involved in either the supply of inputs, be it fertilizer, seed or pesticides, or the movement and processing of grain or livestock are making record profits. The problem is the price squeeze falls at the farm gate. On the input side, companies have increased the cost of fertilizer, seed, pesticides, and iron because their costs increased and their goal is to take as much profit as the market can bear. On the production side, we are price takers. We are unable to pass these increased costs up the value chain. As producers we are a lot of small companies dealing with a few large multinationals. Their goal is to source the raw materials for the lowest possible cost. If their costs go up they have some ability to pass those costs on to the consumer and still maintain growth and profit margin. This is not possible at the farm gate.

Producers may not benefit from this system, but other areas of the economy certainly do. Big companies pay taxes. They also create many jobs, and all of those employees pay taxes. And of course the system maintains a cheap food policy. Canadians spend the lowest percentage of income on food than virtually anywhere else in the world.

And maybe that's part of the problem: producers still think of agriculture as being in the business of food production. But there is a much "greener" side of agriculture that is becoming increasingly important and potentially profitable: energy and the environment.

As producers we have a huge land base or as some call it, solar collection capability. Every year we convert huge amounts of solar energy into bio-energy food stocks. Through photosynthesis, large amounts of CO_2 are taken from the atmosphere and stored as plant biomass**. In fact in Saskatchewan and in Canada as a whole, farming has 101,000 and 260,000 square miles of solar collection capability, respectively**. Those are big solar collectors.

Today governments and companies are pushing forward with bold initiatives for ethanol and biodiesel. Producers have the ability to play a significant role in the production of this kind of energy. **Our ability to collect the sun's energy and turn it into plant biomass can provide a renewable energy source**, unlike the depleting stocks of fossil fuel energy. For

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New Director-at- Large Welcomed

By Eric Oliver, PAg
Conservation Agrologist

One of the newest additions to the SSCA Board of Directors is Garry Noble in the role of Director-at- Large. Garry, his wife Antoinette, and their three children, have taken over the family farm near Mitchellton, which is east of Mossbank or northeast of Assiniboia in the Brown Soil Zone of southwestern Saskatchewan. Although this will be Garry's fourth year as a full-time farmer, he has been part of the farming operation since 1989. Garry spent 14 years as an Extension Agrologist with Saskatchewan Agriculture and Food in Assiniboia. He took a leave of absence for the summer of 2003 to farm more full time and returned to work at SAF for the winter. In May of 2004, he became a full-time farmer but had started direct seeding in 1994. Garry uses five crops in a rotation; wheat, durum, flax, lentils and peas. He finds cropping rotations and how each crop best fits into a particular rotation fascinating but complex.

One aspect Garry discovered after becoming a full time farmer is how quick it is to lose touch with information. When he was an Extension Agrologist, he was constantly exposed to new ideas and information in the course of his job. He quickly discovered that as a farmer he has to make a concerted effort to seek out information and finding relevant information is much harder. Garry thinks the SSCA could expand on its role of providing the membership with the latest information on direct seeding, precision farming, crop rotation, and equipment technology for dryland farming

Garry Noble

Garry and Antoinette hold the philosophy that they are not just farming for themselves, but also for their children. "Not many kids will have an opportunity to farm and we want our kids to have that option should they choose to farm" explains Garry. It is obvious that the Noble's view their farming operation as one where the land is a precious and important aspect to the environment and their stewardship of the land is important to not only themselves, but future generations as well.

Garry became a member of SSCA in 1993 and appreciates the efforts this non-partisan farm organization has made in agriculture. He is pleased to join the Board of Directors and help direct its future. I have known Garry for many years and he has always been one who is not satisfied with the status quo and is always looking for ways to make things better. He has a knack for providing a different insight into things and making suggestions others may have missed. Welcome Garry.

MANAGING CROP RESIDUES FOR BEEF COW WINTER FEED ... CONTINUED FROM PAGE 9

ments it uses to design the mounting brackets for the Buncher may not match. Overall, however, once the Buncher was finally set, it worked fairly well (although one cooperator learned that backing the combine with the Whole Buncher attached resulted in a very crumpled Buncher!).

In terms of the potential for the Whole Buncher or something like it, Lorne said, "I believe this system could be the breakthrough with crop residue because when the combine leaves the field, there's no more expense – no more diesel fuel and the piles are high enough the cows can find them, even with 2 feet of snow".

Lorne also mentioned a side benefit that has been found with grazing crop residue piles in the winter. According to a study conducted at the Western Beef Development Centre (WBDC) near Lanigan, **land that had some kind of winter grazing on it received a bonus $2.25/cow/month worth of Nitrogen** over hauling the manure out of the corrals and then spreading it.

Piles of straw and chaff left in the field by the Whole Buncher. Photo courtesy of Lorne Klein.

The success of the marriage between a cow herd and grazing annual crop residues depends largely on when the cows are going to calve. There are fewer opportunities to winter graze cows that are calving in January & February than those who will calve in May & June. While winter grazing is not for every cow herd or every producer, for many of those implementing it, the system is enhancing the bottom line of the cow herd, reducing some of the labour for the producer and returning nitrogen to the land in an environmentally friendly manner. A win-win situation all around.

For more information on winter feeding alternatives, contact Lorne Klein (306) 848-2382.

VARIABLE RATE NITROGEN APPLICATION: A PRODUCER PROFILE ... CONTINUED FROM PAGE 6

delineated management zones might be too refined. Dr. Dan Pennock suggested that Vance go down to two management zones - an upper zone and a lower zone. Technicians at the U of S Soil Science department again used image analysis software to help delineate the two zones on the precision-farmed fields. Soil tests were taken at 15 mid slope positions on the quarter and then analyzed. The upper management zones received the recommended nitrogen rate, while the delineated lower slope management zones received anywhere from 1.5 to 2 times the recommended nitrogen rate, depending on the crop. For example, on a canola crop in 2004, the upper slope positions received 80 lbs / acre of actual nitrogen, while the lower slope positions received 110 lbs / acre of actual nitrogen.

Vance currently uses this two-management zone system. He states, it is a much simpler to use because it reduces the number of management zones per field. Since beginning the two management zone system, Vance said he is not seeing significant variation from the lower to the upper slope positions with the cereals. In one wet year, however, Vance claims that canola in the lower slope positions significantly out-yielded the canola in the upper slope position. In fact, on this particular field, Vance claims that precision farming gave him an extra economic return of approximately $9 per acre compared to the constant check strip. Vance cautions this was an exceptional year for moisture, and that moisture is required to make precision farming work.

The Simpson's 57' Flexi-Coil 5000 air drill with the Flexi-Coil 50 series air cart. The air cart has three tanks and the variable rate option.

Vance continues to experiment with variable rate technology. His latest venture is a three-year partnership with the Indian Head Agricultural Research Foundation (IHARF) and Agriculture and Agri-Food Canada. This project utilizes previous yield maps along with satellite imagery to delineate management zones. The imagery uses a Normalized Difference Vegetative Index (NDVI) to measure biomass production on the previous crop. This production is then correlated to the yield maps. Once the management zones are delineated, soil tests are conducted. Six different nitrogen rates are determined, and then superimposed into each zone to determine response. Dr Guy Lafond, a production systems agronomist with IHARF, states the results generated midway into this project seem encouraging. More research, however, is required.

Vance cautions producers about the costs associated with purchasing precision farming equipment, and cautions producers to ensure the technology is user friendly, quick and reliable. The biggest barrier to precision farming is not the technology itself; it is linking that technology to the agronomy of crop production. There are a number of methods, producers can use to practice precision farming and site-specific management on their own farm, but what works well for one producer, may not work too well for others.

Vance will continue to use precision farming in his operation. He states there has been a huge learning curve, and remains optimistic that the potential for this technology could be unlimited. ●

IS FARMING VIABLE IN CANADA ... CONTINUED FROM PAGE 12

instance **a bushel of wheat (60 lbs) contains approximately 430,000 BTU's** (British thermal energy units). In comparison, an imperial gallon of propane contains approximately 110,000 BTU's; one gallon of heating oil contains approximately 165,000 BTU's.

That's just the energy side of the green movement. Another aspect that often gets lost in the shuffle is the resource farmers provide as stewards of a huge land base in Canada. Farming has changed significantly over the years. **In Saskatchewan, summerfallow acreage has declined steadily from a high of 24 million acres in 1970 to just 6.3 million acres in 2005.** The result is less erosion from wind and water, thereby improving the air we breathe and the water we drink. We have improved our use of nutrients as well. With the increase in direct seeding over the last decade more nutrients are applied at seeding which improves fertilizer use efficiency.

Canada's attempts to reduce its green house gas emissions could mean some business opportunities for farmers because these changes in production provide the potential to store large amounts of $C0_2$ in the soil as organic matter. Will this bring some value to the producer? Only time will tell. But agriculture can definitely be part of Canada's solution to reducing green house gas emissions.

As energy prices surge, producers must see themselves as part of the energy solution. We have a large renewable solar collection system. Our best management practices are protecting the environment. Producers have some very real green solutions to offer the world as we move forward into the 21st century. Changes in Ag policy and the producer's ability to pass along incremental costs of production will be key to the success of agriculture at the farm gate in this new sector. **The road to the long term viability of farming in Canada may lie not so much in changing what we're doing, but rather in changing the purpose of why we are doing it.** ●

Hard Reality at the CLC

By Laurie Hayes, MSc, PAg
Manager, Conservation Learning Centre

It is frustrating to hear about the challenges that the SSCA is facing. The CLC can only echo the same sentiment. This winter, we took a very hard look at the CLC's financial situation (again) and discovered some facts that were very unsettling. We realized that the CLC is truly a microcosm of what is happening on all farms – funding from all the other CLC projects have been subsidizing the farm – just like producers who have off-farm income.

To really put things into black and white (or, as you will see in the table below, red), we did a gross margin analysis of the crops grown on the land we own. The basic calculations are: Gross Product – Direct Costs = Gross Margin

Gross Margin – Overhead Costs = Net Profit / Loss

	Hard White Wheat	Barley	Canola	Flax (projected)[1]
Gross Product				
Actual Yield (bu)	50	67	32	20
Actual Prices ($/bu)	$1.92	$1.25	$5.00	$6.00
Gross Product ($/ac)	**$96**	**$84**	**$160**	**$120**
Direct Costs[2]				
SeedCosts	18	9	32	17
Chemiccal Costs	33	35	23	33
Fertilizer Costs	43	43	43	43
Ffuel Costs	9	9	9	9
Miscellaneous[3]	46	49	45	41
Total Direct Costs ($/ac)	**$149**	**$144**	**$153**	**$142**
Gross Margin ($/ac)	**($53)**	**($60)**	**$7**	**($22)**
Overhead Costs[2]				
Land Payments ($/ac)	30	30	30	30
Equipment ($/ac)	28	28	28	28
Taxes	5	5	5	5
Interest	2	2	2	2
Total Overhead Costs ($/ac)	**$106**	**$100**	**$112**	**$100**
Actual Net Profit/Loss (S/ac)	**($159)**	**($160)**	**($105)**	**($122)**
Total Acres of Crop	53	35	110	58
CLC Profit/Loss per Crop	**($7,919)**	**($5,267)**	**($11,098)**	**($6,487)**
Total Profit/Loss	**($39,771)**			

[1] Flax income is 'projected' because it is still standing in the field.

[2] Direct and overhead costs are a total of our actual cash costs as well as the in-kind contributions we received for seed, chemicals, fuel and equipment rent. While the CLC is not a 'typical' farm, most expenses (other than labour) will be similar to yours.

[3] 'Miscellaneous' direct costs include crop insurance, general insurance, equipment repairs and maintenance, field supplies, soil tests, custom applications and trucking.

As mentioned, we received in-kind sponsorship for some costs and that contribution totalled $9,516, reducing our actual total loss to $21,255 – not that that is any comfort to anyone who doesn't get sponsorship.

We did projections for 2006. They don't look any better.

We evaluated what we are doing and what it is costing us and decided to stop doing what isn't working. Some of the solutions for the CLC: reduce cropped acres; rent out land; seed forages; cut projects and programs; and cut staff. Hard decisions. But, like already mentioned, we have to stop what isn't working.

What about you? Does this look familiar? Use these calculations to figure out your net profit / loss. What's working for you? Look at profit versus production. What's happening to your equity? Remember, it's not what you make, it's what you keep.

So, as with the SSCA, there are rocky times ahead. We sincerely thank our major supporters for 2005 *(in-kind contributions denoted with an asterisk)*:

Partner: Ducks Unlimited Canada

Gold Sponsors: Saskatchewan Canola Development Commission; Farm World Equipment Ltd.*, Saskatchewan Agri-

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2006 Soil Conservation Awards Presented

On February 15th, the Saskatchewan Soil Conservation Association, in conjunction with the Royal Bank of Canada, presented its conservation awards at the 18th annual meeting, conference and trade show of the SSCA in Regina.

The SSCA annually presents the Award of Merit to an individual who has made an outstanding contribution toward soil conservation. This year's SSCA Award of Merit recipient is Stewart Brandt from Scott.

Edgar Hammermeister (left) and Ed Kellar, VP for Commercial & Agriculture for South Sask (right) present Stewart Brandt with the SSCA Award of Merit

Stu Brandt has been a researcher with the Saskatoon Research Centre at Scott since 1979 and the head of the Sustainable Land Management Section since 1998. His research has focused on developing and ensuring the adoption of tillage and cropping alternatives that reduce soil degradation, enhance economics, and improve soil quality.

Stu's work has been instrumental in developing and promoting the adoption of direct seeding and other forms of conservation tillage. For the last 12 years he has been the principal investigator on the Alternative Cropping Study, a research project examining the economic, resource preservation, and environmental effects of various crop rotations.

In 1997, Stu was a co-recipient of Agriculture & Agri-Food Canada's Ag Excellence Award for his work on reduced-bloat alfalfa, and in 2000 he received a Distinguished Agrologist Award from the Saskatchewan Institute of Agrologists. He is a member of both the Canadian and American Societies of Agronomy, and Chair of the Western Canadian Long Term Rotation Research Network.

The Royal Bank, in conjunction with the SSCA, annually recognizes a farm family that has made an outstanding contribution toward promoting production systems that reduce soil degradation yet maintain economic viability. This year the SSCA is pleased to present the Farm Family of the Year Award to Owen and Ruth Cairns of Coronach.

The Cairns began direct seeding some of their land along the Canada-US border in south central Saskatchewan in 1979. In 1984, Owen started continuous cropping two quarters and by 1992, the whole farm was continuously cropped and has been ever since.

This achievement was arrived at through both personal innovation and a commitment to keeping up with current agronomic research and development. Owen says that soil loss due to wind and water erosion has become negligible thanks to the changes they introduced to their farm business. Today they also operate Hillcrest Enterprises, a seed cleaning / special crop processing plant and retail farm chemical business. ●

Jim Halford (left) accepts the LB Thomson Award from Larry Lenton (right), Technical Director of the Prairie Central Region, PFRA

Edgar Hammermeister, SSCA President (left) and Ed Kellar, VP for Commercial & Agriculture for South Sask (right) present Ruth and Owen cairns with the SSCA Farm Family of the Year Ward

HARD REALITY AT THE CLC ... CONTINUED FROM PAGE 15

culture and Food*, Agriculture and Agri-Food Canada*

Silver Sponsors: BASF*, Syngenta*

Bronze Sponsors: Monsanto*, Bayer*, SaskEnergy, Moker & Thompson Implements*, Farm Credit Canada, Dow*, DuPont

*(For a full list of our supporters and project funding, please go to our website at **www.conservationlearningcentre.com**.)* ●

to the following website: http://www.gov.mb.ca/agriculture/soilwater/soilfert/fbd02s02.html.

Table 1. List of treatments used in study. Boxes marked with an "x" represent the actual treatments tested in the study.

N form	N management	Rate of N (lbs/ac)		
		27 - 36	53-71	80-107
Urea	Side band	x	x	x
	Mid row band	x	x	x
	Fall band		x	
	Spring broadcast		x	
	Side band with P seed-placed		x	
NH_3	Side band	x	x	x
	Mid row band	x	x	x
	Fall band		x	
Check (no N)	X			

Study Description: The first two issues can be answered with results from a study conducted over a three year period (2000 - 2002) at four locations in Saskatchewan (Indian Head, Star City, Scott and Swift Current). The study was coordinated by Dr. Reynald Lemke[3] of the Swift Current Research Center in collaboration with Gord Hultgreen of PAMI. A research drill owned by PAMI was used and consisted of 10 openers with a spacing of 10" between openers. When applying the side band treatments, a Flexi Coil Stealth[tm] single side band opener (www.flexicoil.com) was used. When applying the mid row band treatments, five Bourgault mid row banding discs (www.bourgault.com) were mounted on the frame of the drill between every second opener such that each row was never more than 5" away from the N fertilizer band. The same Stealth opener without the side band option was used for seeding when applying the mid row band treatments. At Scott and Swift Current, the three rates of N used were 27, 53 and 80 lbs/acre and at Indian Head and Star City, 36, 71 and 107 lbs/acre. Not all fertilizer placement and timings were done with the three rates of nitrogen. A complete listing of the actual treatments is provided in Table 1. For this article, we are interested in the treatments pertaining to mid row band and side band.

In discussing the relative merits of mid row band and side band, dry conditions would exacerbate the effects of the N management treatments on plant populations. Close examination reveals that in 7of the 12 site years, the month of May was very dry with precipitation ranging from 4 – 67% of long-term average across all sites and years. Therefore the conditions encountered during this study provided a very good evaluation of the relative merits of mid row banding and side banding of fertilizer N.

When it comes to plant populations, a minimum number of plants are required for each crop in order to achieve optimum seed yields for a given set of conditions. Table 2 lists some general recommendations for various crops. Based on numerous observations, we also make the assumption **that any two or more treatments that affect plant numbers by 15% or less usually don't have an effect on seed yield[11].**

Issue #1: Mid Row Band or Side Band: Effects on crop establishment

Spring wheat: Mid row banding established more plants in 4 of 12 site years and less plants in 1 of 12 years than side banding. When we remove those site years where there is less than 15% difference between the two treatments, we are left with two site years, Scott in 2002 and Indian in 2001 with the Indian Head site showing the greatest difference. Although the differences were important, it did not translate into an important effect on seed yield, as will be discussed later. Both of these specific site years corresponded to very dry months for May, i.e. 2 and 8% of long-term average.

Flax: Mid row banding established more plants in 4 of 12 site years than side banding. If we remove those site-years where there is less than 15% difference between the two treatments, we are left with one site-year, Indian Head in 2001. This corresponded to a very dry spring and like spring wheat, did not translate into higher seed yields, as will be shown later.

Canola: Mid row banding established more plants in 3 of 12 site years than side banding. If we remove those site-years where there is less than 15% difference between the two treatments, we are left with one site-year, Indian Head in 2001 showing an important difference. As noted above, this corresponded to a very dry month of May. As well, the side band treatments were seeded shallower than the mid row band treatment thereby biasing the results against the side band treatments. When this was combined with the dry spring conditions, the end result was essentially a delayed seeding effect. Plant counts were first taken June 12th. At that time, plant numbers for mid row banding were higher than for side banding. When the plant counts were re-done on July 3rd, after receiving some

Table 2. General recommended plant populations for various crops. These numbers would apply for all soils zones of Saskatchewan [5,6,7,8,9].

Crop	Plants per square meter	Plants per square foot
Spring, winter and durum wheat	200-250	19 - 23
Oat	200-250	19 – 23
Barley	150-200	14 – 19
Canola	> 40	> 4
Flax	300-400	28 - 37

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precipitation, we observed the same number of plants, 56 plants per meter square, for the side band and mid row band treatments. This means that seed / fertilizer separation was not the cause for reduced plant numbers. **We therefore conclude that the differences reported at Indian Head in 2001 were due to differences in seeding depth due to an error in equipment adjustment which in turn delayed crop emergence resulting in a seeding date effect rather than a N management effect.**

Issue #2: Mid Row Band or Side Band: Effects on seed yield

At Scott, in 2000 there were visible symptoms of N deficiency early in the growing season with the mid row band treatments that were not evident with side banding. These symptoms disappeared later in the growing season. There were indications that yield was affected [at P= 0.05 for canola , 0.10 for wheat and 0.08 for flax], with side band yielding 12% more for canola, 13% more with spring wheat and 7% more for flax. It should be noted that conditions were very dry after seeding, so it is possible that the mid row bands may have been stranded in dry soil. Soil available N was also very low, so the crop needed to access fertilizer N very early to avoid being deficient. Under these conditions, it may have been possible to improve performance by placing the mid row banded N deeper.

Although some differences in flax plant numbers were reported in favour of mid row banding over side banding, these differences did not translate into differences in seed yield. In fact no differences were observed between side band and mid row band for seed yield in flax except as noted above.

With canola, we observed higher seed yields for side band than mid row band in one site-year and the opposite in another year. The site-year that favoured side banding was at Scott in 2000. The site-year that favoured mid row band resulted in a 54% yield increase. It has to be noted, as discussed in the previous section for crop establishment, that the yield increase is due to an error in seeding depth between the two treatments. This resulted in a seeding date effect due to delayed emergence of the crop rather than between the effects of side banding and mid row banding given that the plant numbers were the same after receiving some rain. The 10 other tests had no differences in yield.

With spring wheat, we observed higher seed yields for side band than mid row band in 4 of the 12 site years and the opposite in one site year. The differences in favour of side band over mid row band ranged from 4-13% improvements in seed yield and 10% for the one site year where mid row was better than side band. The 7 other tests showed no yield difference.

Issue #3: Mid Row Band or Side Band: Is a 2" x 2" necessary to ensure safety of emerging seedlings to N fertilizer?

The authors are not aware of any bolt-on openers on the market today that can provide a minimum of 2" x 2" separation between seed and fertilizer i.e. the fertilizer is placed 2" to the side and 2" below the seed. We speculate that such an opener would cause excessive soil disturbance and possibly disrupt the quality of the seed bed resulting in negative effects on crop establishment and depending on the severity of the disruption, some possible reductions in yield.

In the previously discussed study above, the Flexi-Coil Stealth side band opener was used in the comparison with mid row banding. This particular opener has a 1" x 1" configuration. The mid row band configuration would place the fertilizer 5" to the side of the seed and 1-2" below the soil surface. According to the results discussed above, although some effects on plant numbers were noted in all crops between the two systems, there was no effect of these two configurations on seed yield in flax. With spring wheat, the side band configuration gave a small yield advantage over the mid row band system and with canola, one site year gave an advantage in favour of the side band while another gave the advantage to mid row band. However, as noted before, the advantage in favour of the mid row band in canola in one site year is confounded with the effect of shallow planting resulting in a seeding date effect rather than a fertilizer placement effect.

In order to shed more light on this issue, we refer to a study conducted at Indian Head in 1999 and 2000 where different rates of urea N (0, 53 and 107 lb N / acre) and potassium chloride were investigated in spring wheat and flax with a 1" x 1.5" and 1" x 3" configuration[4] using a Conserva Pak[tm] plot seeder with 12" row spacing (www.conservapak.com).

With flax, there was no difference in yield between the two placement configurations and when effects on plant numbers were noted, they favoured the 1" x 1.5" configuration rather than the 1" x 3" configuration. This can be explained by the higher seed bed disruption with the 1" x 3" configuration resulting in lower plant numbers.

In spring wheat, we observed better plant numbers in 3 of the 4 site years of testing with 1" x 1.5" configuration than the 1" x 3" configuration. Again, this can be explained by the greater disruption of the seed-bed with the 1" x 3" configuration. However, close examination of the actual plant numbers shows that even though lower numbers were observed with the 1" x 3" configuration, the numbers still exceeded the minimum recommended plant populations of 200 -250 plants per square meter. With seed yield, we noted that in 2 of the 4 site-years, the yield was greater with the 1"x 3" configuration with an overall advantage of 6% and in 1 of 4 site-years, the 1" x 1.5" configuration was better with an yield advantage of 8%. Overall, the yield differences in spring wheat between the two configurations were small (<5%) in favour of the 1" x 3" configuration.

In another study, urea and anhydrous ammonia N were compared in a one-pass seeding and fertilizing system at different rates of N up to 100 lb / acre in spring wheat and canola. These trials were conducted with a Conserva Pak[tm] plot seeder on 12" spacing using a 0.75-1" x 2-2.5" configuration and at locations with soil textures varying from 16-

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66% clay content[10]. Differences in plant numbers between urea and ammonia, when present, were less than 15% in spring wheat and no effect on seed yield observed. In canola, only one site showed a reduction in plant numbers greater than 15% but had no effect on seed yield. The only site showing a reduction in seed yield in canola due to ammonia did not show a difference in plant numbers. The wet soil conditions combined with the high clay content (52%) resulted in losses of ammonia to the atmosphere explaining the lower seed yields.

Conclusions

In regards to crop establishment, differences greater than 15% in favour of mid row band over side band were only observed in one site-year for flax and that difference did not translate into a yield difference.

In canola, only one site-year showed a difference in plant populations greater than 15% in favour of mid row band and it did translate into a yield difference. However, this was the Indian Head site in 2001 and as discussed at length in the article, the effects on seed yield are related to a seeding issue, i.e. experimental error because the side banding treatment was seeded too shallow relative to the mid row banding treatment resulting in a delayed seeding effect rather than an effect due to N management. In another site year, Scott 2000 side band yielded 12% more than mid row band (24 vs 21 bu / acre) even though the plant populations were greater for mid row band.

With spring wheat, there were two site-years where differences in plant populations exceeded 15% in favour of mid row band - Indian Head 2001 and Scott 2002. However for Indian Head 2001, it did not have an effect on yield. Scott 2002 showed a better yield for side band than mid row band but the overall yield levels were very low (3 bu / acre vs 2 bu / acre) and therefore not agronomically important. Overall, side band yielded greater than mid row band in 4 of 12 site-years and mid row band yield more than side band in 1 of 12 site-years. **One could argue in favour of side band but we conclude that the differences are not large enough to warrant concern.**

With the issue concerning the minimum separation between seed and fertilizer, although we can't refer to precise studies measuring different configurations, we can draw on some studies that can provide us with some important clues as to whether 1" x 1" is adequate separation. The results from the studies presented indicate that a 1" x 1" separation can provide enough safety in terms of crop establishment and seed yield over a wide range of N rates and N forms providing this separation is maintained under a wide range of soil types and moisture conditions. Care has to be taken to ensure that opener wear does not compromise this separation and careful attentions to soil factors like carbonate content and pH. Other factors like higher than normal seeding speeds, poor soil tilth, wet soil conditions and improper residue management, can compromise the separation of seed and fertilizer N. Under dry soil conditions and / or low soil fertility during the first few weeks after seeding, access to the N from the mid row band is limited due to the distance between the seed row and the nitrogen band. The concern is greater with wide seed row spacing.

From a practical perspective, we conclude that both systems of N fertilizer management are similar in terms of performance and offer excellent choices for the one pass seeding and fertilizing system.

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technical information to farmers on all facets of this crop management system.

Edgar Hammermeister, President of the SSCA said . "The loss of these agrologists is a blow to farmers across the province and the ag industry in general.**The SSCA Staff have been instrumental in influencing the adoption of a management system that benefits not only the province's soil but its water and air as well".**

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From the list below, it's evident that the papers cover a variety of topics. The first 20 of these are available from either the Staff or the SSCA website www.ssca.ca

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